VOLUME I

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

- x

Honeywell, Inc.,

Plaintiff,

-vs-

Sperry Rand Corporation and Illinois Scientific Developments, Inc.,

Defendants.

4-67 Civ. 138

- x

Deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 10:30 o'clock A.M., November 11, 1968.

APPEARANCES:

DORSEY, MARQUART, WINDHORST, WEST & HALLADAY,
by Henry Halladay, Esq.,
and
BAIR, FREEMAN AND MOLINARE,
by D. D. Allegretti, Esq.,
Attorneys for Plaintiff.

Laurence B. Dodds, Esq.;
John P. Dority, Esq.;
and
CHADBOURNE, PARKE, WHITESIDE & WOLFF,
by Zachary Shimer, Esq.,
Attorneys for Defendants,
and

DAWSON, TILTON, FALLON & LUNGMUS,
by Jerome F. Fallon, Esq.,
Attorney for the Witness.

* * *

From beginning Thru Watson Thesis

MR. HALLADAY: On the record. This is a deposition of Dr. John Atanasoff taken pursuant to notice, and for the record, I am Henry Halladay, one of the attorneys for the plaintiff. While we were off the record, Mr. Dodds, we had considered the fact that we had equipment in the room for closed circuit television video tape recording of the witness as he testifies, and I had asked that you consider the potential utility of this as a supplementary record of the deposition. I had said to you that this was the first time I had brought this up to you and had explained the reasons why I had said nothing about this previously, the theory being that you could not really consider the problem until you had seen the problem. I intend to continue with the deposition using the convention process that is required by the Rules, but also to have the video tape recording made so that all of us can, and when I say all of us, I mean those present in the room who will be in due time identified for the record, all of us can consider whether or not this supplement is an aid or is not an aid, whether it might conceivably assist the Judge in his consideration of the issues or whether it might not.

I am seeking, therefore, no concession

from anybody at this time except to consent to participate in the further proceedings on a without prejudice basis.

MR. DODDS: I am Mr. Dodds, speaking for defendants and, again, as explained during a prior informal discussion off the record, defendants object to the use of the video tape equipment on the grounds being raised, in part, on the basis of surprise, that we have not had an opportunity to consider the possible effect of it, and I would not want to make a snap decision with respect to it. As Mr. Halladay has suggested, there is, of course, no provision in the Federal Rules for the use of such equipment; therefore, we do object to its use and reserve objection also to its subsequent offering for any purpose. We will, however, reserving those objections, participate in the deposition of Dr. Atanasoff.

MR. HALLADAY: Mr. Reporter, perhaps we should have the appearances and persons present identified for your record. I have already said that I am Henry Halladay of Dorsey, Marquart, Windhorst, West & Halladay, attorneys for plaintiffs, and with me is Mr. Allegretti.

MR. ALLEGRETTI: Dmitri Allegretti,

Bair, Freeman & Molinare, Chicago, Illinois, for Plaintiff Honeywell.

MR. HALLADAY: Continuing around the table, Mr. Dodds, would you care to go next?

MR. DODDS: Laurence B. Dodds, counsel for defendants, and associated with me is Mr. John P. Dority, of the Univac Division of Sperry Rand and Mr. Zachary Shimer.

MR. SHIMER: Chadbourne, Parke, Whiteside & Wolf of New York City.

MR. HALLADAY: We have present the witness and whether a record should be made of the presence of another party I leave up to that other party.

MR. FALLON: I am Jerome F. Fallon, Dawson, Tilton, Fallon & Lungmus of Chicago representing Dr. Atanasoff as his personal attorney.

MR. HALLADAY: Of course we have present Dr. Atanasoff.

MR. DODDS: I think also we should have on the record the presence of and identification of Mr. Rice.

MR. HALLADAY: All right. We have also present Mr. LeRoy Rice, trademark counsel of Honeywell who is present solely for the purpose of assisting

in the monitoring and use of the closed circuit television equipment.

I think probably also the record should reflect that the television camera is situated at the end of the table with its lens beamed directly on the face of the witness, that in the middle of the table is a table microphone which I hope is operative and is picking up all of us. Around the witness' neck is a so-called lavaliere microphone, and I just discovered on top of the table is another microphone which I assume is that belonging to Mr. Anderson, the court reporter, who appears to have a supplemental aid of his own in the form of a tape recorder in a briefcase. So we have a variety of methods presently being employed to record these proceedings.

It is my purpose, as I said off the record, not to permit the television process to interfere or interrupt the normal process, and if some problem develops with it, we will continue unless it is convenient and agreeable at the time that we suspend while we solve whatever the problem may be. I don't intend personally to have this supplement in any way interfere with what all of us as lawyers are accustomed to in the process of taking depositions.

MR. DODDS: I assume we can have an

understanding that this recording will not be used in any way for publicity purposes?

MR. HALLADAY: Definitely. It may be so understood and I assume that Mr.Fallon, you will agree likewise?

MR. FALLON: All right.

MR. HALLADAY: Now, I don't know if the witness has been sworn.

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Whereupon,

DR. JOHN V. ATANASOFF,

a witness called by the plaintiff, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HALLADAY:

Q Will you identify yourself for the record, please?

A I am John Vincent Atanasoff, resident of Maryland, actually reside near a town by the name of Newmarket. My mailing address is P.O.Box 503 Frederick, Maryland.

Q How old are you?

A I am 65 years old.

Q Dr. Atanasoff, will you state your business or profession?

A I am at present retired. During the years of my active life I have been successively college professor, government employee, private entrepreneur, vice-president of Aero Jet General, this being a business activity, and I would like to remember that I am a theoretical physicist.

Q Now, you know that we are engaged in doing what is known among lawyers as taking your deposition. You understand that?

A I do.

Q And you also understand that we are doing so in a private conference room whereas if you were testifying in court

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you would be in an open courtroom?

A I do.

Q So that I would like you to the maximum extent that you can, to try to be as if you were in some kind of a public facility such as you might have had as a teacher or as a lecturer so that you will keep your voice up and make yourself as plain as you possibly can so that all of us in the room can be sure to hear what you have to say. Will you do that?

A I will. I will try. If you don't hear me raise your hand and I will speak a little louder.

Q Now, lawyers are not necessarily accustomed to raising their hands. They are more likely to say something.

A Very good. Very good.

Q And another thing that many of us notice about witnesses is when they are expressing agreement or disagreement they may well shake their heads or nod them which does not necessarily tell the court reporter here what they are doing since he can't be expected to keep an eye on everybody. So if you would be good enough, please, to keep your answers audible?

A I will.

Q Thank you. Can you give us -- by the way, is it customary to talk to you as Dr. Atanasoff or are you usually called Mr., and I am not speaking by people who are familiar enough with you to call you by your first name?

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A In my professional life I am generally known as Doctor. Otherwise it doesn't matter at all.

Q Can you give us a brief but reasonably full capsule statement of your life?

A Well, I was born in Hamilton, New York October 4, 1903. When I was a youngster my family moved to West Eaton, later Deerfield near Utica; later New Jersey, later in Florida, moving to Florida at, when I was eight. My father was an electrical engineer for a phosphate company during a period there, and I had begun school in New Jersey, continued it in two towns in Florida, first Osteen and later Brewster, then a little town by the name of Chicora, again Brewster and then for the last two years of high school to a town by the name of Mulberry in the state of Florida.

I graduated from Mulberry High School in the year 1920, in the spring of 1920, and I found it necessary to work a year before I went to college and entered the University of Florida in the fall of 1921, attended the University of Florida for four consecutive years and then started graduate work in mathematics at Iowa State University in the fall of 1925, later getting a Master's Degree and studying further, and later I went to the University of Wisconsin and got a Ph.D. there in the year 1930.

I returned to Iowa State College as an assistant professor, later associate professor, and after I had left the

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University of Florida in '42, in absentia I was made a full professor.

Q I think you said after you left the University of Florida?

A I am sorry.

Q In '42?

A Correction, correction, Iowa State University. I was made a full professor in absentia.

Now, I left the Iowa State University in 1942 and went to the Naval Ordnance Laboratory, worked with the Naval Ordnance Laboratory until perhaps, I am a little uncertain, '49, and I then became scientific advisor to the Chief of Army Field Forces. I went back, I was there a year and a half and then I went back to the Naval Ordnance Laboratory as assistant technical director for fuses. I was in this position, I was in charge of the Navy's fuse program.

In 1952, I left the government employment and started a company of my own called the Ordnance Engineering Corporation.

In 1956, this corporation was sold to Aero Jet, we were joined as a division of Aero Jet and later I became a vice-president of Aero Jet, Aero Jet General Corporation. It's a subsidiary of General Tire and Rubber, a rather large West Coast corporation with principal offices in Akron, Ohio though, I believe.

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I worked with Aero Jet General until 1961 when I resigned. Since then I have occupied myself to some extent with consulting work, but in the main I have pursued my own ideas and designs.

Q You are here testifying as a witness in the case brought by Honeywell against Sperry Rand Corporation and Illinois Scientific Developments, Inc., at least in its present posture that's correct, isn't it?

A I believe so. Yes.

Q And I gather that you have engaged in some preparation for the purpose of so testifying?

A I have so engaged.

Q Now, can you tell us about how long you have been engaged in work which in one way or another has led up to testifying, and I don't mean by that the work about which you are going to testify, but the work which you have been doing which in effect has led up to the fact of testifying?

A I have been working along these lines for 17 or 18 months.

Q In the process of that, can you tell the Court, and you understand the Court isn't here, but I may periodically say tell the Court because it may be that by your deposition this will be the effect of it.

A I understand.

Q Will you tell the Court what has been the nature of

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this preparatory work?

A In the first place, I drew, I examined my files, many of my files have been in my possession for many years without much in the way of maintenance, and I separated the files so that I had available the material which I considered relevant to this case. It's obvious that this decision may be imperfect.

I collated and reread and examined this material and used it to refresh my memory. I have spent a great deal of time consulting with counsel, those present and others. I have had visits at my home from counsel including counsel for the defendant.

Q And, incidentally, from time to time you have the habit that many of us have, of masking your mouth with your hand which is perfectly understandable and as you are now resting your chin on your hands which has the tendency, at least, to mask the words.

A You see I haven't had training in staging such an event. I don't think there will be much hamming, looking at your serious face, I am not inclined to ham.

Q Well, I wasn't thinking about that as much as I was about the reporter being able to get your words and not being able to if you have got your hand over your mouth. So try, if you can, to keep your hands away from your mouth, not because of the camera but because of Mr. Anderson here and the

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rest of us. Okay? Okay?

A You want me to say yes?

Q I do.

A I will.

Q Unless you disagree?

A I don't disagree in the slightest. You are giving me directions and I thought they were in order of commands but--

Q All right. Now, have you at least in a general way given us a basis to understand the preparatory work that you have engaged in?

A I have given a general outline, I believe. This work includes other items which I can describe. I have gone systematically through the logic, through the theoretical logic of the computer machine which is about to be described. I have also done experimental work in these lines so I am immediately fairly familiar with the details. You are never thoroughly familiar but fairly familiar with those details.

Q And have you in addition to talking to counsel for the plaintiff, I think you said you talked to counsel for the defendant?

A I did.

Q Have you talked to other people?

A A great many other people.

Q And your purpose in doing that has been what, Dr. Atanasoff?

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A My purpose in every case was to place me in the atmosphere of the day and help to refresh my memory in regard to what actually happened at that time.

Q Now, in your capacity here, have you had an arrangement which has provided for compensation for you in these efforts you have described?

A I have.

Q And with whom was that compensation arrangement made?

A It was made with the firm of Mr. Halladay.

Q And specifically with my firm on behalf of what organization?

A I am sure that this was on behalf of Honeywell.

Q And in that respect, have you been compensated for your services to date?

A I have been so compensated.

Q Can you give us an estimate as to the amount of such compensation which you have received to date?

A I do not have at hand a good estimate of compensation which has been so received. If you say $50,000 you will be close to the amount of compensation.

Q Now, has your compensation in any way been so arranged as to be contingent upon the outcome of the lawsuit that I have heretofore described?

A No, sir.

Q Has the compensation been on a per hour or per diem

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or a fixed fee or how would you describe it?

A It was on a per diem basis.

Q Did it also include reimbursing you for expenses necessarily incurred and properly vouchered and detailed?

A It did.

Q And have you in receiving the compensation or reimbursement for expenses submitted a detailed itemization of the days or parts of days upon which you have expended time in the activities which you have heretofore described?

A I have so done.

Q Now, in the process of examining your files which you have said you have done, can you give the Court some understanding of where you had these files and what you did about assembling them, collating them, digesting them, reading them and things of that sort, please?

A Well, at the beginning, these files were at Iowa State University. When I left the Iowa State University in September of 1942, the files were not immediately shipped to me, but they were later shipped to me. They have been in my general custody, if not my immediate custody, ever since that time. These were files which I knew were there, and which I did not refer to, and the extent of these files I did not know during the period, during this long period which has passed. However, they were safely in my custody and they were found when I looked for them.

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Q And physically speaking, where were they found?

A They were found in a file cabinet and in boxes stored in my house.

Q And your house is situated specifically where?

A One mile east of Newmarket, Maryland on Highway 40.

Q And is that U.S. or state highway?

A That is U.S. Highway 40.

Q In the state --

A Now known as -- now also known as 70N.

Q On the interstate system? Now you are nodding your head.

A I am nodding my head. Yes.

Q Meaning?

A Meaning yes.

Q How long have you occupied that residence?

A Perhaps five years.

Q During that time have these files that you have described been situated there?

A They have.

Q Now, have you in any way in collecting the files that you have mentioned supplemented them by obtaining documents, data or information from other or outside sources?

A I have.

Q And will you describe in a general way at least what you have done to supplement the files which you had in your

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immediate possession?

A Of course I have -- I have accepted from each person to whom I talked any definite material dating upon these years which are in question. For instance, my co-worker during the period of the construction of the computer machine which is the subject of concern here was Mr. Clifford Berry who lived in, after he left Ames, lived in the Pasadena region after he left Ames and for many years he resided in Altadena, California. I visited -- Clifford Berry's dead, he died in 1963 -- I visited his home, his former home and his widow and we went through his files as far as we could, and on another occasion the widow went through his files as well as she could and added certain items, and I also obtained photographs in this case. I remember one photograph that was obtained from Mr. Norman Fulmer, Mr. Norman Fulmer who is an employee of General Electrical Corporation as a patent counsel and who, as a matter of fact, told me, and then I remembered --

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Q Let's not get into hearsay.

A Well, after he had refreshed my memory, I remembered well that he had worked for me in the course of the construction of this machine.

Q And you obtained what from him?

A From him I obtained a photograph of Clifford Berry standing by the machine which he had taken personally in those years.

Q Now, you brought this file or these files so assembled physically here?

A I have so.

Q Are they physically present right now?

A They are physically present.

Q In this room?

A They are physically present right now.

Q Now, have you organized those files in such a way that they have some kind of an order so that one can go from place to place in the files according to some system?

A I have.

Q Will you describe that system for us, please?

A Well, we have a rough classification according to subject matter and the gross subjects are classified A, B, C and D, and under this we have employed numerals 1 up, I don't know how far they go, and the files are arranged in this way. In addition to this system, I have imprinted on

each item of these files a number with a numbering machine starting from one upwards, but not necessarily employing all integers because it was more convenient to skip integers in that enumeration and each item in my files can be so identified by the number, the numerical sequence which I have appended to it.

Q In other words, you started numbering documents with one and went on sequentially thereafter but not uninterruptedly toward the highest number?

A That is correct.

Q Now, the interruptions are the interruptions subject to any particular rationale or explanation or do they happen randomly or how would you describe it?

A In the course of organizing files, it sometimes -- you have to start again and it seemed logical to start again. These subjects, I have a list of the numbers which have been employed and can identify such numbers. However, I will have to use references for that purpose. I cannot identify them from mind. There is, if a number is missing, it does not mean a document is missing although it may mean that.

Q And have you made up a listing of these documents in your files by chronology and as well by numerical sequence?

A I have.

Q Now, I would like to discuss with you the question of these files, the documents that you have brought with you

are whose property?

A They are my personal property.

Q And can you give us an idea of the general physical contents of the files? Are they -- you mentioned photographs, for example, but are there other kinds of pieces of paper?

A There are.

Q Would you tell us what kinds of pieces of paper we are dealing with in your files?

A I will attempt to summarize the nature of the files. There are my handwritten notes, in some cases they are letters written, carbon copies of letters written by me and letters received by me.

There are technical expositions and descriptions of my work on a computing machine and during the time of working on the computing machine there were two -- there was a manuscript prepared outlining the character of the machine, and I have two of the original manuscripts prepared in that day among my files. I have photographs. I have material which was prepared for patent specification. I have photographs which were prepared for patent drawings as of that day. I have photographs of the machine during the course of its construction, some cases exact date of these photographs can be given and in other cases it cannot. I cannot think of other material which I wish to add.

Q Dr. Atanasoff, this is an aside, what's the state of

your health?

A I feel pretty well even this morning.

Q Is there any particular routine that you would like to see followed in connection with your testifying as to the timing of a break, the length of a break, activity that would be permitted of you during the break that you would like to tell us about so we could all consider it?

A Well, I don't want to sit in a chair in one place too long because I don't think it's good for a man. I would like to have a reasonable number of hours in a day, and I won't be too sensitive about this, and I would like to have a break in the middle of morning span and a break in the middle of the afternoon span so I can stretch my legs and get a little walk and get my blood circulating again, and I would like a reasonably leisurely lunch hour. Other than that I have no desires.

MR. HALLADAY: We had planned to convene at 10:00 o'clock, Mr. Dodds, do you want to convene each morning at 10:00 or would it be agreeable to you if we started earlier if the witness and we are agreeable?

MR. DODDS: I am agreeable to starting earlier if the witness is agreeable.

MR. HALLADAY: Would it be all right to start at 9:00 o'clock in the morning, Mr. Atanasoff?

THE WITNESS: Yes.

MR. HALLADAY: All right with you, Mr. Fallon?

MR. FALLON: Fine.

MR. HALLADAY: That will be agreeable with me, and then should we agree to run the usual court hours, that would run us until 12:30 with a break of 15 minutes about half way between 9:00 and 12:30. I am right on that, am I not, Mr. Anderson?

THE REPORTER: Yes.

MR. HALLADAY: We would reconvene at 2:00 o'clock and run until 5:00 or in the discretion of the judge, even later, but again with a break about half way in the afternoon session. Would it be agreeable to all of us if we duplicate within these limits about what the court hours would be if we were in court?

MR. DODDS: Satisfactory to defendants.

BY MR. HALLADAY:

Q Sound all right to you?

A Satisfactory with me.

MR. DODDS: Off the record.

(Discussion off the record.)

MR. HALLADAY: Well, then, it is a few minutes after 11:00, and it would be agreeable with me

if it is with everybody else that we take this occasion for the first break.

MR. DODDS: Agreeable.

(Recess taken.)

MR. HALLADAY: On the record.

While off the record we have been discussing the question of Dr. Atanasoff's files that he has brought with him, and I have proposed in view of a position stated by him to me with which I concur, of the necessity for preserving the integrity of the originals for his purposes, that we go at this file question and exhibit identification in this fashion: His files have been put into Manila file folders which have been given alphabetical identifications and subnumbers for the files themselves, that is to say, the Manila folders under the alphabetical designation such as A, A-1, A-2, and I am saying this for illustration, not because it necessarily is precisely that way , we on't know that until we actually have them on top of the table before us. Inside each such Manila file folder, and there may be envelopes involved, are documents which have been numbered. The numbering system has already been described by Dr. Atanasoff so that for illustration, file No. A-1 may include documents No. 1, 3, 27 and 1400, just for illustration, but one can tell as a result of this what file A-1 contains by

serial number.

And I propose that the original file folders brought here by Dr. Atanasoff be themselves marked with an exhibit identification corresponding to the existing alphabetical and/or numerical identification of the file folder proper with the documents contained in the file folder referred to for exhibit purposes by their existing numerical designation.

We have prepared in advance what we hope are identical Manila file folders which will, when produced here, be identified as duplicate exhibits, for instance, if an original file folder is marked Atanasoff Deposition Exhibit A-1 which is the designation I was using purely for illustration, we would mark the duplicate file folder Atanasoff Duplicate Deposition Exhibit A-1 or Atanasoff Deposition Duplicate Exhibit A-1, whatever the nomenclature seems best.

Inside of that duplicate exhibit, we have and would intend to include documents serially numbered exactly equivalent to the serial numbers appearing in the original of the file folder marked Atanasoff Deposition Exhibit A-1, with the understanding being that the duplicate exhibits and Xerox copies included in the file folder so marked be treated as court exhibits, and I have said prior to getting on the

record, that we have already prepared a set of such exhibits prepared in this fashion for use of counsel for the defendants.

It would, under these arrangements, be the understanding that the original exhibits consisting of the file folders so marked and the original documents identified with the original numbering system which has been done by Dr. Atanasoff either through the use of a numbering machine or in some instances by handwriting or hand numbering, those original files would be returned to his custody for permanent preservation so far as this lawsuit is concerned, at least, and for such other permanent preservation as it may be his wish, with the understanding in which I believe he and his counsel concur, that at all reasonable times during the pendency of this lawsuit arrangements can be made for suitable inspection of the retained original documents by counsel for the respective parties, and in the event that there should be some reason, therefore, for an opportunity to be extended to the Court to examine such original documents, if any reason therefor should appear.

Now, I have said what I have said in the hope that it is stated in such a fashion that it finds

agreement around the table.

MR. DODDS: Counsel for defendant agrees.

MR. FALLON: On behalf of Dr. Atanasoff I agree.

MR. HALLADAY: And just so there is no possible misunderstanding, Dr. Atanasoff, have you followed me and does this sound acceptable to you?

THE WITNESS: Yes. Providing that in a subsequent use of such documents they are not injured or destroyed.

MR. HALLADAY: All right.

MR. DODDS: I am sorry. I didn't hear that.

THE WITNESS: I will try to speak louder, Mr. Dodds. I agree with the reservation but that in such subsequent use they not be injured, defaced or destroyed.

MR. HALLADAY: And certainly that was implicit in what I was saying.

THE WITNESS: I am sure it was. I am sure it was.

MR. HALLADAY: Then I suggest that since the reporter can only do one thing at a time, we go off the record and have Dr. Atanasoff produce

his file and then have it marked in the fashion that I have stated. We can then compare his documents with the copies to be sure that we have included what we need to and included nothing that we should not so before that point, Dr. Atanasoff, would you bring your satchel, or have your lawyer or tell me where it is and let's get it up here in front of us.

THE WITNESS: I can do it, I guess.

MR. HALLADAY: And would youplease remove the contents and place them on the table before us?

(The witness complies.)

MR. HALLADAY: Now, would you dispose of the luggage and let's get the files assembled in front of you and in some fashion where it will be reasonably easy to refer to them and then in turn to ask the reporter to go through them and mark them along the lines that we have agreed here.

For the record, may I just attempt to describe the physical arrangement that we have before us. There are a set of file folders that are presently tied together with red string. Now, can you tell us generally what that first bundle is intended to include?

THE WITNESS: I would rather have my key in my hand if I am attempting to do this. I can untie them and look at them and tell you.

BY MR. HALLADAY:

Q I am trying to find out if there is some particular reason for having them bundled in that fashion?

A There is no. No. It's a physical requirement.

Q You made convenient bundles?

A It will go in the suitcase, that's why.

Q All right. That's all I'm trying to find out. Is that true with respect to the rest of them, they are bundled?

A It is. That's right.

Q In a fashion simply convenient for carrying them around?

A Yes.

Q All right.

MR. HALLADAY: Then may it be understood we will now go off the record and ask the court reporter to mark them and when we have gone back on the record we can arrange to have the system of marking then identified.

MR. DODDS: All right.

(Whereupon several file folders were marked as Atanasoff Deposition Exhibits A-1 through Atanasoff Deposition Exhibit I.)

(Whereupon a recess was taken until 2:00 o'clock P.M., November 11, 1968.)

November 11, 1968
2:00 o'clock p.m.

(Appearances as heretofore noted.)

MR. HALLADAY: Let's go forward with the old-fashioned way and if the so-called new-fashioned gadget gives us help we can find that out in due time.

Mr. Anderson, would you mark this, please, as Atanasoff Deposition Exhibit J.

(Atanasoff Deposition Exhibit J marked for identification.)

MR. HALLADAY: May the record show I have given a copy of what has just been marked Atanasoff Deposition Exhibit J to counsel for the defense.

BY MR. HALLADAY:

Q Will you look at Exhibit J, Dr. Atanasoff, and tell me, this is frankly leading, if that is, in effect, an outline type of index to the contents of the files which you have heretofore produced and which have heretofore been marked by the court reporter as Atanasoff Deposition Exhibits A, B, C, D, E, F, G and H?

A It is. I might make a further remark for sake of clarity. It will be noted that this is not exactly the same as another document that is located in files A-1, it's a slight revision of it, and you should substitute this for the one

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that is in A-1 and which has one or two items which are not included here.

Q Well, we will get to that when we get inside of these files. I simply wanted to have a listing that had been prepared for the special purpose of making it as easy as possible to locate by alphabetical exhibit identification the folders in your files and I take it that's the purpose of this Exhibit J?

A It is.

Q Along with the subcontents of the alphabetically identified files by first numeral such as A-1, 2, 3 and succeeding that, serial numerals from quadruple zero, meaning zero, and triple zero one meaning one, et sequitor, through the numerals that were in fact employed in serially numbering documents in the manila folders.

Now, that's a long involved and basically leading question, but have I stated at least with some fidelity about what this is?

A I believe you are absolutely right.

Q All right.

MR. HALLADAY: For the record, Mr. Dodds, Atanasoff Deposition Exhibit J is not intended as anything more than what it purports to be, namely, what we hope will be a help in finding documents included in Dr. Atanasoff's files. The original of Atanasoff

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Deposition Exhibit J I am going to leave with the court reporter for inclusion in the original transcript.

BY MR. HALLADAY:

Q Now, I have also discovered, Dr. Atanasoff, and gentlemen, that in our efforts to make completely identical copies of Dr. Atanasoff's files that have now been marked, we had not completely succeeded and let me illustrate what I am saying so you understand why I am leaving off where we were and going to a different frame of reference.

Included in Dr. Atanasoff's original files are, for illustration, certain negatives of photographs. Those negatives are of two kinds, and in using the plural, don't hold me to the plural. One kind of negative is a negative which was obtained as a negative under circumstances to be described by Dr. Atanasoff. Another kind of negative is a negative obtained by Dr. Atanasoff from a positive print.

In reproducing the files, obviously we have had some difficulty in reproducing a film negative at all while preserving the integrity of his file in the process. Therefore, the reproduced file at this time I would not wish to represent to you would be 100 percent faithful to the order or appearance of the documents in Dr. Atanasoff's file, and until my associates and I have satisfied ourselves that we do have 100 percent fidelity, I don't want to go much further in attempting to correlate the original file with the attempt at

4, K-15

(H)

completely duplicating it.

MR. DODDS: Do I understand you correctly that the duplicate file may include, say, a positive print of an item of which the negative film is found in Dr. Atanasoff's original file?

MR. HALLADAY: It should include both.

MR. DODDS: Oh.

MR. HALLADAY: But for clarity for the purposes of possible future reference, I would not want the file which you have as a copy nor the court file which it would have as a copy to have a positive print in it when in fact Dr. Atanasoff's original file had a negative as well as a print. So to be certain that we have the duplication process totally straightened out we are visibly engaged in rechecking it and will at some time, I hope before the close of the day, tender it to you subject to human fallibility as nearly as possibly perfect.

BY MR. HALLADAY:

Q Dr. Atanasoff, I am turning now from more formal matters such as attempts to identify and properly label files for preservation, and please accept my assurance that we have not deviated from the arrangement that your original files will be maintained according to the standards we have established, and I am going to turn your attention to other matters.

#4, K-16
(5)

You have said that you are, I think -- I think you have said, a physicist?

A Theoretical physicist.

Q I didn't hear that?

A A theoretical physicist.

Q A theoretical physicist. Would you for the benefit of the Court give us some kind of a short but reasonable explanatory description of what it means to be a theoretical physicist?

A A theoretical physicist is a man --

Q You are dropping your voice.

A Yes. I will get it. I have got plenty of voice. A theoretical physicist is a man that a physicist calls a mathematician and a mathematician calls a physicist, a man somewheres in between, and a man that doesn't usually in the normal course of his activities do experiments except armchair ones. Now, an armchair experiment is one you can do in a chair without any laboratory apparatus. It means it's some kind of mental ratiocinations, and this is what theoretical physics is about. It has to do with a concept of physics which is basic and theoretical and mathematical in character and most everything you want to find out you find out by thinking and not by doing.

Q When you say you, you mean if you are a theoretical physicist?

#4, K-17
6

A I mean that. Yes.

Q Now, directing your attention to this general frame of reference, how long have you been interested in such matters?

A Well, if you speak of such matters broadly, since 1913.

Q At which time you would have been what age?

A Ten years old.

Q Have you had occasion to attempt to discern what your earliest memory is, Dr. Atanasoff?

A Of my entire life do you mean?

Q Yes.

A Yes, I have.

Q Have you ever had an occasion to attempt to discover that before you became involved as a possible witness in this lawsuit?

A I never did. No, sir.

Q After becoming involved in your capacity in connection with this lawsuit, have you been pressed with respect to your memory?

A I don't want to quip, press is a rather moderate word.

Q I beg your pardon?

A I do not wish to quip but press is a moderate word for this state of affairs.

4-7-18

Q Well, in the course of preparing yourself to give evidence, have you attempted to define and delineate and be able to recall everything that might be considered to be relevant to the problems at hand?

A I have so tried. Yes, I have.

Q And a good many things that may have been irrelevant?

A Yes, sir.

Q Do you have a way of attempting to fix how old you were when you have your very first recallable memory?

A Yes. There is a very good, a very good fix on that memory. I was two years and five months old. I remember the birth of my sister, and we know when her birthday is by permanent records, and so I was -- so I am able to recall that event.

Q You have told us where you were born. Where was this that your sister was born?

A Seven miles away in a town called West Eaton.

Q West Eaton. What state?

A New York.

Q After that does your memory tell you where you lived? Where you moved to? What kind of schools you went to, things of that sort?

A Yes. Fairly well.

Q Where did you go to grade school?

A I went to grade school first in Kingsland, New Jersey.

Q Then where?

A Then Osteen, Florida and then Brewster, Florida, and then Chicora, Florida and then Brewster, Florida, then Mulberry, Florida.

Q Did you go to grade school in Mulberry, Florida?

A No. I went to high school in Mulberry, Florida.

Q Having in mind your entrance into grade school, can you tell the Court something about, if you can recall, when you began to read?

A Well, my parents were interested in me because they didn't have too many children and they commenced teaching me and so perhaps at the year of, somewhat before I went to school, I was reading a few words.

Q You say your parents didn't have too many children?

A They had two at that time.

Q How many children did they have altogether?

A Altogether I am the oldest of ten children, eight of whom survived.

Q Do you have any memory now of anything in particular that you read before you ever went to school at all?

A I have no such memory.

Q After you entered grade school, do you recall anything about reading that comes to your mind now?

A I think not. I remember reading in -- I remember when I was in the second grade attempting to read the third

4-9-20

grade reader. That instance happens to occur to me, if you push me, but no open literature. By that I mean such as a newspaper. I wasn't reading newspapers in those days much.

Q As you then progressed until you got to be ten years old, can you recall and recount with any assurance what you were reading either in school or out of school?

A I remember when I was perhaps nine I was going to school at Osteen, and you know how it happens, this professor, it was a two-room school, and the professor had a lot of bother and one of his bothers was me, and he had to keep me entertained so he brought a book on scientific experiments to school, and I read that from cover to cover.

Q Do you remember the name of that book?

A I do not.

Q Do you remember what kind of scientific experiments were involved?

A Yes. They were chemistry and physics both.

Q Now, before that time had you, that you can recall, exhibited an interest in matters that were, for general purposes, would be called scientific?

A Well, my father was an electrical engineer, and he had a son, you see, and was kind of proud of him, and he wanted to teach me the rudiments of electricity and he proceeded; and before I was eight, why, I could connect up transformers and -- no, not transformers, let me correct

4-10-21

myself,-- dry cells and pushbuttons and buzzers and lights, and I knew the difference between series and parallel connections, it happens.

Q What can you tell us that would illustrate an existing knowledge of the difference between series and parallel connections in those early days of your life?

A Well, you see, I knew that to connect a cell with positive to negative and use of outside terminals was connecting them in series, and connecting positive to positive and negative to negative, that was parallel connection. I knew this and my dad and I would connect bells,both ways to see which would make it ring better.

Q Do you have a positive recollection of having engaged in such a thing?

A I positively do. Yes, sir.

Q Is there any way by which you can fix the date or year or place?

A Well, no.

Q Or place upon which this occurred?

A No. But I know where I was. I was in a second story room of a house which still exists in New Jersey, and I can show you the room, if they haven't torn the walls out inside, I can show you exactly which room and that was -- well, it was certainly before the termination of 1911.

Q And what place in New Jersey?

11-22

A The town at that time was said to be in Lyndhurst, but it was almost adjacent to Kingsland. It was on Second Street off Ridge Road near the present location of the DL&W, I think there is another name for the railroad.

MR. DODDS: The Delaware, Lackawanna and Western.

THE WITNESS: And perhaps nine miles out of New York City across the salt flats there, and not at present, and it's near the present location of the station but not the location of the station at that time. The station was a quarter of a mile different, in a different position at that time. But the house was standing at my last visit which was within the last three or four years.

BY MR. HALLADAY:

Q Did you visit the house within the last three or four years for the purpose of refreshing your memory along the lines of these questions?

A Not at all.

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Q Then when was it that you moved to Florida?

A In February of 1912, I believe.

Q At that time, what grade were you in?

A I was in the third grade, but, you see, just had finished part of the third grade.

Q By that time, Dr. Atanasoff, had your activities involved themselves in anything scientific beyond what you have already described for us?

A I wouldn't say so, no.

Q What about your reading by the time you had gone to Florida? What then were you reading?

A Well, you understand in this first place in Florida, was Osteen, and that's where the professor was that gave me a science book to read and I was able to read it all right. This was in -- not in -- it was in the fall of 1912 that I went to school there, not in the spring, but in the fall of 1912.

Q Had you been out of school for some period of time?

A I was out of school from February until June.

Q On what account?

A Oh, I had moved down there and it was difficult to get me into the school and my parents didn't think I would have any trouble one way or the other, they weren't much worried about it.

Q Well, then, thereafter, when you were about ten, what was it of a scientific character in which you involved yourself?

A Well, when I was ten my father had commenced to work for a phosphate mine in Polk County, Florida, at a place called Brewster.

Q That is P-o-l-k?

A P-o-l-k, yes, and he was an electrical engineer there, and having taken, having taken a new job, although he had a slide rule, he felt as if he should have a new slide rule.

Q Would you mind if we interrupted just for a moment?

(Recess taken.)

MR. HALLADAY: All right. On the record. Could we have, Mr. Anderson, where we were when the interruption came?

(The answer was read.)

BY MR. HALLADAY:

Q Now, Dr. Atanasoff, can you pick up where we were interrupted, and please have this in mind, that while we as lawyers may be interested in the department of fuller explanations, your questions ought to be tailored as nearly as possible to respond directly -- did I say your questions -- your answers should be tailored as nearly as possible to respond directly to the question.

A Will you repeat the question?

Q I fortunately have the assistance of a very able reporter, but the gist of it was to describe this early experience of yours that I have been pleased to denominate scientific in character, which you dated at about age ten. Does that give you the question?

A Now -- well, I am trying to please, and I am uncertain how to please, you know, being inexperienced in such matters, and there was -- we will continue and then if I still get too verbose, is that your suggestion, sir?

Q No. It wasn't a matter of verbosity. It was a matter of responsiveness.

A Am I on the subject now or not or am I -- something about the law that has escaped me and I am not on the subject when I am trying to be.

Q All right. Let me try to do it this way and perhaps it will shorten it, perhaps it won't. I hope I can aid your understanding.

A Yes. I am trying. You know that, Henry.

Q You had said earlier in a general way that at about age ten or in the year 1913, you had exhibited your first interest in a subject that fell within the framework of theoretical physics, or words to that purport, unless I misunderstood you.

A You did not misunderstand me except that there is

a qualification.

Q All right.

A I said if you speak about the subject broadly it occurred at this year, and you have to be moderately broad, I would say, to interpret this as scientific.

Q All right. Now, directing your attention to that particular incident or event, can you give the Court an understanding of what that event was?

A There are some words in the record about this. My father had two slide rules. One was an old K. & E., and another one was a Dietzgen. The Dietzgen came in a red case and I remember it as if it were yesterday, and I would hold that in my hand and love it, you know, and then I would look at it and I would say, "What's this about," and then I would hold it some more and then I started reading a book and pretty soon I could operate with it.

Q Which one?

A The new one, or the old one, either one. After I could do one I could do the other. They were just identical.

My dad didn't have much need for the slide rule. His work mostly consisted in supervising the installation of equipment and the like so they were left for my full attention, and I proceeded to use them and in a short order I had become entirely proficient with the slide rule except the trigonometric function.

Q Dr. Atanasoff, as of that time in your life, you say you became proficient in the use except in certain specific areas. To what use did you at that time put either of these slide rules?

A I worked every problem in multiplication that I would write down with a limited enough number of digits so it could be worked on a slide rule, or I worked the numbers in the instruction book for the slide rule, the Dietzgen. I didn't have an instruction book for the K. & E.

Q You have used the term, and this will happen as we go along from time to time, you used the term K. & E.?

A Kueffle & Esser, I believe it is. It's one of the large manufacturers of drawing instruments and engineering appurtenances like slide rules.

Q You understand the reason for my interruption is because of this gentleman here who is trying to take it down.

A Get it on the record.

Q When you say K. & E., you meant the letter K and the letter or the figure or the word and, and the letter E?

MR. DODDS: No, K. & E., Keuffel & Esser, is it not?

THE WITNESS: Mr. Dodds, may I have your help in spelling these words? I am not sure.

BY MR. HALLADAY:

Q I wasn't going to quarrel whether it was K. &

E. or K and the word "and" spelled out, and E.

A K-u-f-f-e-r?

MR. DODDS: K-u-e-f-f-e-l.

THE WITNESS: Right. So right. I bet you could do it.

BY MR. HALLADAY:

Q These interruptions are necessary from time to time and I hope you will bear with me.

A They don't worry me.

Q As of that time, again in this broad and general area of definition of things scientific that relate in some way to physics or theoretical physics, can you describe for the Court any other interests or manifestations which you had?

A You mean leaving the slide rule?

Q Leaving the slide rule.

A All right. Yes. I commenced to gain access to various engineering and scientific publications and commenced to put my time -- some of them would be of a popular nature, something like Popular Mechanics of the day. You know way back in these days one of the Gernsback publicati began its existence. And then at this time my father had in hand two little booklets on radio telegraphy, although-- radio telephony and radio telegraphy, and these were written in England and I studied these booklets.

Q Do you recall the authors of either?

A I do not. No.

Q Do you recall the physical description?

A The physical description of the books I recall perfectly. They were slightly greenish in tinge. They were bound with flexible covers, quarter of an inch thick and had pounds and shillings, shillings and pence on the outside.

Q What else were you reading at that time or what other activities of a scientific character were you engaged in at that time?

A Well, my father had an elementary book on physics which he had, I believe studied at Petty School for Boys previously.

Q At what?

A Petty School for Boys. And I was reading this, and this physics book was a book about three-quarters of an inch thick with a brown back. The author I cannot recall.

Q You had earlier mentioned doing arithmetic by the use of one or another of these slide rules?

A Right. Yes.

Q How early did you have an interest in aritheme tic?

A Well, I was -- during these years, of course, you know it was rather informal up to this time. I had been in the third grade and in the fourth grade and it was

rather informal at that time, but starting in the fourth grade and fifth grade I commenced to get a pretty intense interest in arithmetic.

I might add by way of information that the slide rule then pressured me deeply. This is perhaps -- well, I hesitate to recall this incident but I am going to do it anyway. How in the world a slide rule worked so that when you manipulated the slide it would give you the product instead of the sum of the two numbers which seemed obvious was a problem at my hand in those days, and I commenced experimenting with it and there was a small explanation of this in the book on the slide rule, and it gave very clearly logarithms to the base two in thatbook, and I could see how you could get the logarithm of eight pretty quick and the logarithm of four. I couldn't see how you get the logarithm of five, and this problem commenced to worry me for many months, many months. In between baseball games it worried me.

Q Now, during that period of time were you taking arithmetic as a subject in school?

A I was. Yes.

Q Had your mother been a professional person?

A My other -- my mother got through high school and took normal training and was a teacher in the public schools of New York State. That was her history, that is her

history. She still survives.

Q She is still alive?

A Yes.

Q At what age?

A 87.

Q In those early years, and by the time you were ten, how far advanced had you become in arithmetic or things, mathematics?

A Just about the normal advancement course work in school.

Q Were you reading any matters pertaining to arithmetic outside of school?

A Not much. I can't -- I don't quickly think of anything that I should tell you, Henry.

Q Then proceeding on from there, from that point forward, while you were in grade school, what else did you do that illustrates an interest in things scientific, and when I say things scientific, I am talking about the sort of thing that has been illustrated already?

A Well, up to what age, Henry?

Q While still in grade school?

A Oh, while in grade school. Well, about in the fifth grade the teachers where I was going to school commenced to see I could do pretty well in arithmetic, and grade school is an informal organization where there is no difficulty in

a person proceeding as fast as they want to. We had a new teacher who was a very aggressive lady from Mississippi by the name of Gertrude McArthur. And she proceeded to shove me and shove me and shove me so that by the time I reached the seventh grade I had finished elementary and advanced algebra.

Q And by the seventh grade you were going to school where?

A Still at Brewster.

Q Had you by the time you reached seventh grade read anything on the subject of computing machines?

A Well, I had read what was contained in the so-called International Encyclopedia.

Q Where did you find that?

A That was in the school library.

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Q And do you have any identification beyond the name of that encyclopedia?

A Well, my memory isn't perfect. It's vivid on some occasions. I should say that this occasion it's a bit vivid because I remember that on the first page of that article there is some crude computing device called, I believe, Chinese bones. This memory occurs to me. I don't know whether it's -- whether you could find out any time anywheres what that is. I shan't attempt to do so.

Q Do you have any further identification of this International Encyclopedia by way of the publisher, the date of publication, the place of publication?

A No.

Q The edition?

A No. I remember the character of the volumes pretty clearly because I realize since I have started this investigation that my memory is largely visual, and I can see the wreath on the back of the volumes --

Q You can see what?

A The wreath on the back of the volumes with a number, I kind of think the numbers are inside the wreath or just below it as I look back over these years and attempt to get the vision.

Q Have you in preparation for your testimony reread that encyclopédia or any part of it?

5-2-24

A No. I have not.

Q What else --

A I don't know why I didn't. I should have, of course.

Q What else do you recall reading in that encyclopedia on the subject of computing machines?

A Well --

Q If anything?

A I don't know. No, I don't know much, Henry. I think that I could pull something out of my head but I don't think I should if you don't mind.

? ?

Q Following that, then, what did you continue to study while you were in elementary school, if you went to elementary school?

A Well, I went to elementary school in the seventh grade and finished the elementary and advanced algebra in a single year or less, probably, I don't know. But then I moved to -- my family moved to Chicora, a town four or five miles away and I went to Chicora Elementary School and no provision was made for any advanced work in mathematics so I just didn't study mathematics at all and that was when I was in the eighth grade. I studied history and other things, also I learned to crochet in that year. I wasn't exactly occupied, illustrative of the fact I wasn't exactly occupied; and I studied astronomy by myself during these years.

Q From what source?

6-3-25

A From Young's Astronomy which belonged to my father.

Q And in connection with your studies of astronomy did you do any arithmetic, mathematics or calculation?

A Yes.

Q What did you do?

A I haven't any trouble recalling, I'm trying to think how I can phrase this so it doesn't look too preposterous, that's my only problem, to be frank about it.

Q We want you to be frank.

A Well, by this time I got sort of an idea of planetary motion, and I was spending all my spare time in those years attempting to perfect myself in computing planetary orbits according to Kepler's Principles.

Q Have you become familiar with Kepler's Principles by that time?

A I read Young's Astronomy from cover to cover.

Q And your answer to my question is?

A Pardon me? Yes. I am not responsive. I am sorry. Let's see. Yes. The answer is yes.

Q You say that by then you had finished elementary and advanced algebra?

A Yes.

E-7

Q Can you describe for the Court what you mean by advanced algebra as you had gotten to it by that time?

A Well, I believe that this -- I believe that this division has persisted to this very day as far as I can tell, and in high schools today students study elementary and advanced algebra and cover not exactly but substantially the same material and advanced algebra, elementary algebra includes all kinds of manipulations such as surds and roots and powers.

Q You had better describe or spell some of these words as you go along.

A Surd, S-u-r-d, roots, powers, laws of multiplication in quantities of this type, linear equasions in one or two unknowns.

Q Linear did you say?

A Linear equasions in one or two unknowns, advanced algebra, and I don't know exactly where the line is any more, such things as quadratic equasions. Perhaps that gives a fair-- sometimes simultaneous quadratic equasions too.

Q This you think you had attained by the time you were how old?

A Let's see? I am having a little trouble with age at this time. Oh, by the time I was 13, 13 -- possibly 13.

Q What is your earliest memory, Dr. Atanasoff, of having seen any kind of a computing device or calculator other

than a slide rule?

A Well, I know where I saw it and I hesitate to give the year but it was before, it must have been in the year I was 12 or so, and it was in the office of Amalgamated Phosphate Company, what was them Amalgamated Phosphate Company at Brewster, Florida, and they were using bookkeeping machines, a Burroughs, I believe. I believe a key operated machine like this (indicating), some kind of a key operated adder, and I am not quite sure. My memory is uncertain beyond this point.

Q Did -- excuse me. Did you on that occasion or following that occasion have any occasion to use one or another of such machines that you saw in that company office?

A I used them on every occasion I could get my hands on them.

Q Does your memory now tell you how many different kinds there were?

A I think there were three. I have quoted two of them and the other one is on the edge of my memory. I am not sure.

Q You mean by description or by name?

A Oh, I know what it was, if it was there, and I am inclined to say there was a Monroe Calculator there, but my memory is just a little hazy about the Monroe and I don't wish -- I'd rather the record show I did not mention that.

Q Now, you mentioned --

A I am sure this is getting that result the way I am

handling it.

Q You mentioned earlier some kind of keyboard machine that was manipulated, as you did it, you used both hands?

A Yes. Feldt & Torrant were manufacturers of that and it was called a comptometer, I think. I think that is the name of that machine.

Q Were you actually exposed to such a machine?

A Yes.

Q At this point?

A Yes. I had played with it, sure.

Q You played with it?

A Sure.

Q Was it play?

A Sure. I guess so. What's the difference?

Q What were you doing with it?

A Oh, I was adding up things that I could, testing my operation of the device with numbers whose sum I knew mentally so I could see if I was doing it right.

Q Was this adding?

A Adding and subtracting, but subtracting was complements, I remember.

Q Were you able to do complements at that time?

A Well, I was learning.

Q Did you do anything other than addition or subtraction?

A No. Maybe simple multiplication because there was an instruction book standing by.

Q Did you read through the instruction book?

A I looked at it.

Q Where did you go to high school?

A Well, you see, after this eighth grade at Chicora I went back to Brewster and the same teacher was still there, and I did a year more of school there which was really high school, I guess it was, let's call it the ninth grade, I don't know. In those days we called ninth through twelfth high school. And I was in the ninth grade there, but I got enough subject matter covered to include in my mathematics, I reviewed -- the teacher thought maybe I needed refurbishing so she had me review the advanced course in algebra which I did in about three weeks and then I did the subject of Trigonometry -- no, I am sorry -- geometry, the subject of geometry on that occasion and then I went two more years to high school in Mulberry and graduated in 1920.

Q Now, while you were in high school, what kind of subjects did you study?

A Well, they had something to say about that, and I studied the standard subjects including Latin, two years of Latin which I recount because it bothered me some, and English and biology and mathematics. I didn't study any math, let's see. I studied -- I guess I studied one course

in mathematics and took an examination on it, yes, trigonometry I studied while I was in high school and took an examination on it so I would have enough credits to graduate. They didn't give a course in trigonometry but I needed it particularly, I was short of trigonometry because I wanted to go off and do scientific work later, and I knew this already, and I was short of mathematics and they weren't accustomed to give too much mathematics in those days, but the teacher arranged so that I could and I had to study by myself and went up and took her examination and got credit for trigonometry in that way.

Q Dr. Atanasoff, are you able to say by what age it was that you had a definite fix on what you wanted to be for the future?

A Yes. I know what I wanted to do by the time I was in high school.

Q What was that that you wanted to do?

A Mathematical physics. I don't think I used the word theoretical. I used the word mathematical because I knew there was a juncture between mathematics and physics. I know that's what I wanted to do.

Q You were graduated from Mulberry High School then when?

A In June, I believe, of 1920.

Q While you were in high school, did you engage in

outside activities?

A No. Not much. I did not play baseball or any athletics. I didn't engage -- well, there weren't many other outside activities in high school in those days and I was also encumbered by the necessity to travel 14 miles to high school. We are still living in Chicora and I was traveling 14 miles to Mulberry and this occupied a part of the day and so I --

Q We don't quite see going back 28 miles a day, counting both ways, by the kind of conveyance we would employ today. How did you get back and forth?

A There were three methods. Sometimes there would be somebody going that way and I could ride with them in a car. Sometimes I rode a bicycle to Brewster and took the bus into Mulberry and sometimes I rode on a motorcycle.

Q A motorcycle in 1916 or '17?

A Well, let's say '18 and '19. There certainly were plenty of them in that day.

Q All right.

A And this was a belt-driven motorcycle, but Florida, you know, didn't have any bad -- much bad weather; wet weather, but not much other bad weather, and I could go back and forth.

Q While you were in high school, did you have any exposure to computing machinery other than or different than

you have heretofore described?

A I do not remember any.

Q Did you have exposure to the same kinds, did you have any exposure in using with them or didn't you?

A There were none around.

Q Did you have any at home?

A I did not except the slide rules.

Q Do you recall what kind of a record you had in high school academically speaking?

A Oh, generally poor record. I made perfect grades in physics and near perfect grades in physics, I should say, and mathematics, what I took I guess I made 95. I only took one course and that was by examination and I guess I made a good grade in that, probably 95. And I nearly flunked Latin, and I did so poorly in English that when the teacher found out I had made approximately 90 at the University of Florida, later she said she was sure it was because the English Department at the University of Florida was no good.

Q What about your other subjects?

A Indifferent.

Q After you were graduated from high school, you have said earlier you worked for a period of time. Was the work that you did manual or intellectual in character?

A I would say substantially manual in character.

Q Consisted of what in general?

A Well, during the rest of the summer I worked at the phosphate mine which is between what is now Mulberry and Lakeland near a town which is called Madilla during the summer, following my graduation from high school, and then I was taken ill and I went home and left my job and went home which was still, well, let's see, 18 miles south of there, and recovered and at that time I started prospecting for phosphate. I became associated with a group who were prospecting for phosphate and I worked with them, I believe, in one capacity or another until I went off to college.

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-8-1-26

Q During the time you were engaged in prospecting, did you participate in any studying or reading in a scientific area?

A Well, you see, my mathematics was still short of what was needed for engineering and I had contemplated taking a course in engineering to begin with, and I was short of solid geometry and so I studied solid geometry by campfire while I was prospecting. We camped out in the woods somewheres perhaps ten or twelve miles to the nearest town and maybe a couple miles to the nearest inhabitants, and we didn't have any other method of lighting in the evening except a campfire so I studied, I managed to study pretty well solid geometry by campfire.

Q Now, what --

A I can remember the flickering pages and every time I remember the flickering light, every time I look at a solid geometrical figure, you know.

Q Do you recall the text or texts you studied during that time?

A The what?

Q The text or texts?

A Well, I think it was Wentworth or Wentworth's Math or some such thing. Of course you can't -- I am not quite sure.

Q Then when were you admitted to the University as a student?

8-2-27

A I was admitted, I was admitted the summer after I graduated from high school but I didn't go and I went -- but that admission was suffice for the next year or so I went.

Q Was it necessary for you to take something like a college entrance examination at that time?

A No. The graduation from high school and transmission of credits sufficed for that entrance.

Q Then you entered the University of --

A Florida.

Q Florida?

A At Gainesville.

Q And continued your studies there for what period of time?

A For four years.

Q What was the course of studies that you pursued there?

A I was taking electrical engineering.

Q Can you describe the subjects that you studied in that course?

A Probably.

Q Do so.

A Well, the freshman year I took physics, mathematics which consisted of Schlichter's Analysis.

Q Spell it?

8-3-28

A S-c-h-l-i-c-h-t-e-r, I guess, Schlichter, something like that. He was, I know where he was, Schlichter's Analysis, the professor had come from the University of Wisconsin and Schlichter was a professor and later dean at the University of Wisconsin; and I studied shop, woodworking shop.

Q In college?

A A In college, yes. In those days they did it that way. This was a freshman year woodworking, English of course, mechanical drawing during my freshman year with emphasis on inking. That's a little in contrast with modern courses where much less emphasis is put on inking. Oh, and descriptive geometry.

Q In your freshman year?

A Yes.

Q Any other courses in the freshman year?

A I don't know. Probably so. But, possibly so, but it looks as if that's enough.

Q Then did you continue on in summer school or did you work or do something else?

A No, I went to work after that year at the University of Florida, I went back to a place called Pierce, Florida.

Q The name again?

A Pierce, spelled P-i-e-r-c-e, Florida which wasn't far from my home and took a job in a storeroom where there was stock to be kept for which I received the emolument of $65 a

8-4-29

month.

Q Doing what, stock keeping?

A Helping keep store, yes. You know, moving stock and inventorying it, and they pretty quick found out I could do it so they had me do mostly inventory.

Q During that period of time, your first year in the university of Florida, or that first summer, did you have anything to do with the operation or manipulation of calculating machinery of any kind?

A I do not remember.

Q Then your sophomore year at Florida, what was the character or what were the courses of your studies that second year?

A Well, I took calculus and I took chemistry. This is the reverse of what is customary in college nowadays, chemistry and physics are usually interchanged. And I took forge and foundry, and I took some elements of machine design, a little bit more advanced form of drafting. I took, I believe, mechanisms in my sophomore year.

Q Mechanisms?

A And the subject and text I can recall it was Schaub, Merrill and James. I can't -- S-c-h-a-u-b and Merrill, M-e-r-r-i-l-l, and James, J-a-m-e-s, I believe. I think I am all right on that.

Q What other course work did you do your sophomore

8-5-30

year?

A Well, you see, I could give the subjects that I took but separating them into years is giving me a little trouble. I am commencing to -- I think I probably had -- now, of course, somewheres in there I have to get in mechanics, strength in materials and hydraulics and I suspect some of them were also in my sophomore year, probably strength in materials, I don't know. I am not quite sure.

Q During your freshman or your sophomore year, were you employed outside of school?

A Well, during my freshman year I had saved up by these high wages of the day, I had saved up $500 so that I was able to go to college all right, and then by my sophomore year I was waiting on tables in the college mess hall to eat and I had a little money left.

Q During your freshman and sophomore years at Florida, were you doing any reading other than as required by the curriculum?

A Well, probably so, but the curricula in those days, as it is today in college, is enough to occupy a person particularly if he is working any at all, so I was pretty well driven by the necessity to study the courses which I, they were pretty easy for me. I'm not being entirely responsive I realize.

Q During your summer in between sophomore and junior

8-6-31

years, were you employed?

A Yes. Can you give me a start -- I know what I did -- my memory has failed me.

Q All right.

A I am not quite sure whether I worked in the stock room between my freshman and junior year, I mean my freshman and sophomore or between my sophomore and junior year. One summer I worked in the stock room. The last summer of all I worked for Jacksonville Traction Company, Jacksonville, Florida and my buddy and I surveyed all the streetcar lines then in Jacksonville and there are none now, I might add, and have not been any for many years. And there was a year lost and I presume I will pick it up so I am a little uncertain about exactly what happened there.

Q During your junior year then at Florida what sort of course work did you engage in?

A I was majoring in electrical engineering. During my sophomore year, I can add, I had my first course in electrical engineering. So then I passed into more advanced work in electrical engineering and between the junior year and senior year I took all the subjects then offered in electrical engineering, and I know I had direct current machinery during my junior year. And let's see, I ought to be able to quote the author of the text used in that. I know it. It's somewheres close to the surface in my memory

8-7-32
(9)

but it isn't here with us at the moment.

Q All right. Then continuing, what other course work did you have in your junior year?

A Well, I had, let's see. Now, I had during my sophomore year I finished chemistry and I elected to take two more courses in chemistry and one of them was qualitative analysis and another was organic chemistry, and I think organic chemistry was taken in my junior year or at least partially taken in my junior year, and I believe in my sophomore year I finished up a course in qualitative analysis, and I remember also that I elected to take a course in psychology and I think that was taken in my junior year. There were several courses in electrical engineering, but I am having a little trouble remembering how they were inter-related.

Q Moving on then to your junior year, what course work did you pursue then?

A Now, of course, there was a thing called telephone engineering in those days, and this is where it's a far cry from the present era, and I took, I think I took the telephone engineering in the junior year and in this senior year we were going into alternating current theory, alternating current machinery, transmission lines, and we had somewheres along the line, I had my first course in -- I had a course in contracts, either my junior year or my senior year, I expect

9-1-33

my senior year. I believe there is another course in English during the senior year, a course in economics during the junior or senior year and I don't remember which.

Q During your course of studies at the University of Florida at Gainesville, did you achieve any honors while you were there in school?

A Well, I was elected a member -- well, I was elected a member --

Q You should speak up, Dr. Atanasoff.

A I was elected a member of Phi Kappa Phi during this period, I remember that. I was elected president of Benton Engineering Society which was another kind of thing. I was a member of the debating council at the University of Florida.

Q Did you become a member of any other societies while you were still enrolled at the University of Florida?

A I believe not. I am not sure.

Q Prior to the time of your graduation from the University of Florida, had you ever been employed or acted as a teacher?

A Well, I was -- I started waiting on tables --

Q I suggest that's not responsive.

A Well, it is, it was just about to become responsive. I believe you will find I will connect it anyway. I started teaching -- I commenced waiting on tables in about mid year, when I got a sudden call from the -- from the superintendent of

9-2-34

the local high school and he wanted somebody to teach science and how he got my name I am at a loss to determine because we had a teacher's college there and he normally should have drawn teachers -- now, I see I am wandering astray. I am not being responsive, Henry. I will quit right here.

Q Then did you engage in teaching?

A I did so at his instance. He says --

Q Now, that gets us into hearsay, you see. Where did you engage in teaching and what did you teach?

A I engaged in teaching at the University -- at the high school in Gainesville, Florida and I taught science.

Q What kind of science?

A I taught physics and general science and chemistry.

Q In order to do that, did you take any kind of an examination?

A I did.

Q What kind of an examination?

A Well, it happened that you should have a degree if you taught in high school, but they would accept you if you passed a qualifying examination and the principal suggested to me that I take a qualifying examination, and I said I can't possibly pass it, but I took it and I did.

Q Did that require you to do any special studying?

A Yes. I studied -- I had to pass an examination in biology and I studied biology for two days.

9-3-35

Q Did you study anything else in preparation for that?

A I didn't study anything else.

Q And that occurred about when?

A In the middle of my junior year at the University of Florida, somewheres near the middle, it might have been a little sooner or a little later. There was an occasion for this.

Q Were you finally graduated from the University of Florida?

A I did. Yes.

Q When?

A In June of 1925.

Q Do you recall the date?

A I do not recall the date.

Q Did you receive a degree?

A I did.

Q What was the degree?

A It was Bachelor of Science in electrical engineering.

Q Were you awarded a diploma?

A I was.

Q Do you recall what kind of a record you had at the University of Florida?

A I had a middle to good record.

Q State what you mean by that?

A Well, I had an average -- I had an average grade, I

9-4-36

believe now of ninety-four and seven-tenths in subjects -- in subjects pursued in course, that means those subjects which pertained to the degree in electrical engineering; that did not include the English and the extra chemistry and psychology.

Q Do you remember the time that you were at the University of Florida and before --

A It included first, the course in English -- no, it included all English, I am sorry. I must have a correction. It included all the English but it did not include the psychology and extra courses in chemistry. That's right.

Q During the time you were at the University of Florida, did you have any experience with any kind of calculating or computing machines?

A Yes.

Q State what that was, please?

A I had a moderate amount of experience around the offices there with Monroes in these days, Monroe Calculators, and while they weren't generally available for general use, occasionally I would do a problem on a Monroe.

Q Can you recall the character of the problem you would do on a Monroe at that time?

A Just an ordinary problem in multiplication and division, nothing esoteric or abnormal about it.

Q During your time in college, were you doing any

)-5-37

extracurricular reading?

A Yes. Yes.

Q What was the character of it?

A Well, of course, everybody in that day was interested in radio so I was trying to keep up a general relationship with the subject of radio.

Q Did you have a radio?

A No. I had none.

Q None of any kind?

A No. There was none.

Q Did you have any experience in working with the radio?

A Yes. A little.

Q Describe that?

A Well, I in association with some of the other boys there helped build a regenerative receiver, a rather elementary one-tube regenerative receiver with a "B" battery and a storage "A" battery.

Q When was this?

A 1923, '22. And we heard KDKA.

Q Where was that?

A Pittsburgh.

Q Those were what that you just gave us?

A The letters, call letters for a station, KDKA are call letters for a station in Pittsburgh, Pennsylvania which

-6-38

existed in those early days.

Q Had you at that time had any formal training in vacuum tube circuits?

A No.

Q Why not?

A No formal training. The universities hadn't advanced that far. They weren't even sure it was going to work.

Q And at that time when you participated in building this radio that you have described by what method did you go about it?

A Well, you know we had circuits and it wasn't -- they didn't have but about five wires in it, Henry, so you could almost proceed by chance and get it to work more or less, and it belonged to a boy by the name of Fuller, I remember that.

Q What?

A Fuller, F-u-l-l-e-r was his last name. His first name escapes me because he had some brothers and I am afraid I will confuse his brothers' names.

Q Was that the only exposure you had to radio or radio circuits during your college engineering days?

A Well, I read about them.

Q I beg your pardon?

A I read about them.

Q We will get to that in a minute. I am talking about

working with devices?

A Yes. The only one.

Q That's the only one?

A Yes.

Q Was your exposure to calculating or computing machinery during your college years limited to the Monroe?

A Maybe a key-driven Feldt and Torrant comptometer. I believe there were some of those around, and I probably had my hands on them.

Q Do you have any recollection during your years at the University of Florida of ever having taken apart any kind of a computing or calculating machine?

A No.

Q Or put one together?

A No.

Q During your college days at Florida, you have spoken of reading about radio. In what sources did you conduct such reading?

A I remember in some of the periodicals of the day and I expect they were Gernsback, I can't remember for certain, but I believe they were Gernsback publications and then --

Q Were those periodicals?

A Yes. Gernsback Publications were periodicals, he put out -- they are -- Gernsback, his company is still putting out radio publications and they have been doing it all these

)-8-40

many years.

Q I had the impression they are science fiction type things?

A Well, you know he also ran a series of scientific publications but this is quite aside from that, and this is periodical literature on radio.

And then I had a book, and I am sorry I cannot give you it, it was more or less the book -- a book on the current state of the art of radio, and I can tell you a little bit about the inside of it.

Q You mean by description?

A By description.

Q Do so, please.

A Well, this book was a wonderful book. It had vacuum tubes in it in a very limited portion, but it had such things as Alexander's alternators and Gouge-Smith alternators, and also, of course, Spark Gap, lots of Spark Gap transmitters, crystal detectors -- that's a story, I can't tell stories here.

Q No. What else about the contents of this publication can you recall?

A Well, I don't know. My mind is limited here a little. I don't remember.

Q All right.

MR. HALLADAY: It's 3:22, would this be a convenient time to break?

(Recess taken)

E-10

(Atanasoff Deposition Exhibit K marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, I have had marked as Atanasoff Deposition Exhibit K, a certified copyof a transcript of your record at the University of Florida. Can you identify that as being a true transcript of your record while at the University of Florida?

A I cannot identify every entry, but it looks as it it is a purported transcript, and as far as I can find any fault with it, it is a true transcript.

Q I notice a reference on it to something about correspondence credit. Do you have a recollection of engaging in any studies through correspondence in connection with the University of Florida?

A I do.

Q What is that?

A Well, let me find it here and verify my experience.

Q At the foot of the righthand column.

A Yes, Math IV correspondence credit.

Q Math IV?

A IV, yes.

Q What was that subject?

A That was the third semester of calculus which I took while working at the City of Jacksonville by

correspondence.

Q Does that transcript, Atanasoff Exhibit K, reflect the specific courses that you studied in the specific years while you were at the University of Florida?

A May I see it again when Mr. Dodds is through?

MR. DODDS: May we have a copy?

MR. HALLADAY: A copy will be given you.

THE WITNESS: The freshman year looks exactly right. I forgot surveying in the sophomore year, and I took the course in psychology in the sophomore year, applied mechanics, metallurgy in the junior year, which is close to what I said, and I think it generally confirms what I said. I see no particular difference.

BY MR. HALLADAY:

Q Do you find that Atanasoff Deposition Exhibit K reflects any courses which you did not take?

A Well, gentlemen, I point out a grade 25 in French with embarrassment.

Q Was that a course you did not take?

A I believe that is. I believe that, I believe it is. I believe thatwhat happened was I knew I was going into graduate work and I knew I needed knowledge of French and German and I arranged to visit courses in French and

German during the summer, and my German does not appear on this record as it appropriately should not, but my French by some means does appear here with a grade which I have no fault to find with it.

Q While you were at the University of Florida, did you study German?

A Only this summer.

Q Which summer?

A The summer of 1925.

Q And while you were there, did you study French?

A Yes, during the same summer, and both on a reading, on a visiting basis; just an error in the records there, so they got out a grade for French and they didn't for German, but I feel really pretty, well, I am not too unhappy about this grade in French, because subsequently I found myself -- this isn't responsive.

Q No, it's not responsive.

A Interrupt.

Q Did you take either German or French at the University of Florida for credit?

A I believe I did not. Now it appears that I did, so you can have your choice.

Q All right, sir. After you were graduated from the University of Florida, did you continue with further schooling?

A With what?

Q Further schooling?

A Yes.

Q Where did you next go to school?

A I went to Iowa State College.

Q When?

A In the fall of 1925.

Q Now, earlier in your testimony you had spoken of Iowa State University; you now say Iowa State College. Are they one and they same or is there some difference?

A They are one and the same, the name having been changed in the interim.

Q When you went there then for the first time in September of 1925, was it September 25th?

A It was, it was -- let's see, I believe it was September 21, 1925.

Q You entered then in what status?

A As a graduate student, and also had employment as a graduate assistant, I believe they called it, or teaching fellowship or something like that, but I think graduate assistanceship is the correct term.

Q In that capacity, was that work for pay?

A That was work for pay.

Q Do you remember how much the pay was?

A My pay was $800 a year.

Q Then was that a course intended to lead to something in particular or was it simply general studies?

A Well, it was -- I was taking -- I was teaching mathematics approximately half time, and that's responsive, because the other half time was used in studying mathematics with a minor in physics.

Q As a graduate student, then, as of 1925, what was your objective or target?

A I planned to become a mathematical physicist.

Q Were you looking to some degree?

A Yes. I expected to get first a master's degree and then the Ph.D. later.

Q While at Iowa State, did you ultimately receive a degree?

A I received from Iowa State in the -- see, this is-- in the summer of 1962, I received a Master's degree in mathematics.

Q Did you have occasion to write a thesis for that degree?

A I did.

Q What was the subject of the thesis?

A The thesis was about -- the thesis was about the application of the principle of the viriala claussius to a spherical symmetric molecule.

Q Can you explain for lay understanding what the thesis was about?

A Well, it depends a little bit on my remembering, to begin with. Well, you know, in these years they had, the theory of a gas was becoming rather clear and there were various methods of calculating from the structure of the molecule what its equasion of state would be, that which roughly means the pressure temperature volume relationships on an engineering basis. This is what equasion of state is about, and one of these methods which had been used very little at that time, I don't think very highly of my thesis, but I am rather proud of one thing that I chose a method of approaching this subject which had been used very little at that time, but has since been used over and over and over again as a method of computing the equasion of state from the structure, and this was a method, the method of the viriala, so-called method of viriala.

Q During the time that you were at Iowa State did you become exposed to or have occasion to use any form of calculating or computing machinery?

A Yes.

KL=41
11/11/68
EA#11-1

Q That's this occasion now when you were studying towards your Master's Degree?

A Oh, cutting off in the Master's Degree?

Q Yes.

A In that interval I worked with, I worked with the Monroe calculators during this interval I was -- I knew generally how a Monroe worked but not very exactly so I proceeded to take one apart and investigate its innards to some degree and this is the University's machine and that was all right.

Q Can you tell us when you did that approximately?

A I believe in the period, during the year of '25 or '26, I don't know exactly. I remember that in those early years I also was exposed again to a Feldt and Torrant key-driver machines, so-called comptometer. I remember they were around. And then even during this year I commenced to have some contact with IBM computing equipment.

Q What was the character of that equipment?

A Well, this was an IBM machine which was designed to repunch cards and sum the total with some degree of control, and this is the so-called IBM tabulator. And they used to be called Hollerith tabulators too in those days because IBM had just acquired this type of equipment, had just started to take over from Hollerith.

Q Hollerith?

11/2/42

A H-o-l-l-e-r-i-t-h, I don't know, something like that, Hollerith.

Q And during the period of time when you were at Iowa state studying for your Master's Degree, did you have any exposure to electricity, electrical circuits or circuits involving vacuum tubes in any way?

A Almost none. I took courses in physics but not in that subject matter.

Q When did you receive your Master's Degree?

A Well, it was during the summer of 1926. The date escapes me. It could have been at the end of the first summer term or second summer term and I can't tell which.

(Atanasoff Deposition Exhibit L marked for identification.)

MR. HALLADAY: Mr. Anderson, would you read the last answer, please?

(The answer was read.)

BY MR. HALLADAY:

Q I have had marked as Atanasoff Deposition Exhibit L a certified copy of the transcript of Atanasoff, John Vincent, from the Iowa State University of Science and Technology, formerly known as Iowa State College, would you look at that, please?

A Yes, sir.

Q Does that represent an accurate transcript of your

11/3/43

record while at Iowa State College during the course that you pursued leading to your Master's Degree there in 1925 and the following years?

A It seems to be, yes. I don't know whether this is sufficient for your purpose. I have no way of, immediate way of verifying it but it seems to be right.

Q And then with respect to your thesis, Dr. Atanasoff, do you now know or does your memory tell you whether or not in the documents that you have brought here there is a copy of your thesis?

A Not in the documents I brought here.

Q I didn't hear that?

A No, sir. Not in the documents I have brought.

Q Was your Master's thesis published?

A It was not published. It was just published by recording in, I don't know, the records at Iowa State College.

Q But given no outside publication?

A That's true.

Q As far as you know?

A I am sure it wasn't.

MR. HALLADAY: Here is the original of Atanasoff Deposition Exhibit L, Mr. Dodds, and once again we will furnish you with copies.

BY MR. HALLADAY:

Q Now, I observe on Atanasoff Deposition Exhibit L an

1/4/44

entry under the heading of Winter 1927, and the title "Adv. Phys Chem," plus the heading, "Chem 620b;" under the column entitled, "Quarter Credit," the number "2"; under the column headed, "Mark," the capital letter "D"; and then after that inserted the figures, "2/10/27". Can you explain by your memory how you happened to get a D in what appears to be advanced physical chemistry?

A I did not -- now, is this the original?

Q Yes.

A I wonder. Well, I know what it is and it's not a D, it's a drop. The date is by the side, 2/10/27. What had happened is I wanted to -- I had been taking courses in mathematics and physics and I wanted to get into some more chemistry and I took physical chemistry, and I started taking a course in physical chemistry and the instructor says, "Look, why foot around with this, why don't you --"

Q Wait a minute. You are getting into hearsay.

A Okay. It became apparent to me that the course was easy and with the consent of the instructor -- hearsay -- I guess not. With the consent of the instructor, I dropped, and the advice of the instructor I dropped that course and you will find below it Applied Physical Chemistry 621c two credits, Passed, that was the most advanced course in physical chemistry at Iowa State University so I went from a relatively easy course to a much harder course and passed it all right. And I only had, let's see now, this was in the second quarter and

the date here is February 10, and the quarter began at the beginning of the year so I had had a month in the elementary course and perhaps a month and a half in the advanced course but I passed it all right. It's a matter of record there.

Q Did you take advanced physical chemistry 620 and 621 in the same quarter, winter 1927?

A They are both indicated there, but I didn't take the advanced until after I dropped the elementary course. I just went right into the advanced and took the remaining term and passed it, both recorded in the same quarter there.

MR. DODDS: Excuse me. Could I see that?

THE WITNESS: Please.

BY MR. HALLADAY:

Q After completing the work at Iowa State, did you receive a Master's Degree?

A I did.

Q And some kind of a diploma or document to indicate that?

A I did. Yes.

Q Following that, what did you engage in doing?

A Well, the following year I was made an instructor in mathematics and with an advance in salary I continued to take course work, advanced course work in mathematics and physics.

Q How long did you continue that?

11/6/46

A Well, let's see, I can figure it out in a moment. Until February of 1929.

Q During the period --

A Perhaps March. I can't quite be sure, February or March of 1929.

Q During the period for which you were both studying and teaching, were you engaged in any use of any kind of calculating or computing devices?

A Well, no extensive use. I was spending the summertime hanging around the statistical laboratory looking at IBM equipment but I had no direct connection with this.

Q And during that time were you involved in any way in dealing with circuits that employed vacuum tubes in any way?

A No, sir.

Q Had you by that time become exposed to any type of tubes that involved gas rather than vacuum?

A I probably had heard of them but no further exposure.

Q And by that time had you taken any course work in such matters?

A I had not.

Q Were you doing any extracurricular reading during the time that you were an instructor at Iowa State during the years that you have mentioned?

A Yes. I was attempting to read mathematical periodicals during this period and the Physical Review, which

11/7/47

my memory tells me was considerably simpler than it is today.

Q By that time, Dr. Atanasoff, other than the reading which you have told us about that you had done in the International Encyclopedia, what if any other reading had you done on the subject of computers, calculating machines or the history thereof if any?

A Well, it always remained a vague interest of mine during these years, and I am sure that in the intervening years I had read what other encyclopedias had said about it. I had looked for books on computing machines. I had found, I believe not a one at that stage, I am not sure, but I don't believe I found a book. I remember looking for books on computing machines.

Q Other than the International Encyclopedia, can you now call to mind any other publications that you read?

A Well, I read --

Q That you read on the subject of computing machines to use that as a general term?

A I read Encyclopedia Britannica on the subject which was rather more complete during these years.

Q Do you recall what edition of the Encyclopedia Britannica you read?

A Well, I know that current with, an important edition during those years, I cannot remember exactly what edition I read, but I know that current with our interest those years

was the 14th Edition and it may well have been the 14th, but if it was not the 14th it was an edition near the 14th.

Q Now, do you recall where that Encyclopedia Britannica or the set of the encyclopedia was situated?

A Well, it was situated in the reading room of Iowa State University, I remember that distinctly.

Q And was your reading of it limited to computing machines or did you read it on other subjects?

A Many other subjects, of course.

E-12

Q Did you read whatever the topic was that dealt with computing machines in the Encyclopedia Brittanica during those years before you went to the University of Wisconsin?

A I did. Yes.

Q Do you have a memory now of the general content of what you read in the Encyclopedia Brittanica on that subject?

A Not a very good one. I remember that -- I believe that in the International Encyclopedia the name Babbage had been mentioned, but there is a great deal more emphasis on the work of Babbage in this Encyclopedia.

Q Who is Babbage?

A Babbage was an Englishman who invented a computing machine and who was, conceptionally had a good grasp of computing machines, however to the base 10, and the mechanism above which they would progress.

Q Do you remember whether or not his name was given, his machine was given a name in the edition of the Encyclopedia Brittanica which you read.

A I have a vague recollection of it, it had a name and I forgot it.

Q Can you recall that name to mind now?

A I cannot, no.

Q Do you recall any other published works that you read during this period beforeyouwent to the University of

Wisconsin on the subject of computing machines?

A I do not.

Q Then when was it that you went to the University of Wisconsin?

A February or March, 1929.

Q And to what end did you go there?

A I went there to secure a Ph.D. degree.

Q How long did you continue at the University of Wisconsin?

A Well, I got there in the middle, spring semester. They were on a semester system. I got there in the spring of the semester system, and I terminated there, I don't know, at the end of the spring term or at the end of a summer session in '30.

Q When you went there in 1929, did you immediately enroll in course work?

A Yes. Courses were -- the courses -- the advanced courses were in the middle of the second semester, but I did so enroll in two.

Q What were they?

A Quantum mechanics and theory of elasticity taught from Love.

Q Quantum mechanics?

A Yes.

Q And thereafter what course of study did you pursue

at the University of Wisconsin?

A I was moving toward an advanced degree in theoretical physics.

Q What kind of courses did they involve?

A I took two courses, not too many more, I will have to -- for instance, I had another course in magnetic phenomenon, a lecture course by J. F. Van Vleck, and I did a thesis, I had transferred from Iowa State College quite a few credits and they were accepted by the University of Wisconsin and I also passed the reading knowledge of French at this time.

Q You did what?

A Passed the reading -- I passed -- I took an examination and secured credit for a reading knowledge of French.

Q In order to do that, did you engage in any special study?

A Yes, I did.

Q What was it?

A Well, all of us --

Q What was the course of study?

A All of a sudden I woke up to the fact that if I was going to get a degree when I had to, why I had two weeks to pass off the reading knowledge of French, and so I studied French two weeks and went up and took the

examination.

Q What other proctors, instructors or teachers did you have at the University of Wisconsin?

A I had J. H. Van Vleck and then I had a man by the name of Wenzel who succeeded Van Vleck. Van Vleck had went to work abroad and Van Vleck -- and Wenzel came from Zurich to replace him, and I had my good old friend whom I know and love so well who took such good care of me during those years, and who taught elasticity and whose name I will have to fill in after a moment's consideration.

(Atanasoff Deposition Exhibit M marked for identification.)

BY MR. HALLADAY:

Q I have marked as Atanasoff Deposition Exhibit M, for Mary, a transcript of your record at the University of Wisconsin. Do you recognize that as an accurate portrayal of the course work which you did there?

A I do.

Q By looking at that, does it give you any key to the name that escaped you?

A Yes. H. W. March.

Q While at the University of Wisconsin, were you exposed to a man named Weaver in any way?

A I had a course in electricity magnetism taught by Dr. Warren Weaver.

MR. HALLADAY: Again, Mr. Dodds, we will give you a copy of Atanasoff Exhibit M in, we hope in due time, which we trust will be very soon.

BY MR. HALLADAY:

Q Did you write a thesis at the University of Wisconsin?

A I did.

Q What was the title or subject of that?

A The Dielectric Constant of Helium, the Dielectric Constant of Helium.

Q Tell us, Dr. Atanasoff, if you can, in lay terms what that thesis was about?

A To lay a slight foundation, your remember in those years that the subject of quantum mechanics was coming into its own. Then it became possible to approach the structure of atoms in a pretty systematic and exact way. This was by the methods which have associated with them the names of P.A.N. Berac, W. Heisenberg and Schroedinger. These gentleman had penetrated the dynamics at atomic level and had furnished methods by which calculations could be made. During the, about that time, a year or two before that time, a German scientist by the name of Hylleraas, I'll see if I can spell it, H-y-l-l-e-r-a-a-s, Hylleraas, had made a computation in regard to helium which had extreme

mathematical difficulty, but he was able to depict the ground state of this atom with high accuracy. I used his functions to go a step further and calculate how that atom would behave when it was placed in an electric field.

Q Was that thesis published?

A Yes.

Q Do you recall where?

A It was published in the Physical Review, I believe. Physical Review or what was then the equivalent of it, it's changed its name.

Q Does the file which you have brought with you and which has heretofore been identified by the file folders include a reprint?

A It does.

Q Of that thesis?

A It does.

Q With a serial number to identify it, or is that one which has not yet been serially numbered?

A I don't think that one is serialized. I am not quite sure but I don't think so.

Q For the purposes of the record, I see you don't have your lavaliere on --

A It is in the folder I, all right. Let me find it. It is a colored -- there it is.

Q Do I observe, with your concurrence, that a green

folder containing a reprint of your thesis is in the folder we have heretofore marked as Atanasoff Deposition Exhibit I?

A It is.

Q Is it correct that the documents contained in Atanasoff Deposition Exhibit I have not yet been serially numbered?

A That is true.

Q And hence they do not show up on Atanasoff Deposition Exhibit J?

A Because this section has not been added to that record.

Q All right. While you were studying at the University of Wisconsin in the course which led to your thesis and your degree, were you also employed?

A May we have --

Q Were you also employed during the time you were working on your doctorate?

A Yes. You see, the first spring I was without employment, come fall I was given an instructorship in mathematics, and I held it during the academic year 1929-30 at the University of Wisconsin and also held it during the summer, during one summer, I think it was the last summer that I was there.

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-A 13/1

Q And when you were teaching mathematics to what classes of students were you doing that?

A I was teaching mathematics, since I had come from Iowa State College I had had lots of experience teaching engineers and I was therefore assigned to the course in engineering.

Q And what kind of mathematics were you teaching?

A Well, I was teaching Schlichter's Analysis again which I had studied in college, and I also had taught calculus and perhaps other subjects, I am not quite sure.

Q And then, excuse me --

A Pardon me.

Q Were you awarded your Doctorate as a result of or following the thesis you wrote?

A I was.

Q Approximately when was that?

A Well, it was during the summer of 1930, and I believe it was at the end of the summer of 1930 after a summer session.

Q While you were at the University of Wisconsin pursuing your work that led to the Doctorate, did you receive any awards or any honors?

A I was made a member of Signa Psi.

Q What's that?

A It is an honorary graduate fraternity. May I continue?

13/2/50

Q Were there any others or is there some further explanation?

A Further explanation. And I cannot prove this.

Q You mean you have no documents --

A Unless -- unless -- I have none, and the records of Sigma Psi do not show it. I will hasten to add in case anybody looks it up, maybe Van Vleck would remember it. I have never asked him. He was the man that recommended me for this, of course, because he was my major professor, and he did it in the spring before he left there to go to Germany, and I was left alone and did it in the spring, I suppose of, let's see, '29, and it has just evaporated, and I never bother to argue about it. Somebody looked into it, I never looked into it myself, somebody else did and they claim it's evaporated. I don't even know it's evaporated. I don't know where it is.

Q Did you receive any other honors during the time you were at the University of Wisconsin?

A I do not know. I don't think so. I don't think I got any other honor.

Q Following the receipt of your Doctorate, and by the way, did you get a certificate or diploma of that?

A Yes. I received a diploma.

Q Following that then what did you do?

A I returned in the fall to Iowa State College.

Q While you were at the University of Wisconsin and

13/3/51

working on this thesis, did you have any mathematics that you were required to do to come up with the thesis?

A Yes.

Q Can you describe the character of that mathematics?

A Yes.

Q In terms that a lay person can be expected to understand?

A Well, it turns out that making a calculation of this kind, you see, this is a problem in differential equations or rather perturbation theory in differential equations, no exact methods, only approximate methods can be used. And when you -- when you approach these approximate methods, following the Hiller House pattern, you then have an enormous amount of calculating efforts to do in order to get the result, and I remember that I was calculating for considerably more than a month continuously. Of course, probably the calculation took two months, but I worked much more than half time on them.

Q What do you mean that the calculations took a month, or whatever it was you said, what were you doing that would take that length of time?

A I was sitting still with a computing machine or an algebraic expression on a piece of paper in front of me making calculations, algebraic calculations because these things had to be worked out and then afterwards numerical calculations to evaluate the answer.

13/4/52

Q Were you doing this without assistance?

A Without assistance, without any assistance at all.

Q And you say you were using some kind of a computing machine?

A Yes. I had accessible then a Monroe which I was using for that purpose and which by that time I was very familiar and so my numerical part of the work could be done with a Monroe. The University of Wisconsin supplied this machine.

Q Well, when you speak of a Monroe, what do you mean by that?

A Well, a Monroe was a commercially successful calculating machine. It had a keyboard and you could put any number you wanted on the keyboard and everytime you turned a crank it would add this, one revolution it would add this number into a set of dials up at the top, a register of a kind. It has kind of a peculiar set of gears inside of it so when you pressed the five key there would be five teeth extended.

Q Five what?

A Teeth extended in the circumference of the register of one dialing the register. It would come out here a ways and to a certain column and if you pushed a five in that column then there would be five teeth extended. Now, the way those teeth are extended was that they had little gears that slipped past each other laterally so as to line it up so there would be.

13/5/53

five teeth there, and maybe two teeth would come in from the left and three from the right, but however it was, there were five teeth in that line so when you turned the crank once it would inch toward the dials above that point five jogs which meant adding five in that place, and that place, they were made various sizes, eight, twelve, sixteen in the keyboard and then the dials were carried by a carriage, an interrelationship between the carriage and the keyboard could be altered by a process which we called shifting. At your left hand was a little thing that, a little knob which came out and had a cross on it and you flipped it that way (indicating) and that would cause the carriage to shift one place compared with the keyboard and so you could easily do multiplications. If you want to multiply by 25 you turned it five times and then you flip and turn twice and your product would appear on the register above. There are other machines of this same kind but Monroe was the one I used.

Q During the time that you were working on this thesis on the dielectric constant of helium, did you use machines other than the Monroe or was your work limited to the Monroe?

A It was so limited.

Q Now, had you before that time ever taken one of those particular machines apart?

A What particular machines?

Q Monroe?

3/6/54

A Yes. I told you, I believe, if my memory is correct, during my stay at Iowa State University that I took such a machine apart.

Q Did you while working on or with that machine at the University of Wisconsin ever have occasion to take it apart?

A No. They were very rugged machines, gave little trouble.

Q Did that have any electrical power connected with it at all?

A The one I had, and I can't remember the state of the development of Monroe's at that time, whether any of them had electricity on them in 1930 I cannot tell you, but the one I had, was using, did not have electricity.

Q After completing your degree at the University of Wisconsin then, where did you go?

A I returned to Iowa State University.

Q In what capacity?

A As assistant professor of mathematics.

Q And as such a professor of mathematics, what classes of students were you teaching at first; what kinds of students did you get later on during the time that you were there?

A Well, when I returned, I was teaching freshmen and sophomores, principally, I imagine principally sophomores, and teaching calculus, differential equations, and the like. I was very anxious to pass into the teaching of graduate work

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and rather quickly the opportunity arose to teach a course in advanced dynamics, a mechanical course, and I taught this course and very soon, in a year or so, I was made professor, not merely assistant professor, you remember, made assistant professor of mathematics and physics instead of just being a professor of mathematics. Soon after this appointment was changed, I left the mathematics department and took an office in physics in '52 physics where I remained for quite a number of years.

Q And did that remain your situs of work until you left Iowa State?

A I was in that office until I left that -- left Iowa State University in September of 1942.

Q Was it the same room?

A The same room as office.

Q Was it the same building?

A Same building.

Q So that your work in terms of an office or building was at the same location from when to when?

A Well, I have to guess a little, but I imagine probably from, when I first returned, well, I imagine for something like from '33 to '42, nine years.

Q And during that period of time, were the classes conducted also in that same building?

A Well, if there were classes -- What happened at that

point was that my, I can't quite be sure, I know there were some courses in the other building where the mathematics department was, but within a very short space of time, I was allowed to teach all my courses in the physics building so they would be adjacent to my office.

Q During that period of time of approximately nine years, were your students always undergraduate, always graduate or always some combination, what would you tell us?

A During the first years there were some combination, but within -- by the year 1935 or '36, perhaps, why I was teaching entirely graduate students and this remained true until almost, without exception, at least almost without exception until I left Iowa State University in 1942.

Q In terms of teaching graduate students from the time you came to concentrate on such teaching, was that teaching classroom, lecture, didactic, experimental or a combination or describe it if you would, please?

A Well, I was a theoretical physicist, at least aspiring to be, and so I was teaching theoretical courses which meant I was teaching classroom courses. These classroom courses were taught on the basis of lecture method in the main. Namely, the professor gets up in the front and talks and writes on the board and some of the students write hurriedly to follow him and some students don't, and, however, there is supposed to be some transmittal of information from professor

13/9/57

to students.

Q As a physicist during that time, did you engage in any laboratory work or anything that could be called laboratory work?

A Yes. Well, the answer is yes.

Q Can you describe in a general way, at least the character of that laboratory work?

A Well, I previously testified that I hadn't studied any courses in electronics and, however, as soon as I returned to Iowa State University in the fall of 1930, I commenced investigating electronics, and I gave myself a diligent one-or two-year course in electronics and then I commenced to propose to direct graduate work in various subjects by electronic means.

Q Now, Dr. Atanasoff, you have used the term electronics. Can you state for the record what your use of that term means?

A Well, in those days, if you will permit, the term electronics referred to electrical circuits which had power-generating elements called vacuum tubes in them, and these tubes were used as amplifiers and oscillators and what-not, whatever, and the subject of electronics had not become very advanced, or I couldn't have perfected myself in it quite so hurriedly, but it was a very intense course that I gave myself, and I got fairly, currently conversant with the art in that.

Q To what sources did you go to become conversant, as you have said?

A I started by reading the Radio Amateur's Handbook, by building two receivers and then studying more advanced works like Vanderbijl and reading the periodical literature of the day including an English periodical on radio. Radio was a principle application of electronics still in those days but it was commencing to enter into and become a great physical aid and this was a thing that I knew that I should advance myself in this direction.

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Q You say you built two receivers. What did you mean by that?

A Well, these were, this was a construction project which I conducted on my own. I went out and bought vacuum tubes and put together one regenerative receiver which is a very simple one which took a very short period of time and a rather elaborate superheterodyne receiver with which in those days I could easily receive transmissions along the -- this was in '31, '32 -- and I could at least get, I remember one station I used to receive quite regularly on that receiver was Madrid, Spain. That was coming through with a good signal in those days, and I bought, but also manufactured with my own hands such things as I.F. transformers and the various radio frequency coils and the art was quite different in those days than it is today, and I remember at this time that the vacuum tubes which I bought for this set were named Arcturus, and they were blue in color.

Q Do you recall the manufacturer?

A Of those tubes?

Q Yes.

A Arcturus, A-r-c-t-u-r-u-s.

Q What were the articles or publications that you read in that process?

A Well, I remember Wireless World, I believe was the

name of the English publication. You know, strangely enough, I can't remember a similar name of an American publication. I remember that the electrical engineers had started to put out information along this line and the journal, and I don't know, I forget what the name was at that time. You know the name has changed two or three times since, and I think that the Institute of Electrical Engineers had -- and then -- had publications which occasionally had radio frequency and then increasingly frequently had radio or electronic articles.

Q During that period of time, particularly in the 1930's, what organizations or societies were you a member of?

A I believe that now towards the end of this period I was a member of two, American Mathematical Society and American Physical Society.

Q During that same period of time of the 1930's while you were at Iowa State, and is it, by the way, customary to call it Iowa State whether it be Iowa State College or Iowa State University?

A It is.

Q So if I shorthand it and say Iowa State, I will offend nobody?

A Certainly not me.

Q At least nobody that you know at the moment. While

there at Iowa State in this capacity as you have been describing it and as you came to teach graduate students, not undergraduate, can you give the Court some kind of an understanding of the type of research projects that you gave them which would contribute to their graduate studies, if you gave them any?

A Well, you see, you know what you did in those days and still, I guess, you set up shop and you offer to take on a graduate student, and you smile at the graduate students and see if any of them will commence to study with you, and if they do, usually the head of the problem might kick a little but pretty soon he will give in and you will have your finger in the pie. And it wasn't long until I had a student by the name of Willson, I believe, and Willson, I was -- this was the theoretical thesis, I mean an experimental thesis. I was a theoretical physicist, but remember I commenced to move into theoretical thesis as well as -- I am sorry -- experimental theses as well as theoretical theses. I will get it straight in a moment. Does the record show something that makes sense?

Well, this thesis that I had Robert Willson working on, and he was my first graduate student, one of the things that interested me was the dynamical properties of quartz crystals, and quartz crystals had received a play since the time of a New England

professor by the name of W. G. Cady as an element to stabilize the frequency of oscillating circuits, and there was much more in this, and I could see this plainly, and I decided we would go into the dynamics of quartz crystals, and I suggested to Robert Willson that we would commence to experiment with quartz crystals to determine what frequencies would oscillate and why it would oscillate at these frequencies and get the general information about crystal dynamics, and that was what Robert Willson's thesis was about.

Q And did he ultimately write a thesis?

A He did. And the title escapes me. I can't seem to pull it out.

Q Do you knowwhether or not that thesis or a reprint of it is among the documents you have brought with you?

A I believe no, but I believe the answer is no. It could be obtained from Iowa State University.

Q Did you have some personal hand in the work or experimentation or whatever you would call it that led to that thesis?

A Yes.

Q What was the character of the work you did?

A Well, Robert Willson and I managed to make the thesis survive and the two of us worked on it pretty

hard, and the thesis got completed.

Q What specifically did you do?

A Oh, I did everything. I designed circuits. During that period the equipment was very very short in the laboratory and I built equipment. For instance, I constructed a cathode-ray oscilloscope from the principles. And during the course of that thesis, and I designed a Miller effect oscillator which was a variable frequency and which could be used to swing the frequency of oscillations so we could swing them past the -- you know it's hard to pick up frequency of oscillation of a quartz crystal because they are narrow and sharp, you couldn't tune it in at all easily, but it's a very simple thing if you had a swinging frequency to, when it swings by the frequency of the quartz crystal, why you would tick it and it would oscillate, and you could pick that up in the electronic circuits immediately, and this was the process that was used here to pick up the frequencies of oscillation, then you could measure them more precisely. So we commenced to measure the frequencies of oscillation and they formed a picture which amazed me at that day in view of the fact that the quartz crystals were used to stabilize circuits, and I found out that the family of frequencies at which a quartz crystal would show some response was about, I remember saying at that day it was about as complicated as atomic spectra.

Q Do you recall the approximate date on which the Willson thesis was completed?

A I do not. I hesitate to do this, --

Q Did you --

A -- unaided. I would think '35, '36, but I can't remember.

Q Can you give us a description of the electronic circuits that were built, as you say, and used in connection with the measurements involved in that thesis?

A I can.

Q Would you do so?

A May I draw a picture to illustrate that?

Q If that would be helpful to you. And for our purposes then may my associate swing the camera a little bit towards the blackboard over here.

A In the first place there was an oscillator.

Q Keep your voice up. You are facing away and the reporter is likely to be lost.

A In the first place an oscillator. I will draw a block diagram. And then there was a buffer.

Q A what?

A Buffer, b-u-f-f-e-r. This is an amplifier which is designed to prevent reaction of the subsequent circuitry upon previous circuitry. And then there was a -- then this thing was passed into a crystal which wemight designate

by some symbol like this, and this is not intended to depict the exact circuit at the moment but merely symbolically detected, to depict that the generation of the oscillator passed into the crystal and then this passed into a detector.

Now, the oscillator was not quite as drawn but it had attached to it a Miller effect circuit, and the Miller effect circuit also contained a vacuum tube which was, I can remember, produced the circuits for him in a moment, I guess, which had the following purpose, to -- you had an input into the Miller effect circuit and an audio input. You understand that meant all this apparatus operated at frequencies which were equivalent to the frequencies of vibration of a quartz crystal and in that range in which radio frequencies, generally speaking, but we put an audio frequency in there from an audio source. That audio source was variable during the course of this. After this detector we came out with two wires and there is more than one there, this is just symbolic, and it went into a cathode-ray oscilloscope like this. And the source, audio source was brought across and passed into the other two plates of the oscilloscope.

Now, I believe that in here we may have had amplication that we came across. We didn't need any amplication, the audio source was plenty high to swing the

scope directly, but the detector may have had an amplifier right in there. I am sure it did. I can see it would be unlikely that it would drive it without amplification. And as a result of this audio source, the frequency generated by the oscillator, and if this is a frequency chart with time frequency, time, then the frequency would vary over some range like that between this lower frequency and that upper frequency, and if in that range from the lower frequence to the upper frequency there was a frequency of response of the quartz crystal, you would commence to see figures on this oscilloscope and the existence of this frequency of response would become evident.

A typical audio source was 60 cycles A.C. and I think we used that more than anything else. It wasn't bad because in the first place you always had it on tap without building any more equipment, and the second place it was about the right frequency. We wanted a rather low frequency to swing the scope back and forth. The frequency was high enough so persistence of the screen made it look as if the signal was continuous but low enough so that it didn't disturb the rest of the circuits unduly.

Now, a typical picture in the screen would look, if there were no frequencies of response, it would look like this, maybe at the center, anywheres in there, there would be a horizontal line which just represented

the swinging of this signal back and forth by the audio source and if there was a signal in there, I mean if there was a response we commenced getting figures which looked more or less like this.

I will draw another picture. And this is a frequency scale you see here because it was caused by the varying voltage here and varying voltage here determined through the Miller effect to be the frequency of the oscillator, and for all practical purposes, that frequency there would be the frequency of response to the quartz crystal.

Q You say the frequency there, Dr. Atanasoff, will you put a figure 2 on the drawing you have been marking on the sheet of paper on the board?

A 2. Yes. Frequency in the center, and I would like to point out that it's a frequency at that point and I will put here the figure 2.

Q Just to identify what you meant by the reference to the figure there.

A Right. Thank you. Now, if you wish, I can attempt to draw out the actual electronic circuits giving details, but this is the block diagram of the apparatus, if no one desires further explanations.

Q The block diagram you say?

A What I call a block diagram because it denotes

function in succession, you see, but I could attempt to get you out a reasonable facsimile of a circuit diagram if you wish. I don't have to remember much except what a Miller effect tube is and that's pretty easy.

MR. HALLADAY: The court reporter has indicated, Mr. Dodds, that he desires to stop ahead of 5:00 o'clock in order to get himself ready for the daily transcript set-up tomorrow. I told him it was quite agreeable with me.

MR. DODDS: That is satisfactory.

MR. HALLADAY: We will quit then, it is about seven minutes to 5:00.

MR. DODDS: Off the record.

(Discussion off the record.)

(Whereupon a recess was taken until November 12, 1968.)

VOLUME II

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

Honeywell, Inc., Plaintiff, -vs- Sperry Rand Corporation and Illinois Scientific Developments, Inc., Defendants.	4-67 Civ. 138

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 2:00 o'clock P.M., November 12, 1968.

(Appearances as heretofore noted.)

Whereupon,

JOHN V. ATANASOFF,

having been previously sworn, resumed the stand and testified further as follows:

(Atanasoff Deposition Exhibit N marked for identification.)

DIRECT EXAMINATION (CONTINUED)

BY MR. HALLADAY:

Q On the record. Dr. Atanasoff, yesterday you drew a picture on a pad of paper here in the room with a block diagram. I think you mentioned it by that name. And the court reporter has now marked that diagram as Atanasoff Deposition Exhibit N in the upper left-hand corner.

Would you look at the diagram as it is now on the board marked Atanasoff Deposition Exhibit N and see if that corresponds to the diagram you were discussing yesterday, and then I will direct your attention to certain alterations that have been made in it by way of making some of the lines a little bolder.

First question, is that the basic diagram that you drew on the pad yesterday?

A Yes, sir.

Q You will have to speak up.

A Yes, sir.

Q And you observe that it has now been marked with

the court reporter's marking Atanasoff Deposition Exhibit N?

A I do so observe.

Q Now, when you were drawing on it yesterday, I believe you were using a crayon-type of a marking instrument, were you?

A I was.

Q And then after that time, you observe that some parts of the crayon marking have been made somewhat bolder, whereas there are initials in the lower left-hand corner JVA, and the date 68 Nov 11 which have been marked over with a felt or similar tipped pen.

A Those are my initials marked over.

Q And were you present when those initials and the date were marked over?

A I was present.

Q Now, referring to Atanasoff Deposition Exhibit N, there are certain words or abbreviations on it that may not be self-explanatory to the ordinary person, so I would like just for the record to get some further reference to those markings.

I am using a kind of a pointer here, which I hope you can see when it lands on the exhibit. I am pointing to figure 60 with a marking immediately after it in the upper left-hand corner of Exhibit N. Do you see to which I am referring?

A I do.

Q What do those symbols there indicate?

A 60 hertz.

Q 60 what?

A Hertz.

Q Spell, please?

A H-e-r-t-z, I believe.

Q And the meaning of same?

A The same as some people call 60 cycles. This is the preferred nomenclature at this time.

Q In the course of drawing, which you may do in the process of your testimony, when you make a mark such as that following the figure 60 on Exhibit N, will that uniformly be employed by you as a convention to represent hertz or cycles?

A Per second. Not cycles, but cycles per second.

Q All right. Then immediately to the right I am pointing to a box with the letters that appear to me to be O's. What does that stand for?

A That means oscillator.

Q Oscillator?

A Oscillator, yes.

Q Immediately below that box with the O's in it is another box with the word or words that appear to read Miller effect. Is that e-f-f-e-c-t?

A Miller effect circuit, you could add, and let it stand at that.

Q Then to the left of the box with the words Miller effect and connected by an arrow running from left to right that I am indicating with the pointer, are words that look to me to be audio source.

A That is the correct nomenclature.

Q Is that a-u-d-i-o?

A It is.

Q And the meaning of that reference on Exhibit N is what?

A That means there is employed for the purpose of this circuit an audio source and the 60 hertz above means that quite frequently in our experimental work we employed a 60 cycle source for our audio.

Q And when you say audio, what do you mean?

A It means a relatively low frequency.

Q Of what?

A Current, of electricity.

Q Not of sound?

A No, it does not, and this is an electrical diagram, and any sounds depicted -- of course, there really is some sound inside the quartz crystal but I have not named or enumerated it.

Q But in any event, the reference to the word audio

here is not intended to reflect a sound which would be heard by a human ear?

A A good point. That is correct. That is correct.

Q Then on Exhibit N, the next box following that label O's, is a box to which I am pointing marked buffer?

A Yes.

Q Would you please state what that means?

A We might correct it to mean buffer amplifier although it is frequently used in its present form, and that is a vacuum tube circuit which is intended to prevent the reaction of the crystal circuit upon the oscillator.

Q Intended to --

A Prevent the reaction of the crystal upon the oscillating circuit.

Q Then to the right of the box marked buffer is a symbol that looks like, and to which I am pointing, to my eyes, at least, an upright rectangle with two parallel lines left and right thereof. Have I for our purposes sufficiently described the appearance on this chart?

A Your description is correct and it is a more or less conventional symbol to denote a quartz crystal in a circuit -- a crystal in a circuit, pardon me, correction, a crystal in a circuit.

Q In the instance of the depiction on Exhibit N, for November, is that conventional symbol intended to

represent any crystal or a particular kind of crystal?

A The witness is undecided how to answer this question.

Q In describing the work to which Exhibit N relates, is the symbol on Exhibit N for a crystal referable to a quartz crystal or any crystal?

A I can only describe the facts. As usually employed, a quartz crystal resided in that box, but on occasions other crystals also resided there, so what shall we say for the record?

Q With specific reference to the work which you were describing yesterday done by you and Mr. Robert Wilson, is the depiction on Exhibit N intended to reflect the position of a quartz or some other kind of crystal?

A Read my last answer back. Exactly, that's the answer and the only answer I can give.

Q In other words, you are telling me that experimentation, if that's the proper term, was done with crystals other than quartz?

A Right.

Q What -- was the quartz crystal the subject of the thesis?

A It was the principal crystal employed, yes, that is correct.

Q Continuing from left to right on Exhibit N, for

November, there is another box with the letters in it that I believe are Det. Is that a correct reading?

A That is a correct reading.

Q And those letters stand for what, sir?

A Detector.

Q And interpretation of that word is what?

MR. HALLADAY: Just a moment.

(Short recess taken.)

BY MR. HALLADAY:

Q The question was intended to be this way, a description of what you mean by the reference Det. for detector on Exhibit N?

A May I use -- may I make additional drawings upon that sheet or another sheet of paper?

Q Can you just give me verbally an explanation --

A Sure I will.

Q -- of the detector?

A Now, what comes, what reaches the point of the circuit there is a combination of audio frequency modulated by -- a modulated alternating frequency. We want to read the amplitude of this quantity, irrespective of the radio frequency oscillations, depending upon the audio frequency oscillations. For that purpose, a detector is employed. This term is employed in its normal sense in radio frequency circuitry.

Now, just a moment. For the sake of the record, let it be recorded that this is not a frequency modulating -- not a detector of frequency modulation but a detector of amplitude modulation.

Q Well, in any event, as a detector, I have an impression as a layman what that means, but I don't have a statement from you of what it detects, if that is a proper use of the term.

A It detects -- into it goes a modulated radio frequency. Out of it comes the amplitude measurement of that radio frequency. It is a device which creates this conversion. Do you wish further information on the device?

Q What mechanisms does the detector employ to do that?

A There are many, there are several mechanisms which are --

Q Can you give us a description of the one that was employed in the device that you were using in the experimental work with Mr. Wilson that led to the thesis? I'm speaking of a physical description.

A I think it is fair to say that I could make an effort in this direction, but it would not be a certain one in my mind and I prefer not to make it.

Q Did it employ vacuum tubes?

A It did employ vacuum tubes.

Q Do you recall what kind of vacuum tubes?

A I do not recall.

Q What make they were?

A No.

Q What number they had?

A No.

Q To the right on Exhibit N of the box marked with the Det. are two lines drawn transversely and then downward toward a round appearing object that I am outling with the pointer. To the left of that round object is another line running laterally and then upward, as I trace it, which has some marks superimposed upon it.

A It means erase -- those marks mean erase that line.

Q Then the other two lines that flow from , if I may use that term, or go from the Det. symbol outward toward the right and then downward, as I am tracing here with the pointer, the two lines in question, do you observe the tracing that I am attempting to employ?

A I observe.

Q Are those wires or something else?

A I would only like to add one fact. Inside of the -- along those lines is another box which I labeled Amp., and which is intended to designate an amplifier. Then following these lines, these lines mean wires, and these are the wires which come down and attach to the vertical plates of the oscillograph tube.

Q Then pointing to the box on Exhibit N immediately to the right of that label Det., there is a line or a series of letters drawn transversely in that box. Do I understand that is Amp.?

A Yes, amp. meaning amplifier.

Q And then immediately below this round object to which I am now pointing on the extreme right of Exhibit N, what is that object?

A This --

Q The round object itself that is in a circle?

A Oh, that?

Q The one to which I am now pointing.

A Oh, I see. That is designed to depict the cathode-ray tube.

Q Would you be good enough to put some kind of a symbol on there such as a Crt. to show the position of the cathode-ray tube?

A Should I put the date, the day on those symbols?

Q It won't be necessary, as far as I am concerned, Dr. Atanasoff, at this time.

Cathode-ray tube is a term which you have employed. Earlier in your testimony I thought I heard the word oscilloscope. Now, tell me, did I hear that word or did I imagine it?

A You hear most everything and you heard it and I am

guilty, and we use the word cathode-ray tube and cathode-ray oscilloscope somewhat phenomenously. Strictly speaking, the cathode-ray tube means just the vacuum tube employed in the cathode-ray oscilloscope, but we get the words, those words mixed up, and you can catch me at it.

W-1-
part 2

Q Please be seated. In the description of the work which you did as to which you drew this illustration in the form of a block diagram, did you buy or build an oscilloscope or did you do neither?

A We built an oscilloscope.

Q Continuing with Exhibit N, over on the left-hand side is a vertical or more or less vertical line intersected by a horizontal or more or less horizontal line. If I am incorrect, please correct me. At the top of the vertical line on the left-hand side of the chart, Exhibit N, is what appears to me to be a letter, is that correct?

A That is correct.

Q What is that letter to which I am now pointing?

A The letter F.

Q And then at the end of the horizontal line on Exhibit N is another marking which also appears to me to be a letter.

A The letter T, denoting time.

Q The F then stands for what?

A Frequency.

Q And the T stands for what?

A Time.

Q And what is this representation on Exhibit N supposed to show that is marked by the vertical line, the horizontal line, the F and the T, and then an up and down line, if I may call it that, near to the vertical line?

A The sinusoidal representation --

Q The what?

A The sinusoidal representation, the sinusoidal curve in that picture is designed to denote, not strictly in a Fourier sense, that the frequency is changing with time, as shown between a lower limit where the lower horizontal line is drawn and the upper limit where the upper horizontal line is drawn.

Q You speak to a lower horizontal line. Is that the one --

A Yes.

Q -- nearest to the F?

A Yes, it is.

Q At the bottom of the sinusoidal --

A Yes.

Q -- curve. And the other horizontal line toward the top of the sinusoidal curve?

A Yes.

Q And I say sinusoidal, forgive me if it is sinusoidal.

A It sounds fine. It sounds fine either way.

Q Further to the right on Exhibit N is another circle which has merely two parallel or more or less parallel lines inside of it, to which I am pointing. What is that intended to depict on Exhibit N?

A That is -- that was intended to depict the state of the trace upon the cathode-ray oscilloscope when there was no crystal present or when the crystal was being subjected to a range of frequency within which it had no responses.

Q For lay purposes, Dr. Atanasoff, would it be inappropriate, in your judgment, for the lay person to think of a cathode-ray tube as giving roughly the appearance of a blank television screen, just to think about it for a moment?

A Of course, a cathode-ray tube and a TV screen have a relation. They are both cathode-ray tubes. One is deflected by electrostatic influences, the other by electro -- by magnetic disturbances. Now, I don't know whether it's correct to say that since there's no signal present, now, if there's no signal present in a TV tube, if my memory serves me correctly, and I haven't spent too many hours watching TV tubes, I avoid it whenever possible, do you get a complete raster in which light fills the screen when there is no signal there.

Q All I am thinking of is the general physical

appearance.

A But here we have two horizontal lines. The upper one -- these lines are not to be regarded as concomitant. They are to be regarded as alternates and either the one or the other, depending on the state of the circuit and some other factors there and the type of detection that is being employed and other factors, it means there's some horizontal lines being drawn on the tube; and that concludes my explanation of the device, of the picture which you wished.

Q Then with respect to the circle with the two parallel lines in it, is that intended to reflect the appearance of the cathode-ray tube at any instant or merely as an illustration, or how would you say?

A It's meant to show the appearance of the cathode-ray tube with the persistence of screen and vision acting -- with the persistence of screen and vision acting at an instant, and as I stated before, those lines are alternates to each other. It will be one or the other or somewheres in between. There will be a horizontal line. I shouldn't have drawn two lines. I have to make too much explanation about it. Now, that is when there is no crystal present or when there is a crystal present which has no responses in the range of frequencies depicted in the graph at the left, the graph being spanned by the coordinates for F and for T.

end

KL=XX
22z
11-12-68
-1-KL=1
WXS.

Q Then to the extreme right of Exhibit N is another circle with what, for want of better vocabulary on my part, I would speak of simply as a curving line, also marked with a 2. Do you see that object on the exhibit to which I am pointing?

A I do.

Q Now, what does that depict on Exhibit N?

A That depicts a typical but not exclusive form that the picture takes when there is a response of the crystal within a range of frequencies which are present as excited by the audio source in the oscillator which drives the buffer amplifier and then the crystal.

Q And again, item Number 2 on Exhibit N depicts a schematic representation of what kind of a device?

A The cathode -- the picture on the cathode-ray tube.

Q During the years at Iowa State when you were teaching graduate students, did you have any work which you did in connection with IBM punched-card equipment?

A From my earliest years at Iowa State College, now University, I was interested in the IBM punched-card equipment which was there at least as early as I was, to wit, the fall of 1925.

Q Directing your attention to the time at which, while at Iowa State, you were teaching graduate students, did any graduate students work with you in any special application of the use of IBM tabulating equipment?

-2-2

A Not in the normal sense, no.

Q Did you work with one A. E. Brandt?

A I did.

Q Did you work with Mr. Brandt or he with you in the use of any punched-card equipment?

A Both.

Q Will you describe the character of that work, plea

A Well, my interest in IBM punched-card equipment, si it represented the largest computer on the campus, was inten and I commenced to try to find ways to employ this computing equipment for other things. The problem which I hit upon w a possibility of employing an IBM tabulator to analyze compl spectrum, spectra.

Q Was the result of this work the subject of the thesis?

A It was not.

Q Do you recall any publication pertaining to that w

A It was published. It was published, yes.

Q Do you recall where the publication took place?

A I believe it was in the Journal of the Optical Society.

Q And who were the authors, if you can recall?

A The authors were Atanasoff and Brandt.

Q And Brandt's name was what?

A A. E. Brandt.

2-3-3

Q B-r-a-n-d-t?

A Oh, I am sorry. Correct.

Q While you were at Iowa State in the capacities that you have described, but I am now directing your attention to your work with and teaching of graduate students rather than any prior periods or different periods, what other kinds of mathematical problems in a general way did you have to deal with?

A My -- There were a series of problems directed towards the approximate solution of differential equations.

Q Do you have now, so that you can call to mind, the names of any graduate students with whom you worked in these respects?

A Yes.

Q Will you state those names?

A Messrs. Gross, Cook and Thorne.

Q Mr. Gross' first name?

A George.

Q Mr. Cook's first name?

A Roy.

Q And Mr. Thorne's first name?

A Charles, I think. I think. I am not sure.

MR. DODDS: What?

THE WITNESS: I said Charles, but I am not sure. I could be wrong on this. I don't know

2-4-4-

about that.

BY MR. HALLADAY:

Q Of those three whom you have named, do you know whether they are all yet alive?

A Mr. Cook is deceased.

Q And do you know the whereabouts of Mr. Gross?

A I do.

Q State it.

A It is in Long Island somewheres. I will have to do reference to get the exact address.

Q And Mr. Thorne's whereabouts?

A Mr. Thorne is at Point Mugu. At my last knowledge was at Point Mugu in California.

Q What in a general way was the character of the work done by Mr. Gross?

A Mr. Gross was, did two theses, a Master's thesis and a Ph.D. thesis, and it was the purpose of these theses to formally outline some methods devised by my graduate students, and, of course, as is usually the case, to some extent by myself for the approximate solution of differential equations; such methods comprising in special cases some old standard methods in the approximate solution of differential equations and problems employing differential equations employing perturbation theory as applied to differential equations, these older methods being characterized by the names of Rally, Lord

--5-5KL

Rally, Ritz, R-i-t-z, and Trefftz, T-r-e-f-f-t-z, I believe.

Q What was the character of the work by Mr. Thorne?

A Mr. Thorne's work was along the same line. He had a special problem in this area, and I am slightly uncertain, I would have to do a reference to Mr. Thorne's thesis, I think, to tell what his exact problem was.

Q What was the work of Mr. Cook?

A I remember that Mr. Cook had problems in the same area, the approximate solution of differential equations, but his work turned more to the actual application of the methods and outlining the formal nature of the methods. I believe this is true of Mr. Thorne, also, but I couldn't remember the problem. But in Mr. Cook's case, I do remember that the problem related to an elastic plate upon some kind of a foundation, and I don't remember the exact conditions.

Q In connection with those theses, can you describe for us what, if any, mathematical problems there were that required the spending of time or effort, thought?

A We were at that time restricting ourselves to linear differential equations. However, this doesn't mean ordinary differential equations, they were linear, and the linear differential operators are characterized by a, by a formula. May I put the formula on the board?

Q If it would help you in testifying.

A I believe it will.

2-6-6KL

Q Let's try to remove that exhibit without damaging it.

A May we just turn it back?

Q May I help you?

A Let L a phi, written this way, denote -- this will be available -- denote a linear operator. This operator may be either a differential operator or any other operator which is linear. The linear principle is characterized in the following way: We use the square brackets here with a forethought, because inside of them is not a number but a function, so this is really a function of a function, in character. I now state the linear principle.

Q Will you describe in words -- and I hope by interrupting you this way I don't interrupt your train of thought.

A No.

Q Will you describe in words, please, the symbols you have now put on the pad?

MR. DODDS: Just a minute. Mr. Halladay may I inquire as to what the relevance of this rather long and protracted examination of Dr. Atanasoff who has worked with graduate students in the early and middle 1930's to any issue in this case?

MR. HALLADAY: I submit that it will appear.

MR. DODDS: Well, I register an

2-7-7KL
WS

an objection because I think it's just deliberate and an unnecessary and protracted expansion of the record to accomplish no useful purpose. I will like to have that objection be understood to continue until we approach something relating to Dr. Atanasoff's work in the computing field.

BY MR. HALLADAY:

Q Will you answer the question or do I repeat it?

A Well, I can make an answer. I am not sure if it will satisfy.

Q I am not asking you to answer Mr. Dodds' objection.

A I am sorry. I am sorry.

Q I am asking you to answer my question, which at the moment is merely for instructional purposes, and that is for the benefit of the record if you would say in words what the second line is off this chart that you are working on now?

A L followed by square brackets is intended --

Q No, no, you are misunderstanding the purport of my question. I simply want an identification. First, there is the letter "L"?

A Right.

Q Next a square bracket?

A Right.

Q Next a symbol and I want the name.

2-8-8

A Called Phi, and in society --

Q Excuse me.

A -- Phi.

Q A Greek letter?

A A Greek letter.

Q P-h-i?

A Thank you.

Q And then a next symbol?

A An algebraic plus sign.

Q And the next symbol inside the square brackets is what?

A A Greek letter, Psi, or Psi, depending upon the point of view.

Q P-s-i?

A P-s-i.

Q Then a closed square bracket?

A Right.

Q Then an equal sign?

A Yep.

Q And then, again, the nomenclature would be the same on the succeeding portion of the second line?

A I agree.

Q You will have to make an audible response.

A I agree. I agree.

W-2-2

Q All right. Now, particularly having in mind Mr. Dodd's statement of an objection, Dr. Atanasoff, the beginning of this question which prompted you to write on the pad was to elaborate on mathematical problems that were involved in the work you and your graduate students were doing?

A That is true.

Q And then I gather you were attempting to illustrate those problems by the use of the board, is that a fair way of putting it?

A To describe those problems, if you please.

Q With nothing more before us than we have on the pad, can you describe in words where one went, in a mathematical sense, to solve the problems that were before you and your graduate students during this period that we are talking about?

A I can.

Q Would you do so?

A Now, if the differential or other operators L possess a property given there which is generally called linear, but is called Banach additive --

Q You will have to bear with us, and you used a term which was not, I think, clear to the reporter.

A A name, Banach, B-a-n-a-c-h. He was a Polish mathematician. If this is true, then in the approximate

methods which we devised, there will appear a system of linear algebraic equasions which it will be required to resolve and linear algebraic system which it will be required to resolve in order to reach numerical values for the approximate solution.

Q And you use the term "a system of linear algebraic equasions." Would you please define for us the meaning of that term?

A May I use the board?

Q Can you do it without reference to the board, please, to the best of your ability?

A Well, the term linear algebraic equasion is one that is known very well in high school. It consists in having at hand a number of unknowns, say X1 to XN. It consists of having at hand a number of co-efficients, say A1 to An, B1 to BN, C1 to CN, and so forth, until we have as many equasions as we have unknowns.

Q If we were to number them togive us lay people a grasp of the proportions, would it be illustrative to say you had a certain number of unknowns that you might be dealing with --

A Yes.

Q -- in a set or system of linear equasions?

A In the explanation was giving you, there are N unknowns and it was required, also, that there be, normally.

Now, this is not an absolute requirement in the resolution of linear systems. There are some peculiarities which would avert this situation, but normally there will be a number of equasions equal to a number of unknowns.

Q So, if, just for illustration, we had 15 unknowns, in giving us the number of equasions to deal with for this illustration, how many would you be talking about?

A Usually, as I state, the problem is presented with a number of unknowns and a number of equasions being equal. Is this responsive? I am not sure.

Q I am simply asking for illustrations.

A Oh, do you mean -- here, for instance, I could give you these two equasions, 2X plus 3Y equals 7. X minus 7Y equals 13.

Q And that would be how many equasions representing how many unknowns?

A This would be two equasions and two unknowns.

Q Would that be a system of linear equasions?

A It would.

Q In dealing with such equasions and arriving at approximate solutions thereof, what would the problems be of solving the same in a mechanical or mathematical way?

A Well, students in high school solve them with

two or three unknowns and quite readily by the methods presented in elementary algebra. This is all right. Then we have an approach to this problem involving determinants that was presented by the gentleman that we have discussed here whose name is -- please --

MR. DODDS: Hazeltine.

THE WITNESS: Hazeltine, an approach to the problem given by Hazeltine involving determinants, this gives us a formal solution but not a numerical one because the problem of evaluating the determinants and the problem of solving the system of equasions are roughly problems of the same character. So we are generally faced with hard shoveled digging of a numerical mathematical type in order to come out with numerical answers for the unknowns.

Now, this, I think -- I remember calculating how fast this effort goes up as the number of unknowns and number of equasions rises.

BY MR. HALLADAY:

Q When did you do this calculating?

A Some time in my past and during these years we are describing. I am now employing my memory as to how fast it goes up, but my memory is that it goes up as the cube of the number of unknowns. That may not be quite right,

because as the number of unknowns increases, the chance of error is greatly magnified.

Furthermore, the difficulty goes up according to the accuracy with which the solutions are required, and usually in, as a system gets larger and larger for some practical, because of some practical aspects of numerical computation, it becomes necessary to carry more and more decimal places. So I suspect that the rate of rise of the difficulty is greater than that specified.

Q In working towards the solution of such problems involving systems of linear algebraic equasions, Dr. Atanasoff, did you personally do this work?

A I have on equasions personally done this work, yes, sir.

Q During the time when in 1930's and prior to 1940, you were at Iowa State, did you personally involve yourself with the numerical difficulties of solving these systems?

A No.

Q Who did?

A My students.

Q Did you during that period of time direct your attention to any effort to simplify the solution to these problems?

A I did.

Q Can you describe for us in which respect and to what end you directed your attention?

A As the problems which we attempted became more and more complicated, as the number of degrees of freedom in differential systems and/or integral systems which we approached became greater and greater, the number of unknowns and the number of equasions became larger and larger; this being the case, if we sought to get any reasonable approximation to the answers to the equasions, and around our neck was a great weight, and I was faced with the necessity of some resolution of this difficulty.

W-3-1

Q What did you do about it?

A I commenced an examination of the types of numerical aids which could be brought to bear upon this problem.

Q Will you please explain what you mean by that?

A Well, I didn't want people sitting up using a standard calculating machine. IBM machines as they stood would not be of any aid, it generally resulted in those days, not only in the case of the approximate solutions I was doing, but in many other problems around the University, it generally was the state of things that somebody with, at best, a Monroe or Marchant or similar machine was sitting still at a stool and making these calculations by hand.

Now, I attempted to examine the possibility of using a variety of schemes to get a reasonable solution. At first, I attempted the solution in terms of analog methods. There existed in those days analogs for the solution of systems of equasions. These were employed by power companies to solve the system of equasions which arose in connection with large power transmissions, complicated power transmission networks. They were called setup boards. There may be another name, but I don't know it.

Q What else did you examine?

A One other immediate effort was an attempt to transform the IBM tabulator. You see, I had in mind my memory, my memory of the efforts of Brandt and myself in which we transformed the IBM tabulator into a device of different intelligence which was capable of analyzing complex spectra. I therefore set about to find ways to convert the IBM tabulator for the purpose of solving systems of equasions, the number of unknowns and the number of equasions being sufficiently large so that they would be attractive for the purposes which I had in mind.

Q Can you give us a description of that transformation of the IBM equipment that you engaged in?

A Well, not a very good one because I haven't reviewed that in recent years, but it simply consisted in deciding how

many, how much computing capacity which we had in the IBM tabulator, and the IBM tabulator which was at our hand had 40 significant figures capacity total. You see, an IBM card has 80 digits thereon. Well, it had only 45 in the earlier years and then they changed cards and it went up to 80, and so our tabulator in these years we are talking about had 80 places on it, 80 -- capable of handling 80 base ten digits, and the -- but the calculator itself only possessed 40 counters, so that it was practically limited to 40 places, and I attempted to divide it up and to devise auxiliary equipment so that inner actions between the machine containing a number, containing a series of numbers which represented the co-efficients and/or constant term of one equasion and another equasion whose co-efficients were printed on a punch card so the machine could carry a punch card through and through and through again, in effect, until one of the unknowns would be eliminated from the registers.

Q Do you now recall from your memory when it was that you engaged in this work?

A It seems to me that it was the years between '35 and '37.

Q Did you during those years consider any other methods of mechanizing or making more rapid these computations that were then before you?

A I did.

Q Will you describe those others?

A I am not sure. Do you mean all others?

Q As many others as you can call to your mind.

A I recall no others to mind except my main effort in that direction.

Q Andyour main effort, can you describe that in a general way preliminarily to something more detailed?

A I can.

Q Will you do so?

A It soon became evident to me that I was getting nowheres with this approach to the IBM tabulator. The computable capacity of this device in no wise sufficed even if I had had the largest IBM tabulator in existence, which, of course, would have 80 registers in place of 40. You see, I was thinking in terms of 10, 15, 20 and more unknowns, and you know the IBM tabulator of that day had in no wise a floating decimal. So that when you had put a number upon the IBM tabulator, it might, in effect, in the course of manipulation consequent to the attempt to solve the equasion, run off the dial, so you needed larger number of significant figures in each place. With only 40, if we tried to divide it by eight, thatwould be only five significant figures in each field and this would in no wise suffice for the accuracy and for the eventuality of running

off, running out of the field, and 8 was by no means large enough to permit me to approach the problems towards which we were moved. I therefore commenced to search for other computing means of a kind unknown at that time.

Q Can you tell us where those searches led you?

A Well, they led in the direction of my direct effort in computing elements. Is that the answer that you --

Q Then describe what those direct efforts were.

A Well, I commenced to scrounge around the computing machine field with my background and knowledge and attempt to locate mechanisms which would be suitable for the purpose.

Q What did you scrounge around and find?

A Well, one of my first efforts related to the possibility of gang, of a great many Monroe or Monroe-like machines together, operated by common shafts, manipulated by common controls, so that they, so that upon each computing machine could be put the co-efficients of, the various different co-efficients of one equasion, this being placed upon the counters of that machine and the co-efficients of another, of the two equasions, on the second of the system of equasions being placed upon the keyboard of said machines, inner actions between these two taking place, with the purpose of accomplishing the reduction of the practical problems and solution of the linear differential systems.

Q Describe anything further that you explored in this respect?

A Well, I may say that this effort was soon aborted because it became practically impossible to conceive of the effort of placing the numbers on the computing machines, and I was driven to further purposes, further efforts, and I decided that at this time it would be necessary for a systematic effort to be made in direction of finding new and original computing elements suited for this purpose.

Q Describe what you did in that respect?

A Of course, I am very familiar with the material and my only delay relates to relating this material in a way that is responsive and useful. I, of course, was familiar with the computing elements employed in an IBM tabulator or in computing machines in general and the like, and it was rather clear to me that if I attempted to duplicate this material, I would be in a position close to that which I faced in connection with the employment of either the IBM tabulators or the Monroe calculators. The -- I have said, I say again, I commenced searching for basically new elements and I just couldn't employ any of these old elements, and with this decision, I came to suspect that in the end mechanical methods would not suffice for this purpose.

Another thought which occurred to me at the time

was the possibility of the simplification of the calculating process by the employment of other bases than 10. I recognized that the work necessary for the conversion of the numbers to another base was small compared with the work necessary in solving this system of equasions. This work obviously went up with N instead of a higher power of N, and I stated that the higher power of N was 3 or greater. Previously, I believe I stated that. So the problem of converting the numbers from other bases, I mean from base 10 to other bases and converting back in no ways becoming -- as the systems got larger and larger, became a smaller and smaller part of the overall problem. At first, I wondered if the correct answer would not be to increase the size of the base, and for a few days a basis like 12 and a hundred whirled around in my head. Of course, that didn't last long, and almost at once I was driven downward to lower basis than 10, to seek an advantage. I made a kind of a summary of a typical numeric operation employing other basis than 10, some kind of a calculation to see what base would be most advantageous. I will pass through the -- the equasions were simple enough to solve and I came up with the base -- in that calculation, I came up with the base E.

Now, the base E is not a very handy base for use in numbers. I am not quite sure

as I sit here whether it is possible to use a base E. Most people would say not. I am not absolutely sure that it's impossible, but it is of no use at all, I am sure of that.

So I had to approach the problem by using the base 2 or the base 3. The calculation which I had, the form of the equasions which I had led to this same speed for base 2 and base 3, but almost immediately mechanical considerations eliminated 3 and moved me towards base 2.

Q Having gone that far, Dr. Atanasoff, what, if anything, did you turn your attention to with respect to the accomplishment of the calculations in question?

A I hope you can rephrase to answer in other words. I do not fathom the meaning of the question.

Q Well, you have eliminated, as I understand what you have said, mechanical devices of the kind reflected by the IBM calculating machines or a gang or team of Monroes, to use my kinds of words, if I have understood what you have said so far. Is that correct?

A I believe that that represents the general tenor of my feelings.

Q What else did you think about to do the work that you had decided could not be done by a gang of Monroes?

A Well, I commenced attempting to depict the computing machine in a practical way and I had to secure elements for the purpose at hand, and the elements which I fixed upon were, at first were several. When I had decided upon base two as a practical base for a calculating machine, I was searching for elements which are capable of remembering base two numbers and entering into the calculation with structures which were suitable for entering into calculation, and these numbers and practical computing machines had historically been called counters and I wanted a new name for them and I came up with the name abaci elements.

Q A-b-a-c-i?

A Right, and abaci elements were just elements taken from the counting devices. The abacus, of course, means the conventional Asiatic calculating device which is known to all, and I used that word because it was, it didn't so readily enter into the thinking of the people in this country so that they would think about what the meaning was and perhaps I would get a clearer transmission of thought. This is the element which holds a number and which -- it comes into inner relation with the counting mechanism and allows the calculation to take place in the number, and for these elements I was then considering a variety of structures, such as a little mechanical movement.

3-2-2-10

While I expected the electrical -- while I expected the calculations would take place in electrical terms, at this moment I was even considering mechanical elements for the abaci elements such as the little clicker which would be in one of two positions, which would take two positions. We needed an element which had, from a purely theoretical point of view, we needed an element which would take two states, and if we are going to use base two numbers, instead of taking ten states as the rollers -- as the dials of a base ten calculator would, and I thought about such little mechanical snappers, a pin which moved in and out, a lever which moved across and locked in either position and was moved by auxiliary apparatus, and I presumed that this would at first be mechanical, but eventually electrical in nature. I also took into account two electrical phenomena, considered two electrical phenomena, electromagnetic phenomenon which would be brought into play, and one of these was the state of magnetization of a small piece of thorough magnetic, permanent thorough magnetic material. In the case of a piece of thorough magnetic material, the material could be either magnetized this way or this way, and this would represent the two states which were necessary for the depiction of the elements of the base two system.

I also brought into consideration the possibility of employing a condensor. I knew the condensors would be

3-2-3-11

somewhat leaky, and at first I hoped that the calculations could proceed while, before the charge leaked down. Our quality control on condensors was not too good in those years. However, the period of leaking down was relatively slow. Another problem faced me which was third going to the problem; that is, that when I read the condensor I intended to destroy the state of charge of the condensor, so this became a basic problem, and at first the condensor did not rate a very high grade in my evaluation of abaci elements.

Q In your discussion, Dr. Atanasoff, you've said something and made a gesture which may not be meaningful when we have the typewritten transcript. I am directing your attention now to your discussion on the direction of charge, if I may put it that way, on a thorough magnetic element in which you said this way or this way, and you used your fingers in saying that.

A I'll put that in words suitable for transcription. You have an element of thorough magnetic material. I refer to the states of magnetization of this thorough magnetic material. Now, obviously, you don't have to have -- you need to have two states which can be separated by the auxiliary apparatus which you are employing. These two states do not have to be opposing states of magnetization, but perhaps the simplest two states is represented by the case where we do take a little small linear piece of thorough magnetic material

3-2-4-12

and magnetize it so that the North Pole will be at one end of the piece in the case of the zero of the base two number system, and be at the opposite end in the case of the one when it is representing the one of the base two number system.

Q When you speak of the north end, that makes me, of course, think of the south end, and then I wonder whether north is positive or negative and whether that's a sensible question.

A Well, there is a resolution of this question as you ask it, but it escapes me at the moment and I can't give you the answer. I don't know whether -- I guess north is usually called positive, but I don't know. It doesn't make any difference, it's nonsense to call north positive, anyhow, so I refuse to be a party to that.

Q In any event, when you spoke of this way or this way and used your left hand and your right hand with the four fingers opposing each other, what did you mean by that gesture, appropo this question of magnetic --

A I meant the state of magnetization in this elemental piece. At that moment, I was thinking of it being in a given direction or an opposite direction thereto.

Q Then you spoke of condensors. What do you mean or did you refer to at that time as a condensor?

A A condensor is an elemental device suited for retaining an electrical charge. It consists of plates of conducting material, usually metal, closely spaced and usually

3-2-5-13

EA
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a dielectric between them, with usually a plate of dielectric material between them.

Q What else did you consider during this time in connection with your work on, if I may call it this, a base two approach?

A I am uncertain as to the intent of the question?

Q I didn't hear you?

A I am uncertain as to the intent of the question? I cannot answer it this way.

Q All right. You have described a thorough magnetic element, condensor element, something that I think you called a clicker or at least I heard that term. You have referred to a needle, and I am asking you whether there was anything else in this work that you were doing or the thinking you were engaging in?

A You mean as the abaci elements for the future work, is that the question?

Q Yes.

A I presume there was one but I have forgotten it.

Q All right. Did you while considering these matters actually experiment with physical objects of the kind you have been describing here?

A I believe it is a fair statement that I followed the limitations of my trade and conducted my investigation by armchair methods in the main. This is not to say that at certain

stages that some rudimentary experiments were not performed. I remember, for instance, in connection with condensors where you couldn't quite foresee what the limitations -- the practical limitations of a condensor would be, this is -- progress could only be made by experimental methods so we turned to experimental methods and measured the time charge -- time of discharge of condensors when they were charged to various degrees of intensity.

Q During that period of time, did you ever see or have any exposure to something called a cosmic ray counter?

A I did.

Q Where was that and what was the character of the exposure?

A Well, I can't tell you exactly where it was but just at that day cosmic rays were pretty much a fashion, many of the most important physicists were working in that field, and the periodical literature, professional periodical literature had reference to this work and one of the devices that was being employed there was a scale of 2 counter for the purposes of counting the cosmic particles which entered a portion of space. This I remember now was another element which I had considered as an abaci, namely, an electronic circuit which had two states and was capable of representing, thus capable of representing a zero or one and which was a potential runner-up as an abaci element.

1-1-2-15

MR. HALLADAY: It's now 3:24, would it be a convenient time for the afternoon break to be taken at this time?

MR. DODDS: All right.

(Recess taken)

(Atanasoff Deposition Exhibit O marked for identification.)

MR. HALLADAY: All right.

BY MR. HALLADAY:

Q Dr. Atanasoff, during the recess, will you observe that your latest markings on the pad on the board have now been labeled by Mr. Anderson, the reporter, as Atanasoff Deposition Exhibit O?

A I do observe it.

Q And I am going to remove that from the board and go on to something else.

MR. HALLADAY: Will you mark this exhibit P for identification.

(Atanasoff Deposition Exhibit P marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, earlier in your testimony you had made reference to a work by a Mr. Gross in connection with a Master's Degree and in connection with a Doctor's Degree, I believe, and I am now just going back to that for a moment.

4-1-3-16

I have just received from Iowa State College a bound booklet imprinted on the exterior, "Approximate Solution of Linear Differential Equations, Gross," with the library identification book number, "QA372," subheading, "G914a; Accession No.T5566." Then I am asking you to look at the title page and see if it bears an original of your signature?

A It does.

Q Does that represent a file copy of the thesis of George Lloyd Gross submitted for the degree of Master of Science?

A It does.

Q Was that one of the theses to which you had earlier referred in your testimony?

A It was.

Q Do you recognize that as one of the copies that was passed through your supervision during the time that Mr. Gross was a graduate student under your general tutelage at Iowa State?

A It was.

Q And I also have received just now from Iowa State a bound book entitled, "Gross Thesis 1939," on the cover with the library identification as book No. "QA320," subhead, "G914u, accession No. T6203," and I direct your attention, Dr. Atanasoff to the title page which has the caption, "Use of Functionals in Obtaining Approximate Solutions of Linear Operational

4-1-4-17

Equations by George Lloyd Gross," and ask you if that bears an original of your signature?

A It does.

Q Do you recognize that as one of the copies, at least, of Mr. Gross' thesis submitted to the graduate faculty in support of his application for the degree of Doctor of Philosophy?

A It seems to be.

Q Was that submitted under your general tutelage while he was a graduate student at Iowa State?

A It was.

MR. HALLADAY: Now, Mr. Dodds, this had been the only way I knew to obtain these for these purposes. I have not asked, but I assume Iowa State would object to any further marking of the library copies of these theses. I have identified them so that I believe that any changes would be reflected, and I would like, without marking them, simply to ask your consent to have them copied either by the reporter or under such other auspices as we can arrange. You may, of course, check any copying we do against these originals and then I will return the originals to the library where they belong. They are charged out, in effect, jointly go Dr. Atanasoff and to me.

MR. DODDS: That's agreeable.

4-1-5-18

MR. HALLADAY: All right. Just for further clarification, Dr. Atanasoff, would you indicate for the record that the Master thesis by Mr. Gross is bound in --

THE WITNESS: Brown.

BY MR. HALLADAY:

Q Manila-colored or tan buckram?

A I do so.

Q And the Doctorate of Mr. Gross is bound in blue?

A I do.

MR. DODDS: Could I see the blue one?

(Document handed to counsel.)

MR. HALLADAY: It is my purpose in avoiding marking the originals of these two theses to mark respectively the Master's thesis as Atanasoff Deposition Exhibit Q, that is to say the copy, and the copy of the Doctorate thesis by Mr. Gross as Atanasoff Deposition Exhibit R. If the reporter will be good enough to reserve those numbers we will go on.

BY MR. HALLADAY:

Q Dr. Atanasoff, I show you a two-page document that has been marked Atanasoff Deposition Exhibit P, can you identify that?

A This is a publication of an extract of the Doctor's thesis by George Lloyd Gross in the Iowa State College Journal,

4-1-6-19

and I believe they call it Journal of Science, but the exact title of that publication escapes me at the moment.

Q Was that publication on or about the date that that document Atanasoff Deposition Exhibit P bears?

A It was. Yes, it was.

Q And do you know of your own knowledge that the publication reflected by the Xerox copy that is marked Exhibit P was in fact published and circulated locally at Iowa State in 1939?

MR. DODDS: Just a minute. Just a minute. I think that question is very objectionable for leading, a leading question.

BY MR. HALLADAY:

Q You may answer?

A I would like to have the question read.

MR. HALLADAY: All right. Mr. Anderson, would you do the necessaries?

(The question was read.)

THE WITNESS: I remember that such a publication in the Iowa State Journal took place in regard to Gross' thesis.

BY MR. HALLADAY:

Q Do you recall the year?

A I do not recall the year.

MR. HALLADAY: We have only that one

4-1-7-20

copy, Mr. Dodds. We will have one made for you in due course.

BY MR. HALLADAY:

Q In connection with the thinking you had been doing or studying or research, how ever it would be appropriate to classify it, Dr. Atanasoff, about which you have heretofore been testifying, did there come a time when you arrived at some conclusion of your own as to a process to be followed in attempting to meet these problems that you saw in computing?

A There did.

Q Can you tell the Court, according to your best memory, about when that was?

A I believe this happened in the fall of the year 1937.

Q Do you have any document written at that time which supports that recollection?

A I have not examined my documents with this definitely in mind. I can think of none that exactly supports this contention, this estimate of the time. My memory is very clear upon this subject, however.

Q Do you recall the circumstances surrounding that occasion?

A Well, I wish I could convey to the Court what doesn't appear here which is the matter of how intimately this whole problem, presenting this material in a superficial way as I have, as of necessity, I -- it looks like a cold objective

4-1-8-21

which I was pursuing, but in my own mind at that time, I became inexplicably involved with this subject.

On one cold winter evening I went over to my office and as I, to work, and as I sat in my chair the pressures of this seemed all around me. I don't know whether any members of the Court have ever been on the faculty of a university so that they would recognize the pressures to which such members are subjected relative to the advancement of their graduate students and the publications and the research effort which they must bring forth in order to succeed in that profession. I imagine there is a similar analogy with the practice of law but I do not know what it is.

Everything -- I sat there trying to decide what course of action I should take, and all that I could think of was the necessity for this computing machine, and as I sat in my chair I became more and more nervous and more and more unhappy, and I soon recognized that I had worked myself up into a state in which nothing could happen, and I did something which I sometimes did on similar occasions in that day, I got into my car and started to drive; and I drove very rapidly so that my entire attention would be riveted on the problem of driving, and so I would thus come to overcome my worries. By very rapidly I suppose the speed was 70 miles an hour, and I did this solidly for several hours. At the end of this time I realized that I had passed Cedar Rapids and Iowa City and

4-1-9-22

was approaching the Mississippi River, and I crossed the bridge in the vicinity of Rock Island and turned up a road there and stopped where there were lights, that is, at a little place which was more or less of a bar.

-5-1

Q I didn't hear that.

A That is at a little place which in those days was more or less of a bar. Sometimes they were called honky-tonks in those days. I took off -- I stopped my car there and went in and had a drink, and I realized as I sat there that I had escaped from the tensions with which the evening had begun and that I was able to think clearly; and, of course, the first thought that came to me was, again, a computing machine, and I sat there and worried about the computing machine for a number of hours.

As I rose to leave this place, I realized that I had made progress and that I had come to some conclusions as to how I would proceed in the solution of the problems which faced me. During this interval, I had resolved the problem of what I would use as an Abaci element. I would use a condensor and I would overcome the imperfections of the condensor by having the machinery, the mechanism of the machine jog its own memory at frequent intervals.

At that instant, I had not resolved the further question as to how Abaci of this kind would inner act to produce the elements of arithmetic and algebra, that is, to produce addition and subtraction, but I had strong assurances within me that such means were at hand. I drove home more slowly and went to bed.

Q Have you done thinking before now about that event or those events of that evening?

A Yes, I had recalled them.

Q Have you been able, for example, to recall what kind of a car it was you were driving?

A I was driving a Ford car, a Ford V-8 car.

Q Do you have a recollection now of whether it was a two-door or a four-door?

A Only indirectly. It was my habit in those days to buy two-door cars and I am practically certain it was a two-door, but that is not direct memory. That is just the knowledge that that was my practice.

Q Doyou have a recollection of whether you drank to the point of intoxication that evening?

A Oh, I had a couple of drinks, and I seemed to have drunk enough so that the bar maidwasn't unduly attentive, but I didn't feel the effects of the alcohol.

Q Do you recall now what kind of clothing you were wearing with any degree of specificity?

A Well, it was a darn cold evening and I had on an overcoat, that I remember.

Q Do you remember what kind of an overcoat?

A I do not.

Q Have you sought to recall everything that you could about the events of that evening?

3

A Yes, I have sought in a general way to recall every event of the evening.

Q Did you make notes in the course of that evening about what thinking you were doing at that time?

A I really do not know whether I did or not, to be truthful. It didn't matter much because these kind of matters, when once resolved, were firm in my memory and I had no difficulty recalling them, nor would anyone else in similar circumstances, it seems to me.

Q After that occasion, then, what did you do pertaining to this matter which, as you have said, was pressuring you?

A The first thing I did, I called it an evening and went to bed, and then I commenced to pursue the necessary perfection of this idea to enable it to come to fruition.

Q Would you be good enough to get your file open and up on top of the table?

A I wonder if we can just stack the pages, the folder up here?

Q Do you have your original files before you now, Dr. Atanasoff?

A I do.

Q Is that without exception? Are all of the files you brought with you now present, accounted for and on top of the table?

A I believe there is a small number of these files which I have fefore me which are not present, which are in other places being duplicated at the present moment.

Q Would you be good enough to refer to the file folder that has been marked as Atanasoff Deposition Exhibit D-1?

A D-1 is before me, sir.

Q And would you observe document No. 0237 therein?

A Document 0237 is at hand.

Q Referring to Atanasoff Deposition Exhibit A-1, document 0237, do you have before you the carbon copy of that document?

A I do.

Q Has that carbon copy existed in its present condition since the date it was prepared?

A It has so existed.

Q Was it prepared by you?

A It was.

Q What was done with the original of which document No. 0237 is a copy?

A It was directed to the Iowa State College Research Council, an organization for the pursuance of research at the Iowa State College.

Q Does the copy of document 0237 which you have before you bear the original of a signature on the second

page?

A It does.

Q Whose signature is that?

A Dr. J. W. Woodrow.

Q Were you acquainted with Dr. Woodrow at that time?

A I was.

Q What was his then capacity?

A He was then head of the physics department of Iowa State College.

Q Is he still alive?

A He is now deceased.

Q Is that his original signature?

A I am positive. I remember it well.

Q And has that document been in your personal possession ever since it was written?

A It has.

Q Was it written on or about the date it bears, March 24, 1939?

A I have no other knowledge of the date. I am sure the date is correct.

Q Was that document now numbered 0237 prepared in connection with your activities as an employee of Iowa State?

MR. DODDS: Objected as leading.

BY MR. HALLADAY:

Q Tell us whether or not document No. 0237 was prepared as a part of your activities as an employee of Iowa State?

A Yes, it was so prepared.

Q As of that date, Dr. Atanasoff, referring back now to the incident that you have just previously described to us of driving to this honky-tonk and the period thereafter, in other words, I am defining a date now between a date in 1937 and March of 1939, can you describe for the Court the character of the work which you did, if any, pertaining to the subject matter which you had considered that night at the honky-tonk?

A I have.

Q Will you describe it?

A Well, the conception which took place on that evening of date unknown, which is believed to be in the fall of 1937, but it might possibly have been in the winter of 1938, and the date before us on document 0237, I had occupied myself as fully as possible with the computing machine. I felt excited about this device and my spare moments were always devoted to it.

In order to account for what happened in more detail, I can say that you must remember that I had, during this period I had a full schedule of graduate

teaching, post-graduate teaching -- I am sorry, not graduate, correction, post-graduate teaching, a full schedule of post-graduate teaching, and I had on my hands a number of graduate students. The exact number does not occur to me, but it could be ascertained from the records, it probably was three or four, and besides this, I had other duties to perform at the University, such as those relating to appearing on committees, principally in my case graduate study committees for various students, not only my own but those of others, and so my activity in this field was limited.

Nevertheless, I proceeded as vigorously as possible, and during this period, I devised logic circuits for performing the addition and subtraction which was required to complement the conception which I had had on that date.

I commenced to contemplate how a conversation from base 2 -- from base 10 to base 2 would occur so that this process could be mechanized, and I commenced to lay out the general arrangement of a computing machine.

Not until these processes were well in hand, could I go to the Iowa State College Research Council and ask for funding for a project to pursue this purpose. Roughly speaking, these funding operations

always took place in the spring.

Q We will get there in a moment.

A All right, period.

Q Coming back to the interval of time between late 1937 or early 1938, whatever the case may be, and March 24, 1939, when you wrote the letter, document 0237, and incidentally, I note that the second page of that document is also numbered 0238, is that correct?

A That is correct.

Q So we have a single document of two pages but separately numbered in this case, correct?

A That is correct.

Q In that interval of time, can you say what you did to develop, if that's the proper term, what you have called logic circuits?

A Yes.

Q Would you do so?

A May I use the written material?

Q I beg your pardon?

A May I use the blackboard or pad?

Q I would prefer, to the maximum extent that we can to expedite the matter, by having you say in words and then if it appears appropriate, that those words be amplified or illustrated, then we will go to the use of the board. I recognize this may make it more difficult for you,

but I would appreciate it to the maximum extent that you talk to us.

A You know, we had made up our mind that the machinery proceed by base 2 principles. At this moment, we thought the base 2 principle relating to computing machines was original with us.

Q Dr. Atanasoff, you are saying "we had." Were you working on the project during this interval of time with another person?

A I was not. This was an editorial "we".

Q All right. I am sorry to interrupt you, but we have a record problem.

A It is common mode of speech, and I meant almost precisely me by myself, not that on occasions that I may not have discussed part of it with one or more of my graduate students, in spite of the fact that I had no regular person employed upon this project, but it just meant the lot of us, me principally, but maybe somebody else occasionally adding a word or at least serving as a recipient of concepts from me so that my conception would be strengthened by imparting it to others.

Q I am sorry I interrupted and I undoubtedly broke --

A This is the best I could do.

Q Well, I am sure that I broke --

A I will try to use the word I in the future.

Q All right.

A Because this was essentially my own work.

Q Now, I may have broken the train of thought that you were attempting to follow.

A Well, now, let's see. Yes, you have.

Q The question related to the development, if that's the proper word, of the, what you called logic circuits.

A All right, I'm on the beam.

Q And my question is to describe that development, if that's the proper word.

A Well, of course, it was to mechanize base 2 calculation, so I proceeded to make myself a table of base 2 sums and differences and to attempt to mechanize the entities, and it's a tough enough job, particularly when you do it without any of the modern approaches to this subject which involve a complicated logic analysis. We had no such thing in that day, but I just busted in the middle of it and eventually came through.

This occupied several months. I remember that pretty soon I saw that there were in many places alternatives of structure which could be employed. I had to make some decisions between these alternatives of structure. These decisions were made along bases that in modern language would be called to minimize, fan out,

using modern parlance in describing what happened. I had to, I had to -- I knew the vagaries of electronics. I knew it was hard to maintain them in a strictly controlled state, and, of course, in that day it was harder than it is in this day because one did not have in hand many of the methods which are available in modern technology for regulating the voltages and stabilizing the operations of the devices, of the electronic tubes, to be specific, but also the other elements of the circuit. Resistors weren't as stable, and other things, so I felt this circuit should be devised along methods which would make it operate over the greatest range of the parameters which entered into that circuit.

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I will verbalize a little further in this direction. you know, I found it hard to convince myself at first that one could ever come out with this kind of operation. Can a vacuum tube really compute? These doubts assailed me, and then I would console myself with the following remark: Now, suppose one sets out to build a computing machine by mechanical methods. You know how that machine works. It works as long as you get your shafts adjusted about the right distance apart and as long as the gears don't get worn too much, and whatever other dimensional parameters you want to apply to the system, it works as long as those parameters are within limits, and if they fall out of limits, then the machine stops working and makes terrible mistakes, but up to that point it gives you a perfect numerical calculation; and then I saw that in spite of my fears about computing circuits involving vacuum tubes, that, as a matter of fact, the problem was exactly the same there, and thus consoled by this logic, I surged forward and eventually came out with devices which I felt would work. I did not do the experimental work at that time.

Q And again, when you are speaking of that time, are you confining yourself to the period between the night drive, if I may call it that, and March 24, 1939, when you wrote the letter, Document 0827 -- excuse me -- 0237, 0238?

A Yes.

Q As of the date of that letter, Dr. Atanasoff, have

5-2-2-24

you written out any diagrams, schedules or made any writings reflecting the thinking and/or the work that you have been doing in that time interval?

A I am not sure. As I sit here, I am not sure.

Q Have you searched to discover any?

A I have certainly written them out, but whether I -- Now, was your question, "Have you written them out?"

Q Had you written them out during that time?

A I had, yes.

Q Have you searched to find if the same still exists?

A I do not know. I have searched and I have found, and whether there is one of them in this interval or not, I have not ascertained.

Q That would depend upon the specific reference to the file, which we have not yet done?

A If I have it, it is before me.

Q All right. Now, with reference to this exhibit A-1, Document 0237 -- excuse me -- Document D -- Exhibit D-1, Document 0237, 0238 --

THE REPORTER: You said before A-1 --

MR.HALLADAY: I know I said A-1 and then I tried to correct it.

THE REPORTER: About ten minutes ago you said A-1.

MR. HALLADAY: I did? Thank you very

5-2-3-25

very much.

BY MR. HALLADAY:

Q Dr. Atanasoff, the reporter has directed my attention to the fact that earlier I had referred to Atanasoff Deposition Exhibit A-1 as containing documents 0237, 0238. Now, at all times have you had Exhibit D-1 before you containing documents 0237, 0238?

A I have.

Q Will you kindly forgive me for having made this error, and have we all along been talking about the same document in my questions?

A We have.

Q All right. If that's the worst I do, I will be very surprised.

After writing this document of March 24, 1939, 0237, 0238, was there a grant?

A Yes, I believe there was a grant.

Q And following that letter, what if anything did you do to further your work in connection with a computing machine?

A I proceeded to --

MR. DODDS: I would just like to have stated on the record that Dr. Atanasoff is apparently referring to some notes which are not a part of the exhibits D-1, the exhibits to which we have been referring. If he refers to those notes, in due course

5-2-4-26

we would like to have an opportunity to see them.

MR. HALLADAY: Of course.

THE WITNESS: In direct answer to your question, I continued to work on the computing machine project. One question that was not really resolved at that moment was data in and data out apparatus. It seemed appropriate to me that data would go in on base ten cards but I knew that data in and data out apparatus based upon the base two number system would be necessary in order to bring the machine to any range of success.

BY MR. HALLADAY:

Q Then after your letter of March 24, 1939, did there come a time when you arranged for assistance in connection with this project?

A I then commenced to seek assistance, asking people who would be an appropriate assistant to work on this computing machine, and in some way I found Mr. Clifford Berry who was then a senior student in electrical engineering.

Q And when, if you can tell us, approximately, was an arrangement made, if it was, to have Mr. Berry assist you in any way?

A Before the end of the school year, Mr. Berry and I had come to an agreement and he had agreed to work on this project, but as to a further more exact date, I cannot state.

Q And do you have a recollection now when, in fact,

-2-5-27

Mr. Berry commenced any work on this project?

A I do.

Q State your recollection as to that?

A What had happened was that, of course, these projects were, the kind of appointment which Mr. Berry received, were for the academic year and did not cover the summer and my funds and means were so limited that I could not employ Mr. Berry for the summer, and during the summer of 1939, he worked for some local company in Frederick -- I am sorry, in Ames.

Q Then when, actually, did Mr. Berry commence to work?

A And he commenced working in the fall at the beginning of the academic year, say the tenth of September or some such date.

Q Do you recall now the capacity that was assigned to him, technically speaking, for this work?

A Well, Mr. Berry was to act as my assistant in this particular project, and meanwhile, this was to occupy his attention for perhaps two-thirds of a working day, and during this period he could take two-thirds of a normal working day in graduate work, so you see, this was extending Mr. Berry's capacity.

Q Was he compensated for his work?

A He was compensated.

Q And do you know the source of his compensation?

5-2-6-28

A Yes, the source of the compensation was this grant of aid which I sought in the letter 0237.

Q And do you recall the amount of the compensation?

A I recall a figure which I hope is correct, and it was $450 for nine months.

Q Payable monthly or how?

A Payable monthly, yes.

3-6

Q Following the time that Mr. Berry actually began work on this project, can you describe in words what you and he did?

A Yes.

Q Will you do so?

A Well, even before he came in employment, I commenced to discuss with him the elements of the system which we wished to produce, and immediately after his employment this process continued at a very rapid rate. This year and a little more, between the date of my conception of these plans and the date of a grant and the date of his coming to work had resulted in a very clear conception in my mind, at least, and probably on paper, of the day, as to how I would proceed in the machine and we went to work at a, what looks to me at present, as an amazing rate.

Q Well, tell us what you did?

A Well, we said the first thing to do is to, we really --

Q Dr. Atanasoff, to the maximum extent that is possible, please tell us what you did rather than what you and Mr. Berry may have said to each other? I recognize this is difficult. I would like to have some kind of description of the doing rather than the saying.

A Well, we thought -- is it all right to think?

Q No, because I don't think you can say what Mr. Berry thought. I would like to know what you did.

A It makes -- I guess I can do it.

Q All right.

A I will try. We proceeded -- we proceeded to construct a prototype computing element of this kind embodying the Abacus elements which we decided upon, to wit, a condensor in two states of charge to designate the zero and the one of the base two number system to construct, build and test logic circuits according to the conception that I have previously worked out and to construct the other elements necessary for the coaction of these devices into a successful computing machine.

Q What sorts of devices were employed in the construction of the prototype?

A Well, we employed condensors.

Q Yes?

A And the condensors were typical of the day, they were wax impregnated foil wrapped condensors and tests on them were made, at this time a great many were made, a great many tests were made to insure that the time of discharge of the condensors would be sufficiently long so that the memory would be retained, having in mind that the memory would be jogged at different intervals, we were slowly formulating a -- we were slowly formulating

a structure, and according to this structure it was contemplated that the memory of this device would be jogged roughly every second, not precisely, but roughly every second and we found that it wasn't too hard to --

Q Dr. Atanasoff, you are not being responsive. All I asked for now, and I recognize this is difficult, but I am limited --

A All right. Condensors, vacuum tubes, wire, power source, and let's see, I've got to have something else, a motor.

Q And you have used the term prototype, I think?

A Unfortunately I presume?

Q I don't know that it's fortunate or unfortunate. Did they come a time when there was a prototype constructed?

A There did.

Q And can you give us without referring to documents approximately when that was?

A It occurred late in the fall of 1939. I don't know whether it was the last of November or during December but it was roughly in that period.

Q While the work was going forward that led to the construction of that prototype, was any work going forward at the same time looking beyond the prototype if you can recall?

A Well, before January 1 there was several weeks of

work go ng forward looking to something beyond the prototype. The problem -- well --

Q Who besides yourself and Mr. Berry were involved in this project during the fall of 1939?

A I presume there was no one else involved directly.

Q Were there others engaged in making any mechanical pieces or parts for either the prototype or anything else connected with the project?

MR. DODDS: Object to the leading question.

BY MR. HALLADAY:

Q You may answer.

A I am not perfectly sure about this. It would have been natural at this instance, in Iowa State College you've always got your machine work and you either did it yourself or got somebody to do it and it would have been natural at this time to employ the Iowa State College instrument shop to do mechanical work for us. Probably they did some of the mechanical work but exactly and for sure my memory is not perfect on this point.

Q Do you recall who at that time was in charge of the instrument shop?

A Mr. I. A. Coleman.

Q Where was the instrument shop located in those days?

A It was located in the physics building.

Q Is that the same building where you had your office?

A It is. It was the same buildirg where I had the office and same building where I had quarters for the computing machine and within a hundred feet or so of each other.

Q And do you recall what kind of equipment was in the Iowa State College instrument shop in those days?

A Well, I presume --

Q Dr. Atanasoff, please don't presume.

A I won't.

Q Will you give us a general idea of what kind of equipment there was there at the time?

A Well, my memory is just not sufficient to enumerate the equipment, however, I remember that there were later, and milling machines, that there was in that instance a filing machine there, there were saws for working wood, there were, well, general, the usual appurtenances of a shop. In good -- in good measure but not unduly refined or not unduly perfect mechanically, mechanical equipment.

Q Dr. Atanasoff, have you attempted to collect and have here in the files which you have brought and which have heretofore been marked, documents bearing on purchase

of parts or the manufacture of parts or pieces pertaining to either the prototype or any subsequent machines in the course of this project?

A I have so collected.

Q Did you have the documents which you have collected and brought here in your files pertaining to such activities, namely, purchase of parts and things of that sort in your personal custody and possession?

A At that time?

Q Yes.

A Please restate that question. I would like to hear it in its entirety.

Q All right. At the time of the work that led, first let us say to the prototype as it has been called, was there some process following pursuant to procedure of some kind to make a purchase order, just pick an illustration?

A There was. There was.

Q Did you initiate documents pertaining to that or how was that handled?

A That was -- they were initiated by me and by Mr. Clifford Berry as occasion arose.

Q Did you at that time have occasion to superintend that activity?

A I did.

Q Did this continue throughout the project relating to your activity in the computing machine field at Iowa State?

A It did.

MR. DODDS: Objected to as leading.

BY MR. HALLADAY:

Q Did you at that time maintain files pertaining to such activities?

A I did.

MR. DODDS: Objected to as leading. Mr. Halladay, I don't think it should be necessary to have to object to every single question, but I don't see any alternative if you persist in examining the witness with leading questions.

BY MR. HALLADAY:

Q Have you brought with you the files pertaining to requisitons, purchases, and receipt of materials and equipment concerning this project that were maintained during the time of the project?

MR. DODDS: Objection. Same reason.

THE WITNESS: I have.

BY MR. HALLADAY:

Q Are they in the condition now, age excepted, that they were when they were uttered or issued, as the case may be?

MR. DODDS: Same objection.

THE WITNESS: I believe so.

BY MR. HALLADAY:

Q And have you personally seen to it that these have been preserved ever since the day of their original utterance or issuance?

MR. DODDS: Same objection.

the WITNESS: I have.

MR. DODDS: I shall move that if this deposition is offered in evidence, I shall move to strike the portions which comprise answers to leading questions.

BY MR. HALLADAY:

Q Following the completion of the prototype, what, if anything further, did you do in the field of a computing machine?

A We first tested the prototype.

Q And then what?

A Then we proceeded vigorously to utilize these ideas in a larger machine.

MR. DODDS: I don't know whether the notes that are passing have anything to do with this examination but if they do why I would like to see the notes.

MR. FALLON: I don't know whether

under these circumstances you are entitled to the advice given by personal counsel to the witness here, Mr. Dodds. I can tell you exactly what transpired in this instance because in all instances if it's anything other than an innocent question on procedure, I will ask for specific time in which to counsel with my client, but Dr. Atanasoff was concerned about the situation which had just gone on and was there anything that he could do about it, and my answer was no.

MR. DODDS: Thank you.

THE WITNESS: May I show him the notes?

MR. DODDS: That won't be necessary.

MR. FALLON: I prefer not to. I don't want to establish that precedent and this is not construed as a waiver of the personal right the witness has to independent counsel and as you stated previously, I have no standing here other than that.

Mr. HALLADAY: Excuse us. We are a little confused by the filing system we are confronted with here. Maybe we might just go off the record for a minute.

(Discussion off the record.)

MR. HALLADAY: Gentlemen, because of the filing system which we have all seen and our

copying and manipulating of documents today, I have come to the point where I want a document, and I am unable immediately nor is Mr. Allegretti, trying to help me, to turn up the documents that I want, and rather than involve the witness in hunting for the document while we are all here, I would rather try to get our copies organized, and I hope we can proceed more expeditiously by that than while doing it while we are all here. So I suggest, unless somebody has some better ideas, rather than quitting altogether that we just suspend until tomorrow at 9:00 and try to get our own organizatin in better shape so we can go forward then.

(Discussion off the record.)

(Whereupon an adjournment was taken until 9:15 o'clock A.M., November 13, 1968.)

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VOLUME III

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

Honeywell, Inc., Plaintiff, -vs- Sperry Rand Corporation and Illinois Scientific Developments, Inc., Defendants.	:	4-67 Civ. 138

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 9:20 o'clock a.m., November 13, 1968.

(Appearances as heretofore noted.)

12-30

Whereupon,

JOHN V. ATANASOFF,

having been previously sworn, resumed the stand and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

THE WITNESS: May it appear that Mr. Fallon isn't here this morning.

MR. HALLADAY: Is it all right to proceed without him?

THE WITNESS: Yes. I will not object to that.

MR. HALLADAY: On the record, I am handing to the reporter Atanasoff Deposition Exhibit P, and I am delivering a copy of same to you, Mr. Dodds.

MR. DODDS: Thank you.

BY MR. HALLADAY:

Q Dr. Atanasoff, would you be good enough to take your files that you have brought with you from their suitcase container and put them again before you on the table, please? May I help you?

Heretofore we have had the various folders marked by the reporter, some of them with the total legend Atanasoff Deposition with the alphabetic, alphabetic or numerical identification, some of which the reporter has shorthanded by merely marking it H-1, for example, with his initials and the date.

1-3-31

And I would like it, if you would, have them in such fashion before you that they follow the order of our outline that is in A-1, I believe, which, in effect, tells us how the file is organized.

A I would rather not use the outline in A-1. I would rather use the outline which is before you and which I have given you a copy of and which I have at my hotel but do not have here, if you can supply me with such a copy, because that is the true state. I enclosed the other outline because it has certain importance and it's approximately correct, but we will be in better shape if we have them in the order of the later outline which I have given you and not incorporated in the files and the gentlemen of the defendants have a copy of it.

Q I didn't have immediately at hand a reference to the exhibit marking that we put onto the outline of which we have been furnished a copy. In any event, what I am saying to you now --

MR. HALLADAY: Could I borrow yours for a moment, Mr. Dodds?

MR. DODDS: Off the record.

(Discussion off the record)

MR. HALLADAY: All right. I think we are ready to go on the record. In the meanwhile, I have found what I was attempting to refer to before and that

1-4-32

is an outline, if I may call it that, of the file that has been marked as Atanasoff Deposition Exhibit J for reference, and I believe you, Mr. Dodds, have a copy of that?

MR. DODDS: Right.

BY MR. HALLADAY:

Q Then what I was asking you to do, Dr. Atanasoff, as nearly as conveniently you could, to have your file before you in the order that it appears on Exhibit J.

A It is now in that form.

Q Very good.

MR. HALLADAY: Mr. Dodds, in the interest of saving time, as you know, we have given you copies of Dr. Atanasoff's file, save certain ones which are still in the process of being commercially duplicated and I would like to use the exhibit identification and the numbers that each of the original documents bears for reference, with the understanding that as I have suggested earlier, the duplicates which are marked identically with the originals need not be marked by the reporter while we are all present but can be marked during a recess or at some other time so as to get the reporter's identification on the duplicates that will be included with the transcript of the deposition for ultimate availability to the Court in determination as

-5-33

to whether some one or all of any documents that may be offered in evidence will be received, will not be received or some other ruling made with respect thereto.

MR. DODDS: That is agreeable.

MR. HALLADAY: All right.

BY MR. HALLADAY:

Q Dr. Atanasoff, then, will you refer to your file A-1 --

MR. HALLADAY: And may it be understood between all of us that to avoid unnecessary repetition in the record, I need not say Atanasoff Deposition Exhibit A-1, but merely say File A-1, and since the numerals are four digits starting with quadruple zero and triple zero one on through whatever the latest group of four digits may be, that I need not repeat the excess digit identification, but may speak of the documents as one or 83 or 14, 41, as the case may be?

MR. DODDS: That is acceptable.

MR. HALLADAY: All right.

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EA#2
?/1/34

BY MR. HALLADAY:

Q Dr. Atanasoff, you understand this discussion we have been having?

A I do perfectly. I do perfectly.

Q Very well, then referring to A-1, can you state when No. 1 was prepared?

A I cannot exactly.

Q Can you give us an approximation?

A It was prepared many years ago, and I expect in '42, but I am not quite sure.

Q Is it in your hand?

A It is in my hand.

Q And as to --

A I am sorry it's not dated.

Q In any event, it was prior to any knowledge on your part of the current litigation?

A Very much prior to it.

Q Then with reference to Document zero, is there a document zero?

A There is.

Q In A-1?

A There is.

Q When was that prepared?

A That was at -- beginning of this litigation, that

was the first, the first outline of my files that I prepared after they had been selected from my general files and classified in order.

Q By whom was that prepared?

A It was prepared by myself, assisted by my wife.

Q Who did the typing?

A I am not sure, either one of us, perhaps.

Q Then there is a handwritten note at the top of it, in whose hand is the note?

A That seems to be in her handwriting.

Q The date?

A In her handwriting.

Q And what is the date?

A The date is the first of September, 1967.

Q And, incidentally, I have observed in other documents and also in marking on the board that you from time to time deviate from what might be regarded by some as standard practice in dating documents by changing the order of appearance of the month, the year and the date. Is this something you have used for many years, used more recently, used invariably or used from time to time?

A I, for some years, I have been using this invariably where the choice is mine. Sometimes I have to use the other when I am filling out the form which has the year already at the right-hand side. I am doing this because there are just so

2-3-8

many logical principles which permeate our whole civilization that every one I get a chance to order I am going to attempt to order.

Q Then if you had your way on marking dates on documents, in what order would the marking be done?

A There would be first the largest unit appearing at the left, and the largest digit of that unit also appears on the left, namely, the one standing for 1,000 years is to the left of the nine standing for 900 years, and the year stands at the left and next comes the month and next comes the day and if I put down the hour it follows.

Q However, during a part of your lifetime, when you were associated with the military, did you sometimes use the military method of dating documents?

A Yes. By force.

Q And that method of doing it was what?

A I am not sure. I paid little attention to it.

Q All right.

A I do remember the military method of designating hours which I still continue because I think this is advantageous.

Q You mean by that what?

A Like 1230 for 30 minutes past 12 and 2300 hours for 11:00 o'clock in the evening.

Q Then with respect to file A-2, would you turn to that

2-4-9

please. Document 2, is that in that file?

A It is.

Q What is that?

A That is a Christmas letter published by Dr. J. W. Woodrow to inculcate a small amount of Christmas spirit among the people in the physics department at the Iowa State College in our university and among those who have gone away.

Q Can you identify the date of the Christmas involved in No. 2?

A In No. 2 the Christmas is '39.

Q Specifically with reference to document No. 2, there is some matter in it which has had some relevance to your efforts to recall the past?

A I notice on page 14 that there is a reference to me and it mentions the computing machine. I am not sure how much --

Q I am not asking you to read it. I am simply asking if there is a reference in No. 2 that has been employed by you in your efforts to regain as much memory success?

A Yes.

Q Now, specifically with reference to No. 2, can you tell us the extent to which that document was circulated or in the vicinity of Christmas 1939?

A It was circulated among members of the physics department and people who had gone away.

: -5-10

Q And with respect to the item which mentions you on page 13, did you say?

A Fourteen.

Q Fourteen. Of whose authorship was that?

A Oh, I suppose that somebody was writing this up came about and spoke to me about it. I am pretty sure I didn't write it.

Q Was the information that is reported on page 14 of document 2 obtained from you or from some other source?

A I can't be a hundred percent sure, but it might have been obtained from me.

Q Can you say whether or not the information as reflected in No. 2 was at the time accurate?

A It is. It is certainly accurate or generally accurate.

Q Turn your attention to No. 3, please, what is that?

A Another Christmas letter.

Q Dated as of what Christmas?

A I believe it is '41. Yes, it must be '41. I estimated the date as '41.

Q Is there any way from examination of it that you can be more specific about the date?

A Well, we see, for instance, student under Allen, Phillip W., graduate student, 1940-41 now at East 60th Street in Chicago. So it must have been at least the Christmas of

2-6-11

'41, this being put out at Christmastime every year. I don't know. It seems that way. I looked it through and it seems to be that.

Q Is there a reference in No. 3 to you in any way?

A There is.

Q On page what, please?

A Page 24.

Q Now, was this Christmas letter No. 3 of the same kind of circulation as No. 2?

A It was of the same kind of circulation.

Q And with respect to the information on page 24 pertaining to you, was that information obtained from you?

A It looks as if that I wrote it because it seems to be in the first person.

Q Is that information accurate as of the time of the circulation of No. 3?

A I will read it again and check it for accuracy.

Q If you will, please?

A That information seems correct.

Q I notice that on the cover sheet or first page of document No. 3 there is a penciled or pen notation, you observe that up near the picture?

A I do.

Q Of the Christmas scene?

A Yes.

2-7-12

Q Whose writing is that on the original?

A That is my hand.

Q Will you turn then to document -- excuse me, file A-3. Turn to file A-3, document No. 4.

A File --

Q Document No. 4 which consists of four pages numbered four, five, six and six-B?

A Right.

Q Do you have them before you?

A I have it now, yes.

Q What are those sheets?

A They were sheets to use for a radio broadcast involving this subject of current discussion.

Q Were those sheets used by you in making the radio broadcast?

A They were so used.

Q According to the date on document No. 4, can you tell us whether or not the broadcast was or was not on that date?

A I cannot firmly. I believe it was, but I cannot firmly so state.

Q Was the substance of the script, if I may call it that, reflected by documents 4, 5, 6 and 6-B?

A It was.

Q Was the broadcast over a radio station somewhere?

2-8-13

A It was so broadcast.

Q What radio station?

A WOI in Ames, Iowa.

Q Were you a participant?

A I was a participant.

Q Who else was a participant?

A I believe Mr. Berry was a participant, that's my memory. Is that portrayed here? Yes.

Q There is another name that appears in the script on page four and on succeeding pages, do you recall that person?

A I would say that McNay was a woman who was interlocutor on this occasion.

Q Do you know anything now more about her than what you have just said?

A I do not.

Q Is this, so far as you can recall, an accurate transcript to the extent that it goes of what was broadcast on or about May 1, 1942, over WOI?

A It is essentially the substance of the broadcast, I believe, that there were a few extemporaneous questions appended, but they do not appear here.

Q To your knowledge was any recording made of that broadcast?

A I have no knowledge.

Q Turn, if you will, to document No. 7. That appears

2-9-14

to be a reproduced copy of a document?

A It is.

Q Does your original file include some kind of a reproduction of a document marked No. 7?

A It includes a copy which was taken from a newspaper as this one was.

Q Well, what I am trying to find out --

A It does not include the clipping.

Q That's what I'm trying to find out. Is document No. 7 a clipping from a newspaper?

A Not as far as I have it in my possession.

Q Was that document, however, a reproduction of something that was in fact published in a newspaper?

A It was so produced.

Q Did you see the article in the newspaper which No. 7 is a reproduction at the time of its publication?

A I did.

Q And do you recall independently of the document the date of the publication?

A No. I do not.

Q Was the date of publication on or about the date which the document itself bears?

A I believe so.

Q And there is a newspaper name there, is there?

A I beg your pardon?

-10-15

Q There is a newspaper named on the document No. 7?

A There is such a newspaper you mean?

Q Is there --

A It is named there.

Q Is there a newspaper named on the document?

A Yes. It says Des Moines Tribune.

Q Was that news article and photograph as reproduced on document No. 7 in fact, to your knowledge, published in that newspaper?

A I believe it was. Yes.

Q Did you see it?

A I saw it.

Q Is this a faithful reproduction --

A But if somebody published it in a different newspaper and then had changed the name here I would have no way of knowing that.

Q All right. Do you recall now where you got this document from, No. 7?

A I will have to make reference in order to determine that fact.

Q You don't recall of your own knowledge?

A I do not.

Q Where it came from?

A I do not at the moment.

Q The next document in file A-3 is No. 8 and does

2-11-16

that appear in your original file to be some kind of a machine reproduction?

A It does.

Q Do you know what kind of a machine reproduction it is in your original file?

A I do not.

Q Do you know who made the machine reproduction?

A I do not, but it comes through my files for years.

Q You have had it for some period of time?

A For years.

Q Do you know where the original of this particular document that is now numbered 8 is?

A I do not.

Q Do you know when the original of what is now numbered 8 was made up?

A Yes. I remember the instance of its being made up.

Q State that?

A It was information which was produced by the Iowa State College Information Service as information on everything that was happening around Iowa State College was made up for release to newspapers and for use as these newspapers desired. It was information released for the local presses of the state or otherwise.

W-3-1

Q Now, does document No. 8 have a date on it?

A It has a date April 7.

Q Does it have another year date on it? You should really answer these questions just yes without saying what the document says, Dr. Atanasoff. Does it have a year date on it, No. --

A No.

Q Well, if you look at the foot, maybe yours is --

A It says 1942.

Q Well, Dr. Atanasoff, please, now, we have got some technical problems. I am trying to avoid any difficulty with Mr. Dodds' possible objections here. If I ask you if a document has a year date on it, the answer should be either yes or no.

A Now, I can --

Q Do you understand?

A I can reply to counsel, but I would rather do it off the record.

Q All I am trying to do is to eliminate the possibility of objections from Mr. Dodds by my instructions.

A I prefer that counsel be very slow in his requests and careful and that he avoid confusing the witness. There is a real reason why I missed that date at that moment.

Q Well, all right. I am sorry. Now, do I have an understanding with you as to what I was just trying to say?

A I read you loud and clear, if that is what you mean.

Q All right. Do you know whether or not the information now set forth on Document No. 8 was in fact released publicly by some press relations type of activity of Iowa State on or about the date that now appears on Document No. 8?

A It appears to me that the reason that this is the reproduction is that the reproductions were those made at the time of the release and that at the time of reproduction of this item, it was so released, that I believe is the fact.

Q Will you also turn your attention to the next document in Exhibit A-3, Nos. 235 and 236. Can you identify them?

A This seems to be the same article in typewritten form.

Q Can you tell us whether you had any hand in the preparation of Nos. 235 and 236?

A I did.

Q What hand did you have?

A I don't really know. My memory doesn't suffice for this. I am sure I had a hand. Whether it was principally written by me or by Mr. Berry at that time, I do not know.

Q Do you know of your own recollection now who typed

these documents that are now numbered 235 and 236?

A I have no knowledge and I preferred that may have been an original typing but it does not appear so because this is a first copy and not a carbon copy, I believe, and I believe that if we had typed it, the first copy would have gone to the information service, and this confused me and I was unwilling to call it the original of the article.

Q Does Document No. 235-236 have a month date and year date on it?

A It has a year date, 1942.

Q Excuse me, Dr. Atanasoff. If you will please not state the date, but merely say whether it does or does not.

A It does.

Q Does it have a month date on it, also?

A It does.

Q Do you have a recollection of whether or not that document now numbered 235 and 236 came into your possession on or about the month, day and year that the document bears?

A Well, it is a part of my longtime files. The exact moment when this document came into my possession is not known by me.

Q Have you had possession of it for how long, do you think?

A These files hadn't been opened by many, many years, and I believe that this document dates back to the date,

to approximately the date thereon.

Q Thank you. Would you now turn to Exhibit B, please? That's the next folder, B and B-1.

MR. DODDS: Off the record.

(Discussion off the record.)

THE WITNESS: Did you say B or D?

BY MR. HALLADAY:

Q B for Berry.

A All right.

Q Maybe that is an unfortunate reference. I will use bravo. Maybe that is the one that will be a little better. Do you have Exhibit B-1 before you now?

A I do.

Q Document No. 9?

A I do.

Q What is that?

A That is a letter written by me to Mr. Clifford G. Anderson.

Q Is that a carbon copy of the original?

A It is.

Q Was the original mailed by you or caused to be mailed by you?

A It was.

Q Is this a retained copy of the original?

A It was.

Q Has it been in your possession ever since its date?

A It has.

Q Exhibit No. 10, what is that?

A That's a letter written by Dean R. E. Buchanan to Dr. Jay W. Woodrow, concerning the status --

Q Excuse me. Again, purely for technical reasons, and I am sorry if this bothers you, but I would rather you didn't attempt to state the contents of any of these documents, merely what they are.

A You asked me what it was and I was about to tell you what it was, and if you have another definition of what it was, then I will be glad to attempt to use it. I am trying awfully hard.

Q All right, sir.

A And I can't try much harder.

Q It is a letter?

A It was.

Q Which was--

A I am sorry.

Q I amattempting to do the counselling that I think is needed of me in an effort to move this along as rapidly as we can. It is a letter written on or about the date which it bears, either by the witness or to the witness, and it is either a retained carbon copy or it is an

original, if it were received by the witness, and copies were sent, if copies are indicated, to the persons whose names appear on the document.

Now, this would be the pure way of identifying a document, and our problem, Dr. Atanasoff, is this: Until we are before the Court, we do not know whether the Court will be willing to consider the contents of the document, and therefore, it is inappropriate for me as a lawyer to get the subject matter of the contents of the document into the record indirectly by having the witness say what the document says.

Do you see what the technical problem is?

A I do.

W-3-2

Q Very well. That's why I have been interrupting, and I am sorry that it's been this way, and I hope you will forgive me.

A I will.

Q Now, let's just try it as an experiment on this one all over again. Directing your attention to Document No. 10, what is it?

A It is a copy received by me in accordance with the usual practice of the University, of a letter written by R. E. Buchanan to Dr. Jay W. Woodrow, date of October 31, 1941.

Q Has it been in your possession ever since you received it?

A Yes.

Q Document No. 11, what is it?

A It is a copy of a letter written by Dean R. E. Buchanan to Mr. Clifford G. Anderson, a copy being received by me in course, and the date is November 19, 1941.

Q Has it been in your possession ever since?

A Yes.

Q Document No. 12?

A This is a letter written by R. E. Buchanan to me. The date is February 3, 1942.

Q Is this the original of his signature, or is it --

A I am sure it is.

Q Then at the foot in the lower left-hand corner just above the numerical identication 12, there is some handwriting -- excuse me, lower right-hand corner. Can you recognize whose hand that is?

A No. I hawe an idea.

Q Are you able to read what is written there? Don't tell me what; just whether you can read it or not.

A No, I cannot.

Q Do you know, without regard to the person, the identity of the one who put that notation on this document,

Exhibit 12?

A I suspect it was a young lady who was then my secretary.

Q Do you now recall her name?

A Without reference to dates, which would take more time, I believe this was Jean Reed, who is now named Jean Berry.

Q And the date of 12, I don't remember if you said it?

A The date is February 3, 1942.

Q Has it been in your possession ever since it was received?

A It has.

Q No. 13, what is that?

A This is a letter written by Clifford Anderson to the Office of Naval Officer Procurement, Chicago, Illinois. It is a copy of the letter. I do not know exactly why it was in my possession, but since Clifford Anderson was an associate and a subordinate of mine, I presume he gave me a copy for information. The date is August 13, 1942.

Q Has it been in your possession ever since --

A Yes.

Q -- it was received. No. 14, what is that?

A No. 14 is a letter from Clifford Anderson.

Q Is this a carbon copy?

A It is a carbon copy of a letter from Mr. Clifford

Anderson to the Officer in Charge, Naval Ordnance Laboratory, dated August 24, 1942, and again, it was probably given to me for information.

Q Has it been in your possession ever since you received it?

A It has.

Q What is No. 15?

A This is a letter from Mr. Clifford Anderson to me.

Q Is this an original of a letter?

A It is the original of a letter.

Q Was it received by you through the mail?

A I believe it was.

Q Do you have any way of fixing the date?

A No, I do not.

Q Has it been in your possession ever since it was received?

A Strangely enough, I remember his last remark, almost the last remark -- no, the P.S., for some reason I remember the P.S.

Q Does that help you fix the date of the letter?

A It does not, no.

Q Does reference to the addresses contained in the letter help you fix the date?

A Repeat that.

Q Does reference to the addresses that are in the letter help you fix the date?

A No, they do not.

Q With respect to Exhibit 16?

A That is a postcard written by Mr. Clifford Anderson to me.

Q Can you by referring to the postmark, fix the date?

A The postmark is September 5, 1942.

Q Was it received by you on or about that date?

A It was.

Q Has it been in your possession ever since?

A Yes.

Q Will you please turn to Exhibit B-2, document 17. What is that?

A This is a print out made in my presence at the Bell Telephone laboratories. By memory, I will say West Street in New York. It represents a complex computer for multiplying and dividing complex numbers.

Q In the upper left-hand corner of No. 17 there is some handwriting?

A There is.

Q Whose handwriting is that?

A That is my handwriting.

Q There appears in your handwriting there a date?

A There does.

Q Was the handwriting put on this document, No. 17, on that date or a different date?

A I imagine it was put on at a different date.

Q Do you have a recollection of the occasion upon which you put the date on Document 17?

A I do not.

Q Was it after becoming involved in this litigation as consultant or before?

A To the best of my knowledge and belief, it was before. I wouldn't -- I have a reason for this.

Q State the reason.

A I wouldn't touch a document since becoming involved in this litigation.

Q Well, now, by that, of course, you mean you wouldn't physically mark a document?

A I mean, I wouldn't think of defacing or writing upon a document since becoming involved. I even had to stretch my conscience a little bit to allow me to put the stamp 0017 on the bottom of this document.

Q All right. In any event, can you tell us about how long No. 17 has been in your possession?

A Since the date in question.

Q No. 18 through 23 and 24 through 26 are next in Exhibit B-2. Can you identify the source of those reproductions which you have in your file?

A I believe that these reproductions were supplied me

by counsel for the plaintiff in the present litigation.

Q All right. And have been in your possession only since that time?

A That is true.

Q Did you see the original articles that were published in the publication Datamation, of which these exhibits are reproductions?

A I did not otherwise.

Q Will you turn, please, to Exhibit B-3, document No. 27. Do you have that before you?

A Document No. 27, yes, I have it before me.

Q Well, excuse me. Will you identify by number the first document that is in Exhibit B-3?

A 0335 is the first one I have here.

Q 335?

A Yes.

Q What is it?

A This is a contract between Mr. Clifford Berry and myself dated October 6, 1941.

Q Does it bear signatures?

A It bears the signatures of myself, of Clifford Berry and of a notary.

Q Are those original signatures?

A They are original signatures.

Q Do you have any knowledge of information about the

notary public other than the fact that she apparently notarized this document?

A I do not.

Q Is this a signed original?

A This is a signed original.

Q Has it been in your possession ever since it was executed?

A It has so.

Q What is the next document number in Exhibit B-3, please?

A 0027.

Q What is it?

MR. DODDS: Excuse me. In the file we have, we have two documents with the number 0027.

THE WITNESS: I only have one.

BY MR. HALLADAY:

Q The document which you have which is No. 0027 before you, does it have any other numerical identification on it?

A It looks as if it was originally marked 28 and corrected to 27, but I believe that 27 is firm because it has a repeat of the 0027 in a different place.

Q In any event, just for the preservation of identity of documents, the one which you have before you that has -- does it have an unobscured 0027 on it?

A Does it have --

Q An unobscured, unchanged 0027?

A It does.

Q Does it also have 0028 which also has either underimposed or superimposed a 7?

A It does.

Q In connection with the 8.

MR. DODDS: Off the record.

(Discussion off the record.)

BY MR. HALLADAY:

Q Is the document which we have just been referring to numbered by hand?

A It is.

Q What is it?

A This is a document prepared by the hand of Clifford Berry.

Q Can you fix --

A It is a 9 triode logic circuit which was originally conceived by Mr. Berry.

Q Do you know approximately when that document was made up by Mr. Berry?

A It was made up in the fall of '41.

Q Will you turn to the next document in Exhibit B-3, please? What number does it bear?

A It bears the number 0029.

Q Is it a handwritten number or a machine stamped

number?

A It's a handwritten number.

Q What is that document?

A I have not examined this document for its scientific content. I believe that it is a result of tests by Mr. Clifford Berry of the performance of the 5 tube -- 5 envelope or 9 triode circuit herein contained, herein previously discussed.

Q Directing --

A And the number of that document is 0027.

Q Directing your attention to documents in Exhibit B-3 that are handmarked 0027, 0028, with a 7 in part involved in the 8, and the second document marked in hand 0029, are these reproductions of some kind in your original file?

A They are reproductions, yes.

Q All right. Turning to the next document in your exhibit B-3, is the next set of documents in your file clipped together by a paper clip?

A They are.

Q I didn't hear your answer.

A They are.

KT,=17
A#4
4/1/17

Q And do they, can you say whether or not the next set of documents except for the serial numberings thereon are or are not handwritten original documents?

A These are handwritten original documents except for the numbers thereon.

Q And the numbers thereon, are they put on by a machine stamp or hand?

A They are machine stamped.

Q Is there a document stamped 27, a document stamped 28 and a document stamped 29?

A There is.

Q Is there also a small document clipped by a paper clip to the face of 27 which has no number on it?

A There is.

Q And that that is not numbered has handwriting on it, does it?

A It has.

Q Whose handwriting is it?

A That is my handwriting.

Q When was that handwriting made?

A Perhaps 18 months ago.

Q Then the documents which are machine stamped 27, 28 and 29 in your Exhibit B-3, are those the originals of which the previous 27, 28 and 29 are copies?

A They are.

4-2-18

Q And now by referring to the machine-stamped 27, 28 and 29, can you say when those handwritten notes were made up?

A In the fall of '41.

Q By whom?

A By Mr. Clifford Berry.

Q Are all of the handwritten notes on the machine-numbered documents 27, 28,29 in Mr. Berry's hand?

A Yes. Except the note appended thereto.

Q When you say the note, that's the document that has no number on it?

A It is.

Q What is the next document Exhibit 30, please?

A Zero zero three zero.

Q What is it?

A It's a letter written by Mr. -- Dean E. W. Lindstrom to me on the date of May 18, 1939.

Q Is this an original letter?

A It is an original letter.

Q Does it bear -- is it Mr. or Dr. Lindstrom's signature?

A It does.

Q Which should I say if I have occasion to refer to him?

A Dr. Lindstrom.

Q Dr. Lindstrom?

4/3/19

A Yes.

Q His position at that time was what?

A Assistant dean of the graduate school and probably chairman of the research council. The last was said with slight hesitancy because I don't remember the full strength and duty.

Q What's the next document in Exhibit B-3, please?

A The next document is the copy of a letter from me to Dr. Lindstrom under the date of May 23, 1939. This document is a carbon copy. It has been in my possession since the date thereof.

Q Directing your attention back to Exhibit 30 a moment, there are some handwritten notes thereon, do you observe same?

A I observe them.

Q In whose hand are those notes?

A I think they are in my handwriting.

Q When were they put on?

A At the time in question.

Q And down beneath the postscript on Exhibit 3 there is a marking, looks like a symbol of some sort, can you explain what that is or do you know anything about it?

A "hk," h-k".

Q Beneath what I have called postscript, a reference to some dollars and two words, immediately below that is what appears to be a symbol?

4-4-20

A That is in my handwriting. Of the meaning of that symbol I have no knowledge.

Q All right. Exhibit 31 then you have said, I think you have said already, is a copy of a letter. Was it written by you on or about that date?

A It was.

Q Have both 30 and 31 been in your possession ever since --

A They have.

Q -- the dates which they bear?

A They have.

Q Exhibit 32, is that next in your Exhibit B-3?

A Yes.

Q What is that?

A That is a copy of a letter received by me for information. The letter being written by Dean R. E. Buchanan to Dr. J. W. Woodrow, physics department, November 4, 1940.

Q Has it been in your possession ever since then?

A It has.

Q The next document in Exhibit B-3 is numbered 33 and 34?

A It is.

Q What is it?

A This is a letter written, it is a copy of a letter written by me to Mr. M. M. Boring of General Electric Company.

4-5-21

Q Is it a retained carbon copy of an original letter that you wrote?

A It is.

Q Did you actually mail the original or see to it that it was mailed?

A I did.

Q To the addressee shown?

A I did.

Q Has this copy been in your files ever since?

A It has.

Q Is the date May 27, 1941?

A The date of my original was May 27, 1941.

Q Exhibit 33, is that the next in Exhibit B-3?

A That is -- 1931 -- did you read the number to me?

Q No, I did not.

A I am sorry.

Q I am afraid I was looking away from you. What is the next number that you have?

A 0035.

Q And what is it?

A It is a letter written by Mr. M. M. Boring of General Electric Company to me.

Q Is this the original letter?

A It is the original letter under date of June 9, 1941, and it's been in my possession ever since.

4/6/22

Q Is the next exhibit 36?

A It is.

Q What is it?

A It is a letter from Mr. S. J. Sindeband, this man being an officer, a junior officer of the United States Navy Yard in Washington, D.C., to me under the date of April 16, 1942. This is an original in my possession and has been in my possession ever since this date.

Q The documents numbered 37 and 38, are they physically attached to No. 36 in your file?

A They are so attached.

Q What are they?

A Here is the letter written by me, copy of a letter written by me to Captain Glennon, really for Mr. Sindeband, in effect.

Q This is No. 37 you are referring to?

A Yes. No. 37. It is April -- it is written under the date of April 20, 1942. It has in the lower left-hand corner initials JVA; MJR, and I expect that is an insignia of Jean Reid.

Q Is this a carbon copy of the original?

A This is a carbon copy.

Q Was the original mailed in due course to the addressee?

A It was so mailed.

4/7/23

Q Has the copy been in your possession at all times since you made it up?

A It has.

Q Exhibit 38 is also physically attached, is it, to 36 and 37?

A Also physically attached.

Q What is it?

A It is a copy of a letter from Dean R. E. Buchanan to Mr. Clifford Berry under the date of November 19, 1941. It is a carbon copy for -- supplied me for information.

Q Has it been in your possession ever since?

A It has.

Q Would you look at Exhibits 39 and 40 from Exhibit B-3 and state what they are?

A This is a letter, a carbon copy of the letter written by me to Mr. J. C. Morris, Director, Office of Scientific personnel, under the date of April 27, 1942.

Q Was the original of it mailed?

A It was.

Q Has this carbon copy been in your possession ever since that time?

A It has.

Q Exhibit 40, what's that?

A This is a letter, probably a form letter, written by Mr. J. C. Morris, Director, Office of Scientific Personnel, to

4-8-24

me under the date of April 22, 1941.

Q Excuse me, the date?

A Under the date of April 21, 1942, correction.

Q Can you tell us now whether Exhibit 39 is in response to Exhibit 40?

A It looks likely.

Q Will you turn your attention to Exhibit 41, please, what is that? And by the way, is Exhibit 41 also, have two pages marked 41 and 42?

A It is.

Q What is Exhibit 41, 42?

A This is a letter written in the hand of Clifford Berry who was then in Pasadena, California, to me under the date of 7-26-42.

Q Is this in Mr. Berry's original hand?

A It is.

Q Has this original been in your possession ever since you received it?

A It has.

Q The next document is marked, I believe, 43, and then succeeding numbers. Do you have those documents numbered 43, 44, 45, 46, 47 and 48 before you at this time?

A I do.

Q Are they paper-clipped together in your original file?

A They are so clipped.

4-9-25

Q Is there a small sheet at the top?

A There is.

Q Of Exhibit 43 that is unnumbered?

A There is.

Q What is that small sheet?

A It is my note as to the source of this material.

Q When was that note made?

A Well, the note is dated September 5, 1967.

Q Was that the date on which the note was made?

A It was. Yes. Likely an error.

Q All right. Then what are exhibits 43, 44, 45, 46, 47 and 48 respectively?

A In order to refresh my memory, I communicated with Mrs. Berry who lives now in Altadena, California, and she supplied me this material as a result of such communication. This is a copy -- she supplied me with the original of these documents, I had them copied myself and returned the originals to her.

Q With respect to No. 43, had that particular document which was copied come to your attention before you received it from Mrs. Berry?

A I suppose so. I am not sure.

Q And did you receive the document from Mrs. Berry which you had copies on or about September 5, 1967?

4-10-26

A I did.

Q With respect to No. 44 which bears date May 2, 1944, do you have any memory of that document having come to your attention at the time of its original creation?

A I have no doubt that both of these documents came to my attention at that time. The subject matter contained in here is one of which I had knowledge and with which I kept constantly in touch. I am not positive that I saw this letter at that date. I probably did but I am not positive.

Q Referring to No. 45 which is dated May 17, 1954, was your first knowledge of that document when you obtained it to copy from Mrs. Berry? I am referring to as a document?

A This is probably my first knowledge of this document. I did on several occasions have discussions with Clifford Berry in the era of 1954 concerning computing machines. However, to the best of my knowledge and belief I did not see this document.

Q Now, at the foot of No. 45 reading sidewise is what appears to be a reproduction of another document, is that the same in your original file, is it a reproduction superimposed on a letter?

A This came from Clifford Berry's files.

Q I understand. I am trying to get the physical format. Does your original file that you now hold in your hand, No. 45, consist of a letter with a superimposed

4-11-27

reproduction of what looks like a clipping from a newspaper at the foot of it?

A It does.

Q And No. 46, is that a reproduction again of what appears to be something from a newspaper?

A It is.

Q Now, do you recall whether you received a clipping from Mrs. Berry and copied it for your file or whether you received a copy of a clipping and copied it for your file?

A I think I received a copy -- I am sorry, a clipping from Mrs. Berry and copied it for this file.

Q Very well.

A But I am not positive of that fact.

Q No. 47 and 48, what does that appear to be?

A This is a reproduction of an article which appeared in Electronics in October, 1942 of an article by Mr. Clifford Berry in regard to the subject, "Low-Frequency Timing Circuits

Q Did that article as published in the publication Electronics in October, 1942 come to your attention in the publication proper?

A It did not.

Q Was your first knowledge of it when you received documents now numbered 47 and 48 from Mrs. Berry that you can recall?

A To the best of my knowledge it was at that time that

4/12/28

I first saw this article.

Q No. 49 appears to consist of three pages, only the first of which is Numbered 49, is that correct, according to your original file?

A That is correct. That is correct.

Q What is it?

A This is a copy of the letter received by Mr. Richard from Mr. Clifford Berry and the date thereon is July 12, 1963.

Q From what course did you obtain No. 49?

A I received this copy directly or indirectly from Mr. R. K. Richards.

Q Also included in Exhibit B-3 numbered 50 is a document, what is it?

A This is Clifford Berry's thesis for the Master's Degree.

Q Is it a reproduction of that thesis?

A It is a reproduction of that thesis, yes. It is a reproduction of a bound volume residing in the library of Iowa State University.

Q From what source did you obtain this reproduction?

A I had it made. It was made under my direction directly from the document in question.

Q Did the document in question which you had copied as Exhibit 50 have your original signature on it?

A It had my original signature thereon.

4-13-29

Q Did it also have the original signatures on it of the other two men whose names --

A It did.

Q -- appear at the foot?

A It did.

Q Is this an exact copy of the thesis which Mr. Berry wrote and submitted in support of his application for a Master of Science Degree at Iowa State College in 1941?

A It is.

Q Do you know the date upon which this thesis was submitted?

A The date in my files, and I do not have it readily available in mind, of course, it was in the summer of 1941. It was at the end of the first summer session or end of the second summer session in 1941, by memory. I have since had exact information as to when this document was produced but I do not have it recorded indelibly in my mind.

Q All right, sir. And what is the next document number in Exhibit B-3, please?

A The next document is 167.

Q And dated?

A It is a letter from Jean Berry to me dated July, 1967, and received, due to complications, on the 13th of July, 1967.

Q There is a handwritten note in the upper right-hand corner, whose handwritten note is that?

4-14-30

A That is my wife's handwriting.

Q Would you turn now please to Exhibit B-4?

A B-4.

Q And is there a numbered document in that?

A 0051.

Q Now, is the original of No. 51 in handwriting?

A It is in handwriting. It is in handwriting and it is a reproduction.

Q Do you know --

A Yes, it's a reproduction.

Q Do you know when the reproduction was created?

A I do.

Q When?

A After the beginning of the current litigation.

Q Where is the original?

A I believe, I believe the original is in the files of Iowa State University.

MR. HALLADAY: It's 10:35, would it be convenient to take our morning break?

MR. DODDS: Surely.

(Recess taken.)

W-5

Q All right, Dr. Atanasoff, you have before you a reproduction of a document that's then marked 51 from Exhibit B-4, and also, there is a typed reproduction of No. 51 simply because of the difficulty involved in reading the original No. 51, and I wish you would observe, just because of the question of your files, that I have corrected the spelling of the word "honorary" on the typed copy of the original 51.

A Thank you, sir.

Q Now, with respect to the document which was copied and which is now 51, you have said you believe you had located it in the Iowa State file somewhere?

A Yes, in the files of the Iowa State Research Foundation headed by Mr. Dan -- currently headed by Mr. Dan Griffin, I believe was the source of that; to the best of my knowledge and belief, that is true.

Q Do you recognize the handwriting?

A I do not, no.

Q Will you turn now to Exhibit B-4 -- excuse me, B-5, document No. 52 and 53. Will you state what that is, please?

A This is a copy of a letter written by me to Dr. George L. Gross, G-r-o-s-s, under the date August 2, 1940.

Q Is that a carbon copy of the original?

A That is a carbon copy of the original.

Q Did you mail the original?

A I did.

Q There is handwriting on the sheet marked No. 53. Whose hand is that?

A That is in my handwriting.

Q Has this been in your possession ever since the date?

A It has.

Q What is No. 54-55?

A This is a letter written by Mr. George L. Gross to me under the date of August 20, 1940.

Q Is this an original letter?

A It is an original letter.

Q Does it bear Mr. Gross' signature?

A It does.

Q Was it received by you on or about the date which it bears?

A It was.

Q Has it been in your possession ever since its receipt?

A It has.

Q Will you refer to Document No. 56? What is it?

A This is a carbon copy of a letter written by me to Mr. George Gross under the date of August 26, 1940.

Q Did you sign and mail the original?

A I did.

Q Has this copy been in your possession ever since you typed it or had it typed?

A It has.

Q May I ask, Dr. Atanasoff, whether you can tell us if Nos. 51 -- excuse me -- 54 and 55 are in reply to 52 and 53?

A The only way is to examine the contents. You are speaking about the Gross letters, are you?

Q Yes, I am, in Exhibit B-5.

A Let's try to make the connections here. It looks as if those were consecutive letters, reply, and another letter in reply to that one during the month of August, 1942 -- I am sorry, 1940.

Q Then with respect to 56, is that in the same sequence so that we have the correspondence between the two of you in that month?

A Yes. I thought I so stated.

Q Will you turn to Exhibit B-6, please, and will you please state what Exhibits 57, 58, 59; 60, 61, 62 and 63 are?

A No. 57 is a letter received by me on or about June 2, 1966, and signed by Miss Dawn V. Henry, a lady who is in the Engineering Publications Office at Iowa State University. The date of that letter is June 2, 1966.

0058 is a letter written by me in reply to that letter, containing three pages numbered consecutively 58, 59 and 60. The original was signed by me and mailed on or approximately 10 June, 1966. This is a copy of that letter, a carbon copy.

No. 61 is a letter written by Miss Dawn Henry to me under the date of June 26, 1966. It contains two pages. The serial number attached is 61 and 62. This letter was received by me on or about that date.

No. 63 is another letter received by me from Dawn Henry, Miss Dawn Henry. This is the original letter. The date is August 8, 1966. This letter was received by me on or about that date.

E-6

Q Will you now refer to Exhibit B-7, please. Can you identify No. 64?

A No. 64 is a letter written to me by Mr. Sam Legvold. It carries a date 28 May, 1947, and was received by me, as far as I can tell, on or about that date.

Q Does it have the original abbreviated signature of Mr. -- or Dr. Legvold?

A It does.

Q Is that his hand?

A You know, you can't be a hundred percent sure in such a short signature, but I have no doubt.

Q What is Exhibit 65 --

A Exhibit --

Q -- and 66?

A And 67?

Q Yes. And 67.

A This is a handwritten letter, written by Mr. Sam Legvold to me carrying the date July 1, 1946 and received by me on or about that date. It has been in my possession ever since. I believe this to be the handwriting of Mr. Legvold.

Q What is Exhibit 68?

A 68 is included a handwritten letter written by Mr. Sam Legvold to me carrying the date April 5, 1943. This letter is signed by Mr. Legvold. It was received by me on or about this date and has been in my possession ever since.

Q Will you identify No. 69, please?

A No. 69 is a handwritten letter written by Mr. Legvold, signed, "Sam." It does not carry a date, I believe.

Q And 69, is that two pages of handwriting?

A It's two pages, 69 and 70, marked 69 and 70, is a handwritten letter and only carries, and the date line only carries the words, "Wednesday, P.M."

Q Is there any method by which you can fix the approximate date of Exhibit 69-70?

A I can fix the date by referring to the chronology, approximately.

Q Will you state the approximate date of Exhibit 69-70?

A I wish to do reference before doing so.

Q To what are you referring, the letter itself?

A No. To another document. I just -- when I take a thing like this and pick it up, I can slip a little bit, and I don't care to do so on the record.

Q Well, what other document would you like to refer to?

A I would like to refer to my chronology.

Q All right.

A I believe that this was written, this letter was written late in 1942 or in the early months of 1943.

MR. DODDS: Just a moment. I think the record should show that Dr. Atanasoff referred to his notes in a folder which he has referred to as his chronology as aiding him in fixing that date.

THE WITNESS: May I comment?

MR. HALLADAY: That is correct.

THE WITNESS: That is not correct. I didn't refer to them. I started to and found I didn't need to.

MR. DODDS: I am sorry.

BY MR. HALLADAY:

Q At least you had a piece of paper in your hand?

A I opened them like this, and I didn't even glance at them once. When I read the material I found an additional clue therein and did use that clue and gave this date without reference to the chronology.

MR. DODDS: Off the record just a minute, I don't see his signature, is it cut off? I don't need a new one, I can just write it in.

BY MR. HALLADAY:

Q Does the original of the sheet marked 70 have a signature on it that reads, "So long for now, Sam"?

A It did. It does.

Q Exhibit 71, what's that?

A This is a letter written by Mr. Sam Legvold to me. It is signed by Mr. Legvold. It is undated. It has been in my possession ever since being received.

Q Can you give us any fix on the approximate date of Exhibit 71?

A I would say that this letter was written during the year 1943.

Q Exhibit 72, will you state what that is?

A This is a letter written by me to Mr. Sam Legvold. It carries date June 10, 1942. It was written by me while visiting the United States Navy Radio and Sound Laboratory

at San Diego, California. I do not know, I suppose somehow due to a complication of files it was returned to my files. The original was mailed.

Q Do you know now whether you obtained that original at a particular time?

A I do not. Mr. Legvold had custody of my files for a time and it may well be that this material was returned to my files by his secretary due to an error.

Q Did you obtain Exhibit 72 recently?

A No. It has been in my files formany years.

Q No. 73, what is that?

A This is a letter written by me to Sam Legvold after a visit at Iowa State College during the summer of 1967. It was written from Bob Vaile's office in the Standard Research Institute on his IBM tabulator, I remember.

Q On his what?

A On his IBM tab -- IBM typewriter. I have to get this straight. It was a typewriter.

Q Would you now turn to Exhibit B-8. What is the document No. 74?

A This is a handwritten copy of a letter which I suppose was typed. I do not find the carbon copy of the typing. I just found this note in my files. It is undated. However, this is written by my hand. The subject matter

enables me to --

Q Dr. Atanasoff, will you look at Exhibit 76, please, in conjunction with 74?

A All right. Yes. This is a carbon copy of the letter of No. 74 which wasn't located by it.

Q Do I gather that 74 is a draft whereas 76 is the letter actually written and dispatched?

A That is true.

Q Is 76 a carbon copy then of a letter dated March 20, 1941, that you signed and mailed to Mr. Marvin?

A It is.

Q Then Exhibit 75, what is that?

A That is a letter written by Mr. Marvin of General Electric to me.

Q Dated?

A A letter dated March 11, 1941, by Mr. Marvin to me.

Q Has that been in your possession ever since you received it?

A It has.

Q Please refer to Exhibit B-9. What is Exhibit 77, please?

A That is a letter written by Mr. Robert Mather to me dated, well, it's undated. As far as I can see it is undated. I can estimate the approximate time of this if you wish.

Q Please do so.

A This is written during the summer of 1942.

Q What is Exhibit 78?

A This is a letter, form letter from Mr. J. C. Morris, director, office of Scientific Personnel, to me. It carries the date April 21, 1942.

Q Now, may I ask you to inspect that dating on Exhibit 78 carefully, please, and --

A Yes.

Q It looks to me like there is a strikeover in the typing.

A Yes.

Q Can you be sure from an inspection of the typing of the date?

A I would say the 2 is correct but I find that the next document seems to be in answer to this document and it carries a fixed 42, and I am sure that is the date, from other things I am sure also that this date is 42 and not 43. From the subject matter of this letter I can be sure that this letter is dated in '42 and not in '43. So I am sure the correct date is April 21, 1942.

Q For exhibit which?

A For exhibit 78.

Q Then Exhibit 79, what's that?

A That is a letter written by me to Mr. Morris,

apparently, in answer to document 78. It is a carbon copy. It is dated April 27, 1942. The original was signed and was signed and mailed by me approximately that date. It has been in my possession ever since.

Q What are Exhibits 80 and 81 contained in Exhibit B-9?

A The first is a letter from Mr. Sindeband of the Naval Ordnance Laboratory to me dated April 23, 1942. It was received by me on or about that date and it's been in my possession ever since.

Q 81?

A No. 81 is a carbon copy of the letter written by me to Captain Glennon, and this is the only correct way of addressing Mr. Sindeband who is an underling and does not get a direct address. It is in answer -- it is in answer to Document No. 80.

Q Is it a carbon copy?

A It is a carbon copy.

Q Did you mail the original or have it mailed?

A I did.

Q Has the carbon been in your possession ever since its date?

A It has.

Q What is Exhibit 82?

A Exhibit 82 is a letter written by J. C. Morris,

Director, Office of Scientific Personnel, to me. It carries the date April 30, 1942. This is an original letter. It has been in my possession. It was received by me on or about that date and it's been in my possession ever since.

Q What is Exhibit 88?

A Exhibit 88 is a letter written by me to Mr. Robert Mather, the address, it only carries a designation, "Dear Bob," but my memory suffices that this was written to Bob Mather.

Q Is this a carbon copy of an original?

A This is a carbon copy of an original letter which is mailed by me on or about that date. This copy has been in my possession ever since.

Q The date is July 3, 1942?

A Yes.

Q Turn now please to Exhibit B-10. Would you identify No. 84 and 85, please?

A No. 84 and 85 are the carbon copies of two pages of the letter written by me to Dr. John W. Mauchly. It carries a date January 23, 1941 and was signed by me, and the original was signed by me and mailed on or about that date. This copy has been in my possession ever since that time.

Q I observe, Dr. Atanasoff, in the first sentence of Exhibit 84, a reference, do you observe that same reference?

A I do.

Q By examining Exhibit 84?

A I do.

Q Have you made a search for a letter from Mr. Mauchly dated prior to January 23, 1941?

A I have.

Q Have you succeeded in finding it?

A I have not.

Q Do you recall receiving one?

A I only have the evidence presented in this letter that I received such a document.

Q In other words, have you any independent memory of the letter?

A I have no such independent memory.

Q What is Exhibit 86?

A This is a letter received by me from John W. Mauchly. It carries a date February 24, 1941. This letter is the original and has been in my possession and was received by me on or about that date and has been in my possession ever since.

Q I am not sure whether you stated the date?

A February 24, 1941, for the record.

Q What is Exhibit 87?

A 87 is a carboncopy of a letter written by me to Dr. John W. Mauchly. It is dated March 7, 1941. I signed

it and mailed the original of this document on or about that date. This copy has been in my possession ever since.

Q What is Exhibit 88?

A Exhibit 88 is a telegram addressed to me from J. W. Mauchly. This is an original telegram received by me. The date on the telegram is March 22, 1941. It is noted that the '41 is written first. This document has been in my possession ever since.

Q Is there also a time reflected on the original telegram No. 88?

A The time is 7:55 in the morning.

Q What is Exhibit 89?

A Exhibit 89 is a letter writen by Dr. John W. Mauchly to me. It is an original It carries a date March 31, 1941. This was received by me immediately subsequent to that date and has been in my possession ever since.

Q What is Exhibit No. 90?

A Exhibit No. 90 is a letter, a copy of a letter, carbon copy of a letter written by me to Dr. John W. Mauchly. It is dated April 22, 1941. The original was signed by me and mailed. The copy has been in my possession ever since this date.

Q What is Exhibit 91?

A 91 is another carbon copy of the letter from me to Dr. John W. Mauchly. It is dated May 21, 1941. This copy

has been in my possession, was signed and mailed by me, it has been in my possession ever since the date inscribed.

Q You mean the original was signed and mailed by you?

A The original was signed and mailed by me. This copy has been in my possession ever since the date inscribed.

Q Give us similar information as to Exhibit 92, please?

A Exhibit 92 is a letter written by Dr. John W. Mauchly to me. It is dated May 27, 1941. This is a, the original document. It was received by me on or about the date thereof and has been in my possession ever since.

Q 93?

A 93 is the carbon copy of a letter written by me to Dr. John W. Mauchly. It is dated May 31, 1941. The original was signed and mailed on or about that date. This carbon copy has been in my possession ever since the date inscribed.

Q Heretofore, Dr. Atanasoff, when you have identified a carbon copy of a letter and have said the original was mailed, have you intended to say that it was mailed to the addressee reflected by the letter through the United States mails with postage affixed?

A I intended that should be implied.

Q What is Exhibit 94?

A Exhibit 94 is the original of a letter from Dr. John W. Mauchly to me. It is dated June 7, 1941. It was received by me immediately subsequent to that date. It has been in my possession ever since.

Q What is Exhibit 95?

A Exhibit 95 is a letter by John W. Mauchly to me. It is unsigned. The date is September 30, 1941. It was received by me immediately following that date and it's been in my possession ever since.

7/1/31
WS KL

Q This is an original document?

A This is an original document.

Q What is Exhibit 96?

A Exhibit 96 is a carbon copy of a letter written by me to Dr. John W. Mauchly. The date shown thereon is October 7, 1941. The original of this document was signed and mailed to Dr. John W. Mauchly on or about the date at the top of the letter. It has been in my possession ever since.

Q Will you identify Exhibit No. 97?

A Exhibit 97 is a handwritten note received by me from Dr. John W. Mauchly. The original files contain the original document. It was received by me immediately subsequent to this date, and it's been in my possession ever since.

Q In the upper left-hand corner of the front of Exhibit 97 is some writing. Did you place that on the letter?

A I did not.

Q Was it on the letter when you received it?

A I believe it was. It seems to be in Dr. Mauchly's handwriting and I presume it's his telephone number.

Q Can you identify Exhibit 98?

A Exhibit 98 is another note, handwritten note received by me. It carries the date October 18, 1941.

Q Is this an original?

A The copy in my possession is the original. It was received by me substantially at the date indicated. It has

7-2-32

been in my possession ever since.

Q Exhibit No. 99, what is that?

A Exhibit 99 is a carbon copy of a letter written by me to Dr. John W. Mauchly, and carries the date October 30, 1941. The original was signed by me and sent by the United States Mails to Dr. Mauchly. This carbon copy has been in my possession ever since.

Q Dr. Atanasoff, can you tell us whether or not you have attempted to locate all correspondence or written communications flowing between you and Dr. Mauchly?

A I have tried to do this.

Q Is all written correspondence or written communications of any kind which you have been able to find contained in Exhibit B-10, that is to say, passing between you and Dr. Mauchly or between Dr. Mauchly and you?

A To the best of my knowledge and belief, this is true.

Q Do you know of any other written communications?

A I don't know.

Q Between the two of you that are not in this file, save this possible reference that is in Exhibit 84 that ever occurred?

A I don't understand this reference 84.

Q 84 was the first document which had a reference in the first sentence. My question is --

7/3/33

A I understand the point of your question.

Q I am asking --

A At the moment, at the moment I cannot recall any other document.

Q Will you turn now, please, to Exhibit B-11. Identify if you can, No. 100?

A No. 100 is a letter written by me to Professor Milne of Oregon State College. It carries the date -- it is a carbon copy of a letter written by me to Professor W. E. Milne of Oregon State College. It carries the date January 26, 1938. The original was mailed by me through the U.S. Mails to Dr. Milne, and this carbon copy has been in my possession ever since.

Q 101?

A 101 is another letter written by me to Dr. Milne. The original was mailed to Dr. Milne. This carbon copy has been in my possession ever since. The date at the top is December 7, 1939.

Q 102?

A 102 is a carbon copy of a letter written by me to professor W. E. Milne of Oregon State College. The original was signed by me and mailed on or about the date inscribed thereon.

Q And Exhibit 103?

A 103 is a letter written by Professor Milne to me.

I
7-4-34

This is the original letter in my possession. It is dated May 10, 1940, It was received by me, as far as I can determine, immediately subsequent to that date and it's been in my possession ever since.

Q I observe by looking at the preceding numbers 100, 101 and 102 that the only communication flowing from Mr. Milne to you is in 103. Have you looked for other communications from him to you?

A I have looked and I was wondering about this one-sided correspondence. I have found no others.

Q Will you now examine Exhibit B-12, please? State what that is, Exhibit 104, please.

A And 105. It is a two-page letter. The date -- this is a carbon copy of a letter written by me. The date thereon is 22 February, 1963. The original of this letter was signed by me and mailed to Dr. Orr through the agency of the U. S. Mails. This copy has been in my possession ever since the date inscribed thereon.

Q Exhibit 106 is what?

A This is a letter from Mr. Orr to me dated March 6, 1963. This is an original document. It has been in my possession -- it was received by me soon after that date and has been in my possession ever since.

Q Will you now refer, please, to Exhibit B-13?

A This is a letter written by me --

7/5/35

Q Excuse me. And you have in the exhibit, 107, do you?

A I do have Exhibit 107.

Q Will you identify 107, please?

A 107 is a copy of a letter written by R. K. Richards of Ames, Iowa, to me. It is dated March 12, 1963. It was received by me immediately subsequent to that date and it's been in my possession ever since.

Q Is this an original letter?

A This is an original copy.

Q Do you recall replying to 107?

A I believe that subsequent to receiving this letter, I received a telephone call from Mr. Richards, and this call was the only additional communication I carried out between Mr. Richards and me at that time.

Q Do you know whether or not Mr. Richards authored a book on computers, or books?

A I believe he authored, he certainly authored a book on computing machines. I believe he authored three books on computing machines.

Q In any one of them, do you recall any reference to you?

A I do.

Q Do you recall in which one?

A I do not remember the name of this copy, of this book

7/6/36

in which he has referred to me and my work.

Q Was the proof of what was put into Mr. Richards' book that referred to you submitted to you before it was printed?

A It wasnot.

Q Or before it was published, in case those happen to be different things?

A It was not.

Q Will you turn, please, to Exhibit B-14? Will you identify Exhibit 108?

A This is a letter written to me by Mr. Charles Thorne.

Q Will you state the date of Exhibit 108?

A At the top this document carries the date June 14 without the year.

Q Can you fix the year date?

A I am uncertain as to the date of this letter.

Q Is this an original handwritten letter?

A This is an original handwritten letter in the hand, written by Mr. Thorne.

Q What is Exhibit 109?

A Exhibit 109 is a letter written by Mr. Thorne to me. It carries a date at the top October 28 without the year.

Q Can you fix the year from the document?

A I cannot firmly fix the date by memory.

Q Will you identify 110?

7/7/37

A 110 is a letter written by me to Mr. Charles Thorne when he was at Pleasant Grove, Utah. It carries a date of August 16, 1937. This is a carbon copy of the original which was signed by me and mailed on or about the date inscribed at the head. This document has been in my possession ever since.

Q Will you identify 111 and 112?

A 111 and 112 are a two-page handwritten letter written by Mr. Thorne to me. This is the original handwritten copy and carries date August 19, 1937. It has been in my possession ever since the date inscribed thereon.

Q Can you tell whether Exhibits 108 and 109 went before or came after 110, 111 or 112?

A I would prefer not to do so under these circumstances.

Q All right. Will you identify 113, please?

A 113 is a copy received by me in course of a letter written by Dean R. E. Buchanan to Mr. Charles Thorne. The date carried thereon is January 17, 1939. This copy has been in my possession ever since that date, since substantially that date.

Q And you have used the term "received by you in course" which you have also used on other similar occasions. Will you state what you mean by that?

A Well, this is just the thing that happens in this case, because I was a member of his graduate committee and

7-8-38

this is an official document relevant to the work of his graduate committee. It was an action by the Dean relative to this man. Anything that happens, if I receive it just as a matter of course as a consequence of the position of which I hold, I use that term.

7/2/WS

Q What is Exhibit 114?

A 114 is a carbon copy of a letter written by me to Mr. Charles Thorne. It carries the date thereon of September 6, 1940. The original was signed by me and mailed to Mr. Thorne on or about that date.

Q Has it been in your possession ever since?

A This copy has been in my possession ever since.

Q Can you identify No. 115?

A Document 115 is an official document of Iowa State University. It is designed to indicate that Mr. Charles Thorne is enrolled in the course 699. If my memory serves me correctly, that was a course -- I am not sure which course it was, but my opinion is that this course was named Research at that time and carried a credit of two hours.

Q Is that a document that came into your possession on or about the date that appears on the reverse side?

A It is, and it has been in my possession ever since that date.

Q That date is March 27, 1964?

A It is.

7/9/39

Q Will you identify No. 116 in this file, please?

A This is a letter written -- this is a copy of a letter written by me to Professor J. L. Walsh, Department of Mathematics, Harvard University. It carries the date February 21, 1941. The original of this letter was signed by me and mailed to Professor Walsh. This carbon copy has been in my possession ever since that date.

Q 117?

A This is a copy of a letter written by me to the Institute for Advanced Study at Princeton, New Jersey. The original of this letter was signed by me and mailed to that Institute. It carries the date February 21, 1941. This copy has been in my possession ever since that date.

Q No. 118?

A No. 118 is a letter written to me by Mr. G. H. Fort, Captain, United States Navy, Head of Department of Mathematics of the U. S. Naval Academy. It carries the date April 18, 1941. In my possession is the original of this letter. It is a form letter.

Q What is 119?

A This is a carbon copy of a letter written by me. The address is the Head of Department of Mathematics, U. S. Naval Academy, Annapolis, Maryland. The date carried thereon is April 22, 1941. The original of this letter was signed and mailed by me on or about that date. It has been in my

7/10/40

possession ever since.

Q What is No. 120?

A No. 120 is a letter written by Dr. E. R. Smith of the Department of Mathematics of Iowa State College, Head of the Department of Mathematics of Iowa State College. It reports --

Q Well, without regard to its contents.

A It carries the date June 30, 1941. This original has been in my possession ever since that date.

Q Will you please identify Exhibit 121, which has two sides, and please identify the side which has the number on it first.

A The side which has the number on it first is a handwritten note from Dr. E. R. Smith to me. It carries the date August 1, 1941.

Q Is there any part of that exhibit on the side bearing the number which is in your hand?

A Yes, the numbers thereon, 22,500 and 21,750 were in my handwriting as also the names Berry, Stone, Leg. for Legvold, I suppose, and And. for Anderson. And then also $120 and $150, and 6 hours.

Q On the reverse of this document --

A I would like to --

Q Can you state --

A At that time we were very economical in the use of

7/11/41

paper and the reverse of this document shows this. This was -- it is very clear to me this was an examination paper handed to a student and returned by him to Dr. E. R. Smith, I suppose, since he used this paper to write to me. It contains some questions and there are spaces provided for the answers. I have not attempted to verify that these answers are correct.

Q In any event, this is, in effect, a piece of scratch paper with the only part that you identify for any purpose being that which has the number on it?

A That is true.

Q What is No. 122?

A No. 122 is a letter written by Mr. Charles J. Thorne to Dr. E. R. Smith of the Mathematics Department. I do not know the exact circumstances of this letter coming into my possession. It carries the date July 29, without year.

Q What is No. 123?

A No. 123, and I guess 124 is a handwritten letter in pencil signed Charles, for Charles Thorne. It was written to me. I have the original handwritten pencil copy. It carries date July 10. It was received by me and has been in my possession for many years. The year is unknown to me at this time.

Q Can you identify No. 125?

A This is a letter written by Dr. Hildebrandt to Dr. -- of Michigan, of the University of Michigan,

7/12/42

Dr. Hildebrandt, Head of the Department of Mathematics of the University of Michigan. It is the original -- to Dr. E. R. Smith, Head of the Department of Mathematics of Iowa State College. It carries the date August 4, 1941.

Q Now, attached to it by a paper clip in your file is a document marked 126. Can you identify that?

A Apparently this letter was handed to me at that time by Dr. Smith for my reply.

Q This letter, you mean 125?

A 125 was so handed. I now go to 126. Document 126 is a letter written, is a carbon copy of a letter written by me to Professor T. H. Hildebrandt, Department of Mathematics, University of Michigan, and the original of this letter was signed by me and transmitted by United States mail. This original from Dr. Hildebrandt to Dr. E. R. Smith and the reply written by me, the carbon copy of the reply written by me have been in my possession for many years.

Q Will you identify Exhibit 127 and 128 and 129? May I ask, are they all paper-clipped together?

A They are all paper-clipped together and they are apparently all one letter written on two sides of the paper. I have in my hand the original of the letter 0127, written to me by Dr. Charles Thorne. This letter was received by me soon after it was written and has been in my possession ever since. The date is unknown in part. It carries the inscription

/13/43

October 3.

Q Are the papers marked Exhibits 127, 128 and 129 all a part of the same letter or are they two separate letters, or can you tell?

A I believe that these -- I don't know whether to call them a single letter or two separate letters. I believe these were contained in the same envelope and that they represent consecutive writings before mailing by Mr. Thorne.

Q Will you identify 130, please?

A 130 is a letter, is a carbon copy of a letter written by me to Dr. Charles J. Thorne. The date thereon is October 7, 1941. The original of this letter was mailed by me to Mr. Thorne on or about the date thereon and it has been in my possession ever since.

Q Will you identify 131, please?

A 131 is a carbon copy of a letter written by me to Dean R. G. Richardson of the Graduate School of Brown University.

Q Is there physically attached to it in your file other exhibits?

A Yes, physically attached is 132 and 133.

Q State what 132 is?

A 132 is a carbon copy of a letter written by me to Mr. Charles J. Thorne. The date thereon is March 14, 1942. This carbon copy has been in my possession ever since.

Q Did you mail the original after signing it?

A I did so mail.

Q What is 133?

A 133 is a letter written by Mr. Charles Thorne to me. It carries the date March 4 and the year --

Q I beg your pardon?

A It carries the date March 12. Thank you. correction, March 12, and the year is unknown to me at the present time without consideration. I expect the date of all these Thorne letters could be worked out in the long run if it was necessary,, because I have other things to connect them with, but it's impossible under these conditions. This original letter has been in my possession ever since being received.

Q In the left-hand margin of theExhibit 133 on the front side there is some handwriting. Do you observe it?

A I do.

Q Is that in the hand of the author of the letter or is that something you wrote on there, or can you answer?

A It is my opinion that the material "Dean R. G. Richardson, Graduate School, Brown University" is in the handwriting of Dr. Thorne. The handwriting of the "J. V. -- Tell him," is unknown to me at this time.

E-8-1

Q Will you refer to Exhibit 134, please?

A I do.

Q What is Exhibit 134?

A Exhibit 134 is a letter written by me to Margaret and Charles Thorne, it is carbon copy of a letter written to Margaret and Charles Thorne, dated August 11, 1942. The original of this letter was signed by me and mailed to Dr. Thorne by the United States Postal Service. This copy has been in my possession ever since the date thereon.

Q There is handwriting in about the middle of the page of Exhibit 134, whose hand is that?

A That is in my handwriting to identify for the secretary, probably, or some other person who Max was. Max is the last name of the gentleman called Max Oldham.

Q Do you know whether or not that interlineation was on the original?

A I do not believe it was on the original. I believe this is a subsequent, subsequent marking. For one thing, no such explanation would be necessary for Thorne.

Q Exhibit 138, what is that?

A Exhibit 138 is a copy of a paper written by Dr. Charles J. Thorne and by me. This is a typed copy, but the interspersed mathematical symbols are by others, perhaps Dr. Thorne.

Q Is the typed document that you have before you

that is marked 138 a ribbon typing or a carbon typing or can you determine?

A It's a ribbon copy.

Q Do you know when that document was prepared?

A It was prepared during the years '40 or '41, I can't tell you better than that without a reference to the-- to other material.

Q Was this document published in any way in a publication?

A I believe there's a publication presently in the hands of parties here.

Q Elsewhere in your files, do you mean?

A In my files, yes.

Q Now, how long a time has it been that the document now marked 138 has been in your possession?

A It's been in my possession ever since the date it was prepared or thereabouts.

Q Will you move to Exhibit B-15, please?

A I request a momentary intermission.

(Short recess taken.)

BY MR. HALLADAY:

Q Dr. Atanasoff, do you have Exhibit B-15 before you?

A I do.

Q And in it Exhibit 135?

A I do.

Q Is Exhibit 135 in your file clipped by a paper clip to another paper marked 136?

A Yes.

Q Will you identify Exhibit 135, please?

A Exhibit 135 is a letter written by Mr. Robert B. Vaile, then at the -- then Professor of Electrical Engineering at the University of Missouri at Columbia, Missouri. The date thereon, this is an original document in my hands, the date thereon is December 10, 1939.

Q You did say in your hands, not in your hand?

A In my hands. This is an original document in my hands.

Q Yes. Now, what is Exhibit 136?

A Well, 136 is a handwritten memoranda written by Dr. R. B. Vaile and probably transmitted with 0135. He is asking me --

Q Please don't translate it.

A That's right. I am sorry.

Q Does it have a date?

A The date thereon is December 11, 1939.

Q Now, on the original which you have before you of Exhibit 136, is there writing in more than one color?

A There is.

Q Describe the colors, please?

A Well, there is some writing below in red and it contains E equals the partial of Phi with respect to A, A being the element of distance along the tube described above, and then below it something else, I suppose, minus the second partial of Phi with respect to A squared. These writings are in my hand.

Q The red writings?

A The red writings are in my hand.

Q Now, immediately to the left of the red writings on Exhibit 136 there are some other markings

A In black.

Q In black. Can you identify those?

A They are also in my hand.

Q When were those put on Exhibit 136?

A I have no direct way of knowing. It is more or less related with the subject of 136 so I presume they were just notes I made in thinking over the meaning of his description which isn't too immediately clear to me at the moment without doing a little thinking, but I am sure it's connected, these inscriptions are connected with that and probably made at that time.

Q Turn your attention please to Exhibit 137 and state what that is?

A This is a letter written by me to Dr. Robert Vaile, the date thereon is January 1, 1939. But the 1939 is crossed

off and 1940 is put by it and I imagine this is a typical error of the beginning of the year.

Q Can you tell us whether or not the strikeover of the typed 1939 and the handwritten 1940 were done by you?

A Say that again?

Q Was the strikeout or cross line through 1939 and the figures 1940 on Exhibit 137 done by you?

A They are in my hand.

Q When were they done?

A I imagine they were done at that instant, not lately.

Q All right.

A And you see there is correspondence current as of about that date and it looks as though it should be 40 anyway.

Q You mean in the preceding numbered exhibits?

A Yes, I do.

Q In Exhibit B-15?

A This is a carbon copy of a letter mailed by me to Dr. Vaile and this copy has been in my possession since the date inscribed thereon.

Q There is also additional handwriting on No. 137, immediately above the salutation, whose hand is that?

A That is in my hand.

Q When was that put on Exhibit 137?

6

A As far as I know as of that date to enable the secretary to file a copy.

Q Will you turn now please to Exhibit B-16. What is Exhibit 139? And by the way, do I have the first number appearing in your file marked B-15 -- excuse me, B-16?

A B-16. You do.

Q I notice that the last number in Exhibit B-15 was 37 then and the first number in B-16 is 39. Was there a 38 that was eliminated or was the number skipped or what is the explanation?

A There have been no -- I suppose that ultimately I will have to make a general statement on the record to this affair.

Q All right.

A There have been, to the best of my knowledge and belief, no deletions of material from the files and those are skipped numbers at this point. There have been a slight rearrangement of files but no material has been deleted, and you can be sure such skipped numbers do not represent a deletion of material from the files.

Q Will you again go back just to illustrate a point I am working on now, Dr. Atanasoff, to exhibit B-14.

MR. DODDS: Off the record a moment.

I notice 138 is in B-14.

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MR. HALLADAY: That's what I was having him point out.

MR. DODDS: I am sorry.

BY MR. HALLADAY:

Q Go back to B-14, Dr. Atanasoff. I think you have B-15 before you.

A All right. I see. B-14, 138 is, Item 138 is found in B-14.

Q Thank you. So that if there have been numbers that would otherwise be consecutive that have been skipped, it, I gather, has not been because the document has been so numbered and then eliminated?

A That is true.

Q Well, what is 139?

A Well, 139 seems to be the first page of a long serie of records extending from 139 to 145 inclusive.

Q Are there also attached -- did you say 139 to one what?

A I'd better revise that answer. I think it was in error. Let me go over it very carefully. First take the four sheets which are labeled 139 to 143 inclusive.

Q All right. What are they?

A These represent material obtained from Professor Howard Aiken of Harvard University, and they were received by me on April 26, 1940, and this fact is inscribed on the

bottom of page 143 or --

Q Page 4, No. 143?

A Page 4, No. 143, right.

Q You say received by you?

A What?

Q You say received by you?

A Yes.

Q Do you recall --

A The occasion?

Q How you received pages 139 -- excuse me, Exhibits 139, 140, 141, 142 and 143?

A These were received by me by hand from the hand of Mr. Aiken, Professor Aiken of Harvard University, on the occasion of a visit there.

Q Then turn to Exhibits Numbered 144 and 145, where did you obtain them from?

A I also received these documents from the hands of Mr. Aiken. He ascribes these two pages to Dahlem, to another man by the name of Dahlem.

Now, without knowing, it's my opinion that I received the material probably in bad form and that this material does not represent the exact documents received from Mr. Aiken but copies in our -- in our own secretarial -- by our own secretarial staff at Iowa State University.

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-8-2

Q Can you state when these particular documents then were typed up?

A I cannot.

Q Can you say where you were when they were typed up?

A Well, I remember my visit to Aiken, I remember he gave me material and I imagine I either needed a typing of that material to get additional copies for ciculating to others like, perhaps, Mr. Clifford Berry. It wasn't easy to get copies in those days, you will remember, so that it would have been perhaps the easiest method of getting copies, and at that time the notes here, the notes on the bottom were dictated by me to a secretary and were added to explain this material. I would say it's in the days immediately after my return to Ames from visiting Dr. Aiken.

Q Then what is Exhibit 146?

A Well, Exhibit 146 is a letter written by me to Dr. A. E. Brandt, the date thereon is January 5, 1939. This is a carbon copy. The original of this letter was mailed by me to Dr. Brandt.

Q There appears to be a handwritten mark about in the middle of the page of 146, do you find that?

A I do.

Q In whose hand is that made?

A That is in my hand.

Q Was the original so altered or only the copy?

A Well, my memory I do not know, but inference I would say that the original was so altered upon reading it.

Q What is Exhibit 147?

A 147 is a letter written by me to Mr. William G. Parmenter, the date thereon is September 30, 1941. In my hand is a carbon copy of it. The original of this letter was mailed by United States mail to Mr. Parmenter.

Q What is Exhibit 148?

A This is -- I have in my hand a carbon copy of a letter written by me to Mr. W. D. Anderson, date thereon is September 6, 1940. The original was mailed to Mr. Anderson on or about the date thereon. All of these documents have been in my possession since the date of their origin.

Q Who is Mr. William G. Parmenter?

A Mr. William G. Parmenter was a man who went to the University of Florida with me. This relationship terminated in 1925.

Q Is he still alive?

A To the best of my knowledge and belief.

Q Who is Mr. W.D. or Willie Anderson?

A W. G. Anderson is a man with whom I was associated as far back as the year 1913. He was a boyhood friend.

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I went to school with him in part. This relation has survived to the present date.

Q Can you identify Exhibit 149, please?

A Exhibit 149 is a letter written by Mr. F. W. Bubb of the Washington University at St. Louis to me.

Q Dated?

A This is the original of that letter. The date thereon is November 25, 1939. This letter has been in my possession since a little subsequent to that date.

Q Will you next look at Exhibit 151 and can you identify that?

A This is a letter written by me to -- this is a carbon copy of a letter written by me to Mr. F. W. Bubb of Washington University in St. Louis. The date thereon is December 5, 1939. This letter was evidently in reply to item 149.

Q Was the original of it mailed?

A I believe the original of it was signed by me and mailed to Mr. Bubb.

Q Is there a handwritten interlineation in the fourth line from the bottom of Exhibit 151?

A There is.

Q In whose hand?

A That is in my hand.

Q Do you know whether or not that interlineation was

made on the original?

A I am not sure it was. I must infer, I do not know by actual memory.

Q What is Exhibit 150?

A Exhibit 150 is a letter written by Professor Bubb of the Washington University staff, Mathematics staff, to me in reply to my letter of December 5. I have the original in my hand. It was received by me soon after December 12, 1939, and it's been in my possession since that date.

Q And then the last inthe file -- excuse me, in the grouping appears Exhibit 152, what is that?

A This is a carbon copy of a letter written by me to Professor Theordore H. Brown of the Harvard Business School. To the best of my knowledge and belief, the original was signed by me and mailed to Mr. Brown on or about the date thereon and this copy has been in my possession ever since.

Q The date?

A August 12, 1937.

Q Physically speaking, does your original file have paper clips holding together certain of these exhibit numbers which you have just been identifying,and if so, what documents are paper clipped together in your original file?

A In my original file are the documents with the

number 0146, 0147, 0148, 0149, 0150, 0151, 0152, are paper clipped together.

MR. HALLADAY: It's now 12:35. Should we recess?

MR. DODDS: That's agreeable.

MR. HALLADAY: Until 2:00.

THE WITNESS: I will.

(Whereupon a recess was taken until 2:00 o'clock P.M., November 13, 1968.)

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V ; KL

November 13, 1968
2:00 o'clock p.m.

Whereupon,

JOHN V. ATANASOFF,

having been previously sworn, resumed the stand and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

BY MR. HALLADAY:

Q On the record. Dr. Atanasoff, referring to Exhibit B-16, would you turn to Document 153, please?

A I have 153.

Q Is that physically attached by a paper clip to Document 153-B?

A It is.

Q And 154?

A Yes.

Q Will you identify 153, please?

A 153 is a letter from me to Dr. Duncan Stewart of the Barber Coleman Company, dated September 8, 1941. It is a carbon copy of a letter that I wrote that I have in hand. The original was transmitted by U. S. mail to Dr. Stewart at the date thereof.

Q 153-B is what?

A 153-B is another letter from myself, copy of a letter from myself to Dr. Duncan Stewart of the Barber-Colman Company.

9/2/46

It is dated June 2, 1941. The original of this letter was signed and transmitted by U. S. mail to Dr. Stewart. I have had this copy in my possession since the date thereof.

Q I know you are referring to him in your testimony as Dr. Stewart.

A I just happen to remember, you see.

Q Whereas the letters are addressed to him as Mister. It's one and the same person, is it?

A It is, yes.

Q What is Exhibit 154?

A Exhibit 154 is a letter transmitted from Duncan J. Stewart to me, dated May 14, 1941. I have the original. It has been in my possession since the date thereof.

Q What is Exhibit 155?

A 155 is a letter to me from Alan Hazeltine, dated May 2, 1941. I have the original and I have had it in my possession since approximately the date thereof.

Q Will you identify Exhibits 156 and 157, telling me in the process if they are physically stapled together in your original file?

A They are. Exhibit 156 is a copy of a letter from myself to Mr. H. R. Hirsch, President, Hirsch Laboratories, Incorporated. The copy of the letter is in my possession. The original hereof was signed by me and transmitted to Mr. Hirsch at the date thereof. The date thereof is

'3/47

September 6, 1940.

Q 157?

A 157 is a letter to me from B. L. Hirsch, President of Hirsch Laboratories, Incorporated. I have the original of this transmission. It is dated September 4, 1940. It has been in my possession since the date thereof.

Q There is some handwriting in the right-hand margin of 157. Do you see that?

A I do.

Q Whose hand is that?

A This is my hand.

Q When was that put on there?

A I suppose approximately the date hereof, but I don't know.

Q When you say the date hereof --

A I mean September 4, 1940. Now, it could have been later but I don't know what it's about, and it isn't, I believe, relevant to the matters here.

Q Can you say whether 156 is in response to 157?

A It seems that this is true.

Q Can you identify 158?

A 158 is a letter written to me by Harold Hotelling of The Institute of Mathematical Statistics. The date hereof is 28 April, 1941. I have the original. It has been in my

9/4/48

possession since approximately the date hereof.

Q Do you have a recollection of replying to this letter?

A Yes, I had to reply and I had to reply in the negative. I don't know whether there is a reply here. Perhaps there is and perhaps there isn't, but I remember replying in the negative to this letter.

Q Would you now look, please, at Exhibit 159 and 160, a two-page document. Tell me if that two-page document is attached by paper clips to 161 in your file?

A It is not attached to 161 in my file at this moment.

Q All right, sir.

A It could be properly because they involve the same person.

Q From my position at the table here, I observe there are rust marks from paper clips on the two documents or three which you are holding in your hand. Is that a correct observation from where you are sitting?

A It is correct.

Q In terms of your filing, can you say now that the originals of 159, 160 and 161 appear to have been paper-clipped together by ancient rusty paper clips for some period of time?

A I cannot say with fidelity that this is true, but many people have handled it, and they can be appropriately stapled together since they involve the same person.

9/5/49

Q All right. What is 159 and 160?

A 159 and 160 is a letter to me from Mr. Millard McVay, a former student at Iowa State University, and is written from Washington, D.C., where Mr. McVay went to work for the Naval Research Laboratory. I have the original of this letter in my hand. It is dated September 20, 1939.

Q 161, what is that?

A I have had it in my possession since approximately the date hereof. 161 is my reply to Mr. McVay, dated November 20, 1939. I have a carbon copy of this. The original of this letter was signed by me and transmitted to Mr. McVay at approximately the time hereof.

Q Please look next at 162.

A May we go off the record a moment?

MR. HALLADAY: Agreeable with me.

(Discussion off the record)

BY MR. HALLADAY:

Q Dr. Atanasoff, do you have before you Exhibit 162?

A I do.

Q And are there some succeeding numbered exhibits that are physically fastened by paper clips to 162?

A There are.

Q Will you state the number of those of which are so clipped together?

A 162, 163, 164, 165, 166, 167.

F-10-1

Q Will you please identify 162?

A 162 is a letter by me to Mr. Dunham Jackson, Dr. Dunham Jackson, a professor at the University of Minnesota in those years. This letter is, I have a carbon copy of this letter, the original was signed by me and transmitted by United States mail to Dr. Dunham Jackson. The date here of July 1, 1940.

Q The carbon copy of your 162 has been in your possession ever since it was written?

A It has so been.

Q Please identify 163?

A 163 is a letter from myself to Dean H. V. Gaskill. It is a carbon copy. The original of this carbon copy was signed by me and transmitted to Dean H. V. Gaskill at approximately the date hereof, June 10, 1942. It has been in my possession since that time.

Q What is 164?

A 164 is a letter from myself to Professor E.R. Smith, head of the Department of Mathematics of Iowa State College. I have a carbon copy. The original of this copy was signed and transmitted to me -- by me to Dr. E. R. Smith. The date hereof is June 10 and I have had this copy in my possession since approximately the date thereof.

Q 19 what?

A 19 -- I am sorry, 1942.

Q What is Exhibit 165?

A Exhibit 165 is a carbon copy of a letter written by me to Dr. J. W. Woodrow, head of the Department of Physics of Iowa State College. I have a carbon copy of this letter. The original of this letter was signed by me and transmitted by United States mail at approximately the date hereof which is June 10, 1942, and I have had this copy in my possession since the date hereof.

Q Identify 166, please?

A 166 is a carbon copy of a letter by me to Mr. Sam Legvold of the Department of Physics of Iowa State College, Ames, Iowa. I notice that it says University of Iowa, but this wasn't true at all at any time. There is an error in the salutation there. It was typed for me by somebody called F. M., and I don't know who in the world that was. I guess it's a girl out at San Diego or somewheres. This carbon copy -- the original of this carbon copy was signed by me and transmitted to Mr. Legvold by United States mail. I have had this copy in my possession since June 10, 1942, the date hereof.

Q I notice that there is a current interlineation in the second paragraph of Exhibit 166, is that contained in the carboncopy which you have before you?

A It is.

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Q If I read this correctly the word typed was fouling, f-o-u-l-i-n-g, and the interlineation changed it to the word following, f-o-l-l-o-w-i-n-g, have I correctly interpreted the interlineation?

A You have.

Q Who made that interlineation?

A Well, it's getting a bit minute to be sure, but these would be my words on that subject because I know "following" is correct for that answer.

Q Then down in the next or third from the bottom line in that same paragraph, is there a hand correction in the name Berry?

A There is. Of course, B-e-r-ry is correct.

Q Directing your attention now to these three exhibits -- excuse me, four exhibits, 163, 164, 165 and 166, all bearing the same date June 10, 1942, do you have a memory of where you were when you wrote those letters on that date?

A Well, let's see. Yes. I was in the Naval Science Laboratory in San Diego, California, in that year.

Q Then directing your attention to 167, can you identify that?

A This is a letter written by who? Parties unknown -- by Mr. S.C.Y., evidently, to Mr. George Town, Dean of Engineering, Iowa State University, Ames,

Iowa, a copy to me. I had carbon copies transmitted to me. The date hereof is September 16, 1959, and I have had this in my possession since its reception thereafter.

Q Would you turn now please to Exhibit C-1.

MR. HALLADAY: Now, I believe that the copies which you previously had, Mr. Dodds, are still those which were made on our own internal office machinery and they may be difficult to read. We have not yet had returned the commercial reproductions that we have arranged for and my though is to go forward. If there is some difficulty, I expect it will occur later if you wish to refer back then at this time, but if there is some problem presented by lack of readability and what you have before you, please say so and we will abandon this part of it and go back to it when we have more legible copies.

MR. DODDS: All right. Thank you.

BY MR. HALLADAY:

Q Dr. Atanasoff, then returning to Exhibit C-1 and Document No. 168 contained therein, can you identify the hand that prepared that document and if there is more than one hand, identify the more than one?

A This document was prepared by me.

Q Where?

A In Washington, D.C.

Q On what occasion?

A On the occasion of a visit to Washington, D.C.

Q Before you turn to anything further, let me ask the preliminary question, can you unrefreshed pick the month?

A Oh, yes.

Q Of the visit to Washington, D.C.?

A I have no difficulty picking the month. The month was either December or January. It might have been the last of December or the first of January and the only question is of the year, and it was on the occasion of the vi it by me to the patent office and several other places which will appear hereith.

Q Can you now without looking at any document, recall any event?

A Oh, yes.

Q Contemporaneously?

A Oh, yes.

Q With a visit to thepatent office?

A I don't have any trouble. I will put my memory reminder away. This was in December of '40 or early in '41. Yes. There is no difficulty at all.

Q Where were the notes that are both sides of several sides of the folded document 168 made?

A Where?

Q Where were they made?

A Well, some of them were made in the patent office and some of them may not have been. I notice some notes containing, I was just using this as scratch paper at the time. For instance, here are addresses from McVay, McCoy and Brandt whom were contacted during that visit there and they may have been -- they may have been looked up and written in the patent office for all I know. These were notes taken during the period of that visit.

Q And Exhibit 169, do you have that before you?

A I do.

Q In whose hand is that?

A That is in my hand.

Q Where if you can tell us were those notes made?

A Well, almost certainly these were made in the Patent Office of the United States on the same date as the previous manuscript.

Q 170, in whose hand is that? That's one where the copies which you have are difficult to read.

A It was not made in my hand, I do not believe in Clifford Berry's. I presume this was made by some other person in the patent office.

Q Now, directing your attention --

MR. DODDS: Excuse me. Could I look at it?

THE WITNESS: Yes. You know who made it, who wrote it?

MR. DODDS: No.

BY MR. HALLADAY:

Q Directing your attention to Exhibit 169 and 170, can you describe for the record whether or not the very paper upon which those are written is the same or is different?

A It strongly looks as if it's the same, a very cheap quality, incidentally.

Q Please then turn to 171. Is Exhibit 171 written on only one side?

A It is.

Q Is that true of Exhibit 170 also that it's only written on one side?

A And 169 also.

Q Thank you. And 171 is that on the same apparent grade or kind of paper as the two preceding exhibits?

A Yes.

Q And whose handwriting is 171 in?

A It is in my handwriting.

Q Do you recall the occasion on which that handwriting was done?

A On the occasion of my visit to the United States Patent Office.

Q That you have heretofore dated for us?

A Correct.

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10/2/1/50
EA

Q Look at, please, Exhibit 172. First, is that on the same kind of paper as 171?

A It is.

Q And in whose handwriting is 172?

A In my handwriting.

Q When was that made?

A I believe on the same occasion. I do not know the meaning of the legend thereon but maybe I could find out.

Q Will you look, please, at 173. Whose hand is that in?

A 173 is written by the hand of Mr. Clifford Berry.

Q Is that written on one side or more than one side?

A More than one side.

Q On what kind of paper is it written?

A It's written on yellow paper, yellow legal note paper.

Q With a border or margin on one side and ruled lines?

A Yes. With the usual lines to keep a person straight

Q Is the entire document on both sides entirely in Mr. Berry's hand?

A Well, none of it is in my hand, and it looks to me as if it's Clifford Berry's hand. Ultimately this would have to be determined by an expert, I presume, but --

Q Were you present at the time these notes were made

10/2/2/51

by Mr. Berry?

A I certainly was.

Q When was this?

A This was perhaps the last day or two of December or else in early January of 1941, December of 1940 or early -- right, early January of '41.

Q And turning your attention to 174, is that, again, a yellow sheet?

A It is.

Q Is that written on one side or more than one side?

A One side.

Q Excuse me.

A Do you want to see it?

Q Yes. If I might, you are looking at 175.

A Oh, I am sorry. What number did you say?

Q 174.

A Oh, I am sorry.

Q Now, again?

A That is written on two sides.

Q 174 is written on what, two sides?

A Two sides.

Q Very well.

A Entirely by my hand.

Q Was this written on the same occasion as you previously described?

A Same occasion previously described.

Q 175, is that one side?

A One side.

Q Is that -- on what kind of paper is 175 on?

A Same kind of legal paper used by lawyers in writing legal roughs.

Q Is it the same kind of paper as 174?

A It is.

Q Do you remember whether you and Mr. Berry were working on the same pad or on different pads?

A On the same side or different sides?

Q Same pad or different pads, using sheets from it alternately or how were you doing it?

A Whatever we find why that's what we wrote on, I guess. I don't know anything better about that. I can't tell you, I am sorry. We might have had -- we could even afford a pad of paper in that day, occasionally, but that's about all.

Q 176, will you look at that, please?

A Yes, sir.

Q Is that written on one or two sides?

A It is written on two sides.

Q And in whose hand? And if there is more than one hand you can identify please do so.

A It was not written in my hand. I believe it was

written in Mr. Clifford Berry's hand because of the subject matter.

Q Do you find any entries there on either side of 176 in your hand?

A I do not.

Q Is Exhibit 176 on the same kind of legal foolscap as the preceding exhibit?

A It is.

Q 177, is that before you?

A It is.

Q In whose hand is that?

A Well, it's written on one side and the lower entries are in my handwriting, -- no. There are really three entries on the page. First is in Clifford Berry's handwriting and the next two in mine, and the last one -- there are really four entries on the page, the first one in Clifford Berry's hand, the next two in mine and the last one in Clifford Berry's hand again.

Q Is this on the same kind of yellow legal type paper as the preceding ones?

A Yes.

Q Is this again at the same time on the same occasion?

A It was.

Q What is 178?

10/2/5/54

A 178 is a sheet of the same kind of paper written on one hand entirely by me.

Q You say written on one hand?

A On one side.

Q Thank you.

A Entirely by me.

Q On this same or different occasion?

A On the same occasion.

Q What is 179?

A 179 is a sheet of paper written on one side entirely by my hand on the same occasion.

Q 180?

A 180 is a sheet of paper written on both sides entirely by Clifford Berry.

Q Excuse me, 180? I notice on the back there is a small marking 0180A, whose hand is the 0180A in?

A I don't know to be sure about it. I cannot tell. That might not be in Clifford's hand, it's suspiciously like mine but I am not sure.

Q Is 180 also on this yellow foolscap?

A It is.

Q What is 181?

A 181 is the same kind of yellow paper.

Q Whose handwriting?

A It is written on both sides entirely in the hand of

10/2/6/55

Clifford Berry except perhaps for a little legend in the corner 0181A which could possibly be in my hand. I don't know.

Q The 0180A to which you referred previously on 180 and the 0181A on one side of 181, were those writings put on there while you were at the patent office on this occasion you have described?

A I have no good way of telling. It could be an attempt on somebody's part to classify the documents after we returned, but most of these documents were written, the rest of these documents were certainly written while we were there. We didn't do any rewriting of them or anything of that kind.

Q What is 182?

A 182 is another sheet of the same yellow paper.

Q Written by whom and on how many sides?

A Written on two sides entirely, as far as I can tell, in the hand of Clifford Berry on the same occasion.

Q 183?

A 183 is on another sheet of yellow paper written entirely in the hand of Clifford Berry.

Q On how many sides?

A On two sides.

Q 184?

A Another sheet of yellow paper written entirely in the hand, by the hand of Clifford Berry with the possible exception of a little legend down in the corner 0184A.

10/2/8
7/56

Q Whose hand is the 0184A in?

A I am unsure. As I stand I can't tell for sure.

Q What is 185?

A 185 is another sheet of this yellow paper written on one side entirely in my hand.

Q When was that written?

A That was written on the same occasion.

Q How about 186?

A 186. This is another sheet of yellow paper written on one side entirely in the hand of Clifford Berry.

Q 187?

A 187 is another sheet of paper written on the same occasion, another yellow sheet of paper written on the same occasion entirely -- no -- all the entries except the last one are in my hand. The last item 2,192,599, patent number, I suppose, is Mr. Lang, dated March 5, 1940, multiplying machine, I believe, is not in my hand, but in Clifford Berry's hand.

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11/1/1/57
S

Q There are some names appearing at the top of 187. Do you now have a present recollection of those names?

A I do.

Q Who were those persons whose names appear on that sheet 187?

A Well, I don't know about every one of them, but they look like to me examiners in the office.

Q In what office?

A The patent office of the United States.

Q 188?

A 188 is another sheet of yellow paper written on one hand and --

Q On one hand?

A By my hand, written on one side entirely by my hand and on the same occasion as hereinbefore mentioned.

Q 189?

A Another sheet of yellow paper of the same type, entirely written by Mr. Clifford Berry on the same occasion.

Q On the occasion of making these notes that you have heretofore identified in sequence, ending in 189, did you also order copies of any patents?

A We did.

Q Do you know whether the copies of the patents which you obtained at or after that time pursuant to those orders are in the files that you have brought here?

A They are not, I believe, in the files. I may even have some of those patents, but somehow we didn't get around to the process of sorting out the ones that may have been obtained in those occasions, and even if I had found them, I could not swear that they are the ones that we obtained on these occasions. I didn't know quite what to do about that.

Q Turn your attention, please, now to 190, 191, 192, 193 and 194, followed by 195, a two-page document.

A It looks to me as if this is the original of the typing before display of material on the computing machines which I derived from Mr. Aiken.

Q Would you turn back, therefore, to your Exhibit B-16. May I help you?

A Yes.

Q And look for 139 and following.

A Yes.

Q Do you observe any correlation between 139 and 190 and the pages following each respectively?

A I do.

Q What is the correlation?

A They seem to be, the 139 and so forth seem to be the carbon copies of 190 and so forth, 190 being the ribbon copy, 190 and so forth being the ribbon copies.

Q Thank you. So the cross references from 139 in

11/1/3/59

Exhibit B-16 and 190 and following in Exhibit C-1, have I said that correctly just for identification?

A I believe you have said it exactly right.

Q Thank you. Will you, therefore, turn to Exhibit C-2 state what the contents of Exhibit C-2 are without saying what the letters say?

A C-2 is a collection of correspondence with a patent attorney by the name of Bradley who lives in Chicago or nearby.

Q Dated in what year?

A Dated in '67. Well, some of the material must date otherwise. Yes, it does. It's late material, though, dated in these late years, I should say.

Q Will you now turn to Exhibit C-3?

A 203?

Q C-3.

A I have.

Q Another file.

A I have.

Q The next file, C-3.

A Oh, I am sorry. All right.

Q Excuse me. Will you identify Exhibit 205, please, contained in Exhibit C-3, and do you have C-3 before you now, sir?

A I do have C-3 before me.

Q And 205 therein?

11/1/4/60

A I have 205 therein.

Q What is that?

A 205 is a letter written by me to Mr. Richard Trexler of the firm Cox and Moore.

Q Written to you, did you say?

A Written by me to Mr. Richard Trexler of the firm of Cox and Moore. I have a carbon copy before me dated August 5, 1940. The original of this letter was signed by me and mailed through the United States Mails. This letter has been in my possession since that date.

Q Can you identify 206?

A 206 is a letter written by Mr. Richard Trexler, 206 and 207, the two pages comprise the letter written by Mr. Richard Trexler to me dated September 21, 1940. I have the original of this letter. It has been in my possession since the date hereof, since approximately the date hereof.

Q 208?

A 208, this is a letter written by Richard Trexler to me. I have the original. It is dated September 26, 1940. It has been in my possession since the approximate date hereof.

Q I observed, Dr. Atanasoff, that Exhibit 208 dated september 26, 1940 contains an internal reference to a letter from you of September 25th, 1940. Have you succeeded in finding your retained copy of your letter of September 25, 1940?

A If you assure me that it's not here, why I haven't.

11/1/5/61

Q Well, I can't assure you of one thing or another unless we --

A Do you want me to look for it?

Q Let me ask it this way. Unless we find your letter of September 25, 1940 as we go further through your file, then my question is, is that letter somewhere else, your copy?

A I previously testified that I have gathered together all of the material relevant and that would be included here if I had it or knew of its existence or knew where it was. If it is not here, I do not know where it is, but I do not know if it is here, unfortunately.

Q I understand.

A Because there are limitations to the human mind, because I have tried to check everything but I haven't got everything checked.

Q 209? Can you identify that, which is apparently a three-page document?

A Three-page document.

Q 209, 210 and 211?

A Yes.

Q The original of that document is on what kind of paper?

A It's on blue --

Q Whoops, from where I am sitting it looks green.

A Green. Green. All right, green paper usually used

1/1/6/62

for second copies, but I have the original, the ribbon copy in my hand and it was received by me at approximately the date hereof and it's been in my possession since that time.

Q The date is what?

A The date is December 20, 1940.

Q Will you identify 212?

A This is a carbon copy of a letter written by me to Mr. Richard Trexler, dated November 27, 1940. I have a carbon copy of this letter. The original was signed by me and transmitted to Mr. Richard Trexler at approximately the date hereof. I have had this copy in my hand since that date.

Q Exhibit 213 is a single sheet with blank spaces on it Can you identify that?

A It was some kind of internal paper work at the Iowa State University, evidently, because it provides for the signature of Charles E. Friley, President, and John V. Atanasoff is much below the president. I imagine it had to do with the grant from the Research Corporation. I have no other means of identifying it.

Q Will you look at 214 and see if you can identify that?

A This is a letter written by Richard Trexler to me. The date -- I have the original. The date of this is March 29, 1941. I have had this letter since the approximate date hereof.

11/1/7/63

Q 215?

A 215, this is a copy, a carbon copy of a letter written by me to Mr. Richard Trexler. The original was signed by me and transmitted to Mr. Trexler by the United States Mail. I have had this copy since the approximate date hereof.

Q Which is -- which was --

A I am sorry, I missed that.

Q I am not sure.

A May 21, 1941. I may have.

Q 216?

A 216 is a copy of the letter written by Mr. Wallace E. Barron to Cox, Moore and Olson, attention Mr. Richard Trexler. I have a carbon copy. The date of this copy is July 11, 1941, and I have had this copy since the approximate date hereof.

Q 217?

A 217, 218 and 219.

Q Are those all together as one document?

A They are all together and should be stapled together, perhaps.

Q Or paper-clipped, anyway?

A Yes. Thank you.

Q The reproduction which I have of 217 shows an indentation or marking as reproduced by paper clips. Does --

A Yes.

Q Does the physical document you have show a physical

indentation of that sort?

A Yes, it does, but it doesn't show on the others, I guess. I don't know. Maybe it does.

Q Will you identify 217, 218 and 219, if you can?

A These are three pages of a letter written by me to Mr. Richard Trexler. I have a carbon copy. The original hereof was signed by me and transmitted to Mr. Richard Trexler on the approximate date hereof. I have had this copy since that date. I note also that the letter carries a handwritten postscript on the bottom of Item 219. It is believed that this postscript was also written on the copy transmitted to Mr. Trexler.

Q There are certain handwritten interlineations, at least I observe, on page numbered 218, page two of the document?

A Right.

Q The line third from the bottom?

A The hand that wrote that I cannot discern, but that hand that wrote "acciduous" is doubtless mine.

Q That is on No. 219?

A Right.

Q Do you know whether or not those changes were made in the original transmitted to Mr. Trexler?

A I can only remark as follows: It is my habit when I receive typewritten letters from a girl to make corrections thereon and to myself make corrections also on the copy, so

11/1/9/65

that the two will be the same, identical. I have no memory as to whether on this instance that process was followed, but it has been a prolonged habit of my life.

Q Can you identify 220?

A 220 is a letter written by Richard Trexler to me. I have the original. The date is August 21, 1942, and I have had this letter in my possession since that time.

Q Heretofore, you had been naming the firm of which Mr. Trexler was associated. Do you observe some change had occurred in the firm name?

A Well, yes. I notice that Mr. Trexler now has his name on the masthead there, Loftus, Moore, Olson and Trexler.

Q Exhibit 221?

A 221, this is a letter, I have a carbon copy of a letter written by me to Mr. Richard Trexler under date of August 24, 1942. The original of this letter was signed by me and transmitted to Mr. Trexler by U. S. Mail. I have had this copy since the date hereof.

Q 222?

A This is a letter written by me to Mr. Trexler of Loftus, Moore, Olson and Trexler on the date of January 6, 1943. '42 was typed, but a correction, hand correction, '43 is made, and this had to be so because it says Washington, D.C. and I was not in Washington, D.C. on January 6, 1942, and January 6, 1943, seems more natural for this transmission of

11/1/10/66

information. The original of this document was signed by me and transmitted to Mr. Trexler by U. S. Mail. This copy has been in my possession since the date hereof.

Are we off the record?

Q No. We are waiting on the tape and I was trying to figure out something for my own purposes here.

A We are on the record?

Q Yes, officially we are on. Do you have some desire to go off for some reason?

A No.

Q If so, please say so.

A No. I was only being facetious. We can pass that.

Q And going through Exhibit C-3, Dr. Atanasoff, with you previously to now, and then I have stopped at 222, and I was about to go to 223 when I observed, looking at the succeeding documents, that there is no chronological order, apparently, at least to me, on the face of it.

A I am sorry that they were not so arranged. I thought they had been. Now, whether they were so arranged and got deranged later, I believe they must have been this way at the time that we stamped them, though.

Q Yes. Well, what I intend to ask you at this point is whether C-3 as an exhibit now has any particular organization about it other than can be discerned by the numerical order which is consistent from beginning to end of this

11/1/11/67

particular folder?

A Well, I am afraid in this case, I am sorry, but I didn't want it to be this way, but I am afraid in this case it has none.

Q All right. 223, can you identify it, please?

A 223 is a letter by Mr. Richard Trexler to me. I have the original dated October 21, 1942. This original has been in my hands since approximately the date hereof.

Q 224?

A 224 is a letter written by Mr. Wallace E. Barron to Mr. Trexler. I have a copy sent to me for information.

Q Who is --

A The date -- I beg your pardon?

Q Proceed.

A The date hereof is October 23, 1942 and I have had this copy in my hands since approximately that date.

Q Who was Wallace Barron?

A Mr. Wallace Barron was the alumni secretary of Iowa State University, a very affable and kindly man. He, however, got, became the director of the Iowa State College Research Foundation or one of the predecessor organizations thereto during World War Two, and so he was not in his normal position.

Q Who was Hiram Munn?

A Hiram Munn was a millionaire who was a resident of Ames, Iowa, a gentleman residing in Ames, Iowa, who was

11/1/12/68

reputed to be a millionaire. He owned almost everything in town and the Sheldon Munn Hotel was named after him. He was on here because he was an important man.

Q Are either of those two gentlemen still alive, as far as you know?

A Mr. Wallace Barron is.

Q Do you know about Mr. Munn?

A I don't know about Mr. Munn. I suspect not, because he must be quite a lot older.

Q Can you identify 225?

A 225 is a letter written by Mr. Trexler to Mr. Barron. I have a copy. My copy has the date October 26, 1942. I have had this copy in my possession since the approximate date hereof.

Q 226?

A 226 is a letter written by Mr. Trexler, I suspect, although it is signed Loftus, Moore, Olson and Trexler, I suspect it is signed by the secretary. I have the original. This letter is dated November 23, 1942. I have had this in my possession since this approximate date.

E-12-1

Q There is a pen written or similar note at the foot of 226, in whose hand is that?

A That is in my hand.

Q Was that put on there about the time you received the letter or when?

A Yes. I imagine so.

Q You used the term imagine so.

A Yes, you know, if that offends you from the usual point of view, I say in this case I am rather sure so.

Q The problem we have is semantical, some people will say they imagine so when they believe so, others will say they imagine so when it's pure imagination.

A Well, I am quite certain when I say imagine, I don't imagine it unless it's quite sure, and I will say I am quite certain so if you prefer, sir.

Q I only prefer you to give your best memory.

A I am sure. Yes. That is my best memory and I am glad to say that.

Q 227 and 228, a two-page document, can you identify that, please?

A These are two pages of a letter written by Mr. Trexler to me. I have the original. It is dated December 9, 1942, and I have had this letter in my possession since the approximate date hereof.

Q 229?

A 229 is a letter by Mr. Trexler to me. I have the original. It is dated December 22, 1942. I have had this document in my hands since the approximate date hereof.

Q 230, is that --

A That's reversed.

Q 230 --

A 231 -- 230 and 231 comprise a letter.

Q All right.

A Written by Mr. Richard Trexler.

Q Should the pagination be in the order of 231 to 230?

A It should. This is a letter written by Mr. Richard Trexler to me. I have the original thereof. It is dated January 13, 1943 and I have had this letter in my hand since the approximate date hereof.

Q 232, can you identify that?

A This is a letter written -- this is a copy of a letter written by Mr. Richard Trexler to Mr. Daniel Griffen, Jr. of the Iowa State University research foundation.

Q By a copy, you mean a reproduction of an original?

A I believe a reproduction. It looks like a reproduction of an original.

Q Where did you get it from?

A I am uncertain as to the source of this document. I know where it originally came from but I don't know --

Q 233?

A 233. This is a letter written by Mr. Daniel L. Griffen, Jr., of Iowa State College, secretary-manager of Iowa State University Research Foundation. Now, I have the original. It is dated July 26, 1966, and it has been in my possession since the approximate date thereof.

Q 234?

A This is a letter by Mr. Richard Trexler.

Q Is this a reproduction of a letter or is it an original?

A It is a reproduction of a letter.

Q Do you know where you came in to possession of 234?

A Yes. These two letters are related.

Q Which two letters?

A 234 and 232 are related. I notice that 232 is, first of all, though, it isn't first in our file, I believe, it wasn't first in our file. These are both reproductions from the original letter.

Q And you now recall where you came upon these reproductions?

A I believe that these reproductions were transmitted to me from the office of Mr. Daniel Griffen, Jr., secretary-manager of Iowa State College Research Foundation in an inquiry as to whether I would -- no -- let me see. Yes, an inquiry -- no. I received these letters from Mr. Richard

Trexler, evidently when he inquired of me as to whether he should process this document for the Iowa State University Research Foundation.

Q You say this document, what document are you talking about?

A The document was the green booklet, the manuscript, the document which will henceforth be named the manuscript, and I can get you some numbers on that manuscript.

Q Well, we will get to that in due time then. Is it a document which is later down in the file we are going through?

A Right.

Q 276 --excuse me -- yes. 276 is the next number which I find in Exhibit C-3?

A All right. This is the letter written by Mr. -- the original of the letter written by Mr. Richard Trexler to me under the date of November 29, 1943. It has been in my possession since the approximate date hereof.

Q 334?

A This is a letter, this is the original letter written by Mr. Richard Trexler to me under date of August 25, 1942, and it has been in my possession since the date hereof.

Q 336?

A This is a letter, this is a carbon copy of a letter

which I wrote to Dietrich and Rutley, a patent attorney's office in the Colorado Building in Washington, D.C. under date of September 18, 1937. I signed the original here of and transmitted by United States mail to Dietrich and Rutley, this copy has been in my possession since the date hereof.

Q 337. Might I just see the original of 337 which is in your hand?

A Okay.

Q Do I note that on the original in your file there is a machine stamp numbered 338 crossed out and a hand-written stamp 337 put on?

A There is.

Q The original document?

A Right.

Q Will you identify 337, please?

A 337 is a carbon copy of a letter written by me to Mr. Albert Dietrich, patent attorney, Washington, D.C. under the date of October 18, 1927, the original of this letter was signed and transmitted in the United States mail. This copy has been in my possession since the date hereof.

Q The next is 338, and may I inquire whether the original in your possession is handmarked with a number or machine stamped?

A It is handmarked.

Q Can you identify 338, please?

A This is the original of a letter written by Mr. Dietrich, Albert E. Dietrich to me. This letter has been in my possession since approximately the date hereof.

Q And the date is?

A The date being September 29, 1937.

Q Can you say whether or not the exhibit 338 is in reply to the Exhibit 336?

A It seems so. Yes. I believe it is true. The evidence is that it is true.

Q And Exhibit 337 in reply to 338?

A Yes.

Q Can you identify 339?

A 339 is a bill received from Mr. Albert Dietrich for services relative to the subject matter of the current litigation.

Q Dated when?

A Dated September 29, 1937.

Q Did you pay it?

A I believe so.

Q Refer to 340, does that have two stamps on it?

A It has a 336 and a 340 on it, and the 336 is crossed off.

Q Does the succeeding second page of that document

also bear identification with a machine s tamp 337 and also 341?

A Yes.

Q But the lower order crossed out?

A Right.

Q Identify that if you can, please?

A This is a letter from Mr. Albert E. Dietrich to me. I paid it.

Q You mean you paid the previous bill?

A Yes. I am just reading that I paid him. I wasn't quite sure.

Q 343 --

A You want me to identify this?

Q 340, 341, please identify it?

A Yes. This is the original of a letter written by Mr. Albert E. Dietrich to me under the date of October 25, 1937. This letter has been in my possession since approximately that date.

Q 342?

A 342. This is a letter written by --

Q Excuse me. I should have said a two-page document, 342, 343, can you identify that?

A Right. This is a letter written to me by Dr. A. E. Brandt under the date of January 12, 1940. This letter has been in my possession since the approximate date hereof.

end

E-12-2

Q 344, can you identify that?

A 344 is a letter from me to Martin T. Fisher under date of July 27, 1940. I have a carbon copy. The original of this letter was signed by me and transmitted by U.S. mail.

Q Were duplicates of this letter sent other than to Mr. Fisher?

A They were also sent to Mr. Pederson and Mr. Wolk, according to the entries hereon.

Q Do you recall that?

A I remember doing something like that. Yes.

Q Is this a carbon copy you kept in your file?

A This is a carbon copy. The original was signed by me and transmitted by United States mail. This copy has been in my possession since the date hereof.

Q And the date is what?

A The date is July 27, 1940.

Q What is 345?

A 345 seems to be an additional, seems to be an identical letter sent to Mr. -- to Col. Robert H. Young of Washington,D.C., similar comments apply to this transmission.

Q 346?

A Is a letter from Mr. Robert H. Young, patent attorney Washington, D.C., to me. I have the original under the date of July 30, 1940. This letter has been in my hand since approximately that date.

Q 347?

A This is a letter from Mr. I. Louis Wolk.

Q By the way, there are two pages, respectively --

A Two pages, 347 and 348. I have the original under the date of July 31, 1940. This letter has been in my possession since the approximate date hereof.

Q Look at 349 and 350, please, and identify that?

A This is a letter to me from Mr. Aksel Pederson I have an original under date of August 1, 1940. This letter has been in my possession since the approximate date hereof.

Q 351 and 352?

A This is a letter from Mr. Martin T. Fisher to me. I have the original under date of August 1, 1940. It has been in my possession since the approximate date hereof.

Q 353?

A This is a letter from me. This is a carbon copy of a letter from me to Martin T. Fisher. The original was signed and transmitted by United States mail and I have had the carbon copy in my possession since the date hereof.

Q Which is?

A Which is August 4, 1940. Thank you, sir.

Q 354?

A 354, 55 and 56 represent a letter from Mr. Richard Trexler to me and I have the original under date of August 9, 1940. This letter has been in my possession since

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approximately the date hereof.

Q 357, can you identify that?

A 357 is a carbon copy of a letter from me to Mr. Richard Trexler under the date of August 10, 1940, and the original of this letter was signed and transmitted by United States mail to Mr. Trexler. I have had this copy in my possession since the approximate date hereof. And also the note that -- I also note that the salutation is missing, and it's appended by hand. I still believe that this was the intent, that this was a copy of an original letter to Mr. Trexler, to the best of my knowledge and belief.

Q In whose hand is the date on 357?

A The date and mark on the salutation is in my hand.

Q When did you write the date on 357?

A I am sure the date or approximate date of transmission of this letter --

Q Which was what?

A August 10, 1940.

Q Has this copy been in your hands ever since then?

A It has so been in my hand.

Q I didn't hear that?

A It has, yes.

Q 358, what does that have, one side or two sides?

A This has two sides.

Q On the side bearing the numeral 358, what is it?

A Side bearing what?

Q The numeral 358, stamped number?

A Oh, yes. This is a note from Mr. Trexler in his hand to me, an original note under date of September 11, 1940. I have had this note in my hand since approximately the date hereof.

Q What's it written on?

A The reverse side?

Q Excuse me. What's it written on?

A Written on yellow legal and yellow legal scratch paper of the kind well known among attorneys.

Q What about the back side?

A The back side has some enumerations in my own hand and the entries are 350, adding 240 gives me 590, subtracting 420 gives me 170, "add miles via Ames." The meaning of this is unknown to me at the present time.

Q If I --

A I might add of the record I will never doodle again.

Q 359?

A This is a letter from Mr. Richard Trexler, the original under the date of November 23, 1940. I have had this original letter in my hands since approximately the date hereof.

Q 360?

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A This is a carbon copy of a letter from me to Mr. Richard Trexler under the date of November 27, 1940. The original of this communication was signed and transmitted by United States mail. I had this copy in my hands since the date hereof.

Q 361, 362, please?

A This is a letter from Mr. Trexler to me. The original of a letter from Mr. Trexler to me under the date of November 28, 1940. I have had this letter in my possession since the approximate date hereof.

Q 363?

A 363. This is an original of a letter from Mr. Richard Trexler to me under the date of December 16, 1940. I have had this letter in my hands since approximately the date hereon.

365, this is a carbon copy of a letter from me to Mr. Richard Trexler under the date of September 17, 1940 --

Q Excuse me, I think you mis-spoke.

A December 17, 1940.

Q Thankyou. I thought I heard you say September. I may have been mistaken. I don't know either. This is too fast.

In any event, December 17, 1940?

A It is so. And thanks for the correction.

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Q Did you sign and mail the original to Mr. Trexler through the mail?

A Yes. I signed and mailed the original to Mr. Trexler and I have had this copy in my possession since the date hereof.

Q 366 through 75, do you have those together before you?

A This is an original letter.

Q Dr. Atanasoff, please.

A I am sorry.

Q We are getting too good at this and the reporter can't get it if we are both talking at the same time.

A I'll bet you.

Q One of us will have to quit. My question is, does your original file include pages 366 through 75 stapled together?

A It does.

Q All right. Then identify those pages as so stated, please?

A This is an original letter from Mr. Trexler to me dated December 19, 1940. This letter has been in my possession since approximately the date thereof.

Q 376?

A This is an original letter from Mr. Trexler to me under the date of January 17, 1941. This letter has been

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in my possession since the date thereof.

Q 377?

A This is a carbon copy of a letter from me to Mr. Trexler. The original hereof was signed by me and transmitted to Mr. Trexler. This copy has been in my possession since the approximate date, since the date hereof.

Q Which is?

A I am sorry. January 18, 1941.

Q Now, there is a note -- January 18, 1941. Now, on the back appears some kind of a note, do you recognize the hand?

A The hand is mine.

Q Do you recognize the note on the back of your copy of 377 as being something that you can interpret now?

A No.

Q Can you read your own writing there?

A I know the writing but I don't know -- the first word is gramp or group or something.

Q All right.

A Ex, and the next might be girl, but it also might be grit, I don't know.

Q 378?

A 378 is an original letter from Mr. -- signed Cox, Moore & Olson, to me under the date of February 12, 1941. The original of this letter has been in my hands

since the approximate date hereof.

Q I observe 378 purports to transmit a designated copy or reprint of a patent to you?

A Yes.

Q Do you still have that reprint?

A I don't know. I don't know, no. I don't really know. It might be. I have some patents and it might be found among them, but if it was found among them it has been separated from this letter and I could not swear that it is the same as the original patent.

Q Does the file which you have collected and brought here with you include any copies of any patents?

A No. Because in each case I have been uncertain as to origin of these and unable to testify as to the origin. As far as the contents of those patents, they are well known and I recorded facts before the United States Patent Office.

Q 379, would you refer to that, please? Identify that?

A I am sure the last remark was extraneous. This is a letter, an original letter from Mr. Richard Trexler to me under the date of May 9, 1941. I have had this letter in my possession since the approximate date thereof.

Q 380?

A 380. This is a typed copy of a letter, the letter

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from Mr. Richard Trexler to Iowa State College Research Foundation, attention Mr.Wallace E.Barron. I believe this was transmitted at the approximate -- the date hereof is July 12, 1941. I believe this letter was transmitted to me at that approximate date and it's been in my possession ever since.

Q Do you recall from whom the transmittal came?

A I suppose from the office of Wallace C. Barron, otherwise I do not know.

Q 381?

A 381, this is a copy, carbon copy of a letter, of a letter written by Mr. Richard Trexler to Iowa State College ResearchFoundation,attention Mr. Wallace Barron. I have had this copy in my possession since the approximate date thereof.

Q 382?

A This is a letter from me, this is a carbon copy of a letter from me to Mr. Richard Trexler. The original was signed by me and transmitted by U.S. mail. I have had this carbon copy in my possession since the date hereof.

W-13-1

Q 383?

A That is an original number from Mr. Richard Trexler to me under the date of July 3, 1942. I have had this letter in my possession since the approximate date thereof.

Q 384?

A This is a carbon copy of a letter from me to Mr. Richard Trexler under date of August 20, 1942. The original of this letter was signed by me and transmitted by U.S. mail. I have had this copy in my possession since the date hereof.

Q Now, I observe, Dr. Atanasoff, in 384, the letter dated August 20, 1942, reference to a date of August 5th and transmission of some material. Do you find the reference?

A I do.

Q Do you have a recollection of transmitting material or having same transmitted to Mr. Trexler on or about that date?

A I cannot fix a date. I have a clear recollection of material transmitted to Mr. Richard Trexler.

Q In 1942?

A The date is approximately right, but I cannot go beyond that without reference to records.

Q In the file which you have accumulated and brought here, have you brought with you everything you could find that

would, you hoped, cast light on the information which you transmitted to Mr. Trexler from time to time?

A I have.

Q And the last item in Exhibit C-3 is numbered 408. May I ask if the one which is in your original file has two numbers on it, one machine stamped and one hand stamped or one handwritten?

A Yes. They are both the same date without question.

Q The same what?

A The same numerical value, I am sorry, not the same date, same numerical value. They are both 408.

Q What is Exhibit 408?

A Well --

Q Excuse me. Do you know whose handwriting is on 408?

A I could guess. It will be a guess.

Q Don't guess. Do you have --

A I am not sure.

Q -- a reasonable belief as to whose handwriting this is?

A I reasonably believe this is the handwriting of Mr. Sam Legvold.

Q Do you have any way of saying how you cameby this document?

A No, I really don't. I know what it relates to

very clearly.

Q We will get to that. But is the document which you have an original document?

A I would say so, yes.

Q Is it written in pencil or pen or --

A It is written in pencil.

Q Can you tell us how long you have had possession of the document now marked 408?

A Well, since a day which must have been in the neighborhood of 1942 or possibly '43.

Q On the back of 408 there is a circle with a numeral in it, so it appears to me. Can you interpret that in any way?

A That is interpreted to be doodling by one J. V. A.

Q May I see Exhibit C-3?

A Is time to get a cup of tea?

Q It surely is. Is it convenient to recess?

MR. DODDS: Certainly.

(Recess taken.)

BY MR. HALLADAY:

Q Are we ready?

A I am ready.

Q Will you turn to Exhibit, the folder Exhibit B-1, please, Dr. Atanasoff.

A D as for dog, D-1?

Q Yes, please. There it is. Do you have it?

A I do.

Q The first document appears to be 237 and 238 and are the documents in your original exhibit D-1, 237, 238, marked with a machine stamp or in hand?

A Machine stamped. Did you say 237, 238?

Q Yes. I did.

A And a copy of 237 and 238 by hand also attached.

Q All right, sir. And is one of them on a letterhead and another one of them that is numbered in hand on blank sheets of paper?

A Right.

Q All right. Would you look first, then, at the machin numbered 237 on the letterhead?

A Right.

Q Can you identify that?

A This is a letter which I wrote to the Iowa State College Research Council. I have in my hand the original under the date March 24, 1939. It was approved by Dr. Jay W. Woodrow. Since it's an outgoing letter and since it's an original, I suspect this letter was never sent.

Q Did you say never sent?

A Never sent.

Q Does the signature on the second page numbered by the machine 238 represent an actual signature of anybody?

A Jay W. Woodrow?

Q Yes.

A It does. He has approved it, but I believe that for some reason, I withheld my approval and the document was not sent.

Q And then directing your attention to the other one which is on plain paper, hand numbered 0237 and 0238, is that verbatim with the previous one?

A It is a carbon copy of the original one, I believe. I believe I verified that previously. Yes, it is. It is a carbon copy of the original one.

Q On the one written on the letterhead which is 237 machine numbered, there is a handwritten note in the upper right-hand corner. Can you read whose hand that is or tell whose hand that is?

A I am not sure.

Q The words on the copy which I have aren't legible. Can you read the words?

A On mine it says "spread out".

Q Then on the second page of that same two-page document, there is the word "believe" crossed out and written in three words "am convinced that", if I am reading

it correctly?

A Yes.

Q Are those words written in your hand?

A I believe they are.

Q Do the same changes appear on the other copy?

A Yes, but not as a carbon copy thereof.

Q They are written originally on the document itself?

A On a separate one, yes.

Q Also, the word "basic" in the first line of the last paragraph on the second page appears to have a "c" put in in hand?

A By hand, and let's see what the original one looks like. Yes. I checked three or four alterations of that kind and they seemed to agree, so the second copy is a carbon copy of the first, and we have, the evidence here before us that that document was never sent.

Q Did you, however, apply for a grant?

A I suspect so. I can't imagine failing that, but we will see if I have.

Q In any event --

A Let's look here. I might be able to tell.

Q Excuse me. Were both 237 and 238 typed up on or about March 24, 1939?

A To the best of my knowledge, they certainly were. I see no reason -- nobody was falsifying dates in my files

as of that date.

Q Have they been doing so after that?

A Not to the best of my knowledge and belief.

Q Well, then, have you had these two copies of 237 and 238 in your possession ever since this date?

A I so had them in my possession.

Q Will you look at 239 and 240, please?

A This seems to be the desired letter. I have in my hand a carbon copy of a letter from myself to Dr. E. W. Lindstrom under the date of April 9, 1940. The carbon copy is in my hand. I believe the original was signed by me and transmitted by Campus Mail to Dr. E. W. Lindstrom at approximately the date therein and that this copy has been in my hands since that time.

Q 241, 242, and 243, will you look at them, please?

A Yes, sir.

Q Can you identify them?

A These three pages represent a carbon copy of a letter from myself to Mr. Howard Poillon, President, Research Corporation, then president of the Research Corporation in New York City. I have carbon copies under the date of July 10, 1940. I believe the original of this letter was signed by me and transmitted to Dr. Poillon by U.S. mail.

Q Immediately following that is another document

dated July 10, 1940, with the handwritten number on it or set of numbers, 0241, 0242 and 0243. What is the relationship between the documents, one of which is machine numbered and one of which is hand numbered with the same numerals?

A I believe that the hand numbered is another carbon copy of the same letter which we have previously discussed under the same numbers.

Q Have each of these been in your possession since this date?

A They have.

Q Will you look at 244? Can you identify that?

A This is a letter written to me, the original of a letter written to me under the date July 18, 1940, by the secretary of Mr. Howard Poillon, whose name, I believe, is Tamm, but I can't quite be sure of that. My memory tells me that. This document was received by me at approximately the date hereof and it's been in my possession ever since.

Q 245 and 246 appear to be the next two pages in the set that I am working from. Should those two pages be --

A Stapled together.

Q -- clipped together?

A They should.

Q Does the physical appearance of the documents in your file show any evidence of having been previously held by

a paper clip?

A They do.

Q Or paper clips?

A Yes.

KL=69
WS
3/2/1/69

Q Will you identify 245 and 246?

A These two pages comprise a financial statement which was written in August, 1940, as a supplement to what I call the manuscript which will be hereinafter presented.

Q The document you have in your hand is a part of your original file. Is it a ribbon or a carbon copy?

A These are a -- well, you would say a carbon copy, wouldn't you?

Q You are supposed to use your own powers of observation or recollection. Can you tell by looking at the original document?

A I would say they are carbon -- all right, I will decide they are a carbon copy. If anybody wants to foursquare me, they can do so.

Q Handwritten in the upper right-hand corner is something. First, whose hand is that something written in in the upper right-hand corner?

A It's written in my hand.

Q What is the writing? What does the writing say?

A The writing says "August, 1940."

Q Is there some punctuation mark there?

A A question mark afterwards.

Q When did you write that on there?

A I am not sure.

Q When did you have or type up the document now marked

13/2/2/70

245 and 246?

A I typed them up during August of 1940. I know by examination of my activity at the time.

Q Did you type them up yourself or have somebody do it for you?

A It was done by my secretary as of that date.

Q Do you know who was your secretary as of August, 1940?

A I do not. That is a little doubtful.

Q Turning to 247, can you identify that?

A This is a letter from Mr. Howard Poillon to me. I have the original under the date of August 2, 1940. This letter has been in my possession since approximately that date.

Q 248, and apparently 249 is the second page of another letter. Is that a correct statement?

A That is.

Q Can you identify it?

A These are carbon -- these two pages are carbon copies of a letter which I wrote to Dr. R. E. Buchanan, Dean of Graduate College, Iowa State College, under the date of October 16, 1940. These carbon copies have been in my dates since that time.

Q Have been in your possession?

A Have been in my possession since that time. I am sorry.

Q 250?

13/2/3/71

A 250, this is a letter from Mr. Howard Poillon to me. I have the original under date of October 23, 1940. This letter has been in my hands since that time.

Q I observe in Exhibit 250, Dr. Atanasoff, a reference to a Mr. Stewart. Heretofore, you have identified a Dr. Duncan Stewart. Is this the same or a different Stewart?

A This is entirely a different Stewart.

Q Can you identify Mr. Stewart's group?

A Mr. Stewart's group means this group called the Scientific Aids to Learning.

Q Will we find further documentary reference to that?

A There will be further documentation on that. I ought to be able to tell you exactly which research foundation they were supported by. It was an anomalous group that was formed between the government and a research foundation, and the research foundation will come to me clearly later and I will so state. I have the original -- well, I have already said that.

Q 250, then, is an original letter from Mr. Poillon of October 23, 1940?

A Right.

Q 251 is what?

A I have a carbon copy of a letter which I wrote to Mr. Howard Poillon under date of November 4, 1940. The original of this letter was signed by me and transmitted to

13/2/4/72

Mr. Poillon by the United States Mail, and I have had this copy in my possession since that date.

Q I observe a handwritten correction of the spelling of Mr. Poillon's name.

A Yes.

Q Can you say who made that?

A I am not sure.

Q Was such a correction or a similar one made on the original before it was dispatched?

A I don't know. I hope so, because I know how it's spelled.

Q Would you look for a moment on the back of 250, going back just one sheet, please?

A Yes.

Q There are some markings on the back of that sheet. Are they capable of translation in any way that you can determine?

A I have no feeling as to what those markings represent

Q HAs 251, the carbon copy, been in your possession ever since it was created?

A It has.

Q 252, what is that?

A This is a carbon copy of a letter which I sent, which I wrote on November 8, 1940. The original was signed by me and transmitted to Professor R. E. Buchanan by campus mail.

3/2/5/73

This copy has been in my possession since the date hereof.

Q Now, internal reference to Exhibit 252 mentions a copy of the report, and so forth, and can you now state what that reference means?

A I am uncertain as to what that means.

Q All right, sir.

A There are two possibilities and I would have to --

Q I would rather you didn't speculate. I want your very best memory. 253, can you identify that?

A This is a carbon copy of a letter which I wrote to Mr. Howard Poillon under the date of November 8, 1940. The original was signed by me and transmitted to Mr. Poillon by United States Mail. I have had this copy in my possession since that date.

Q Again, I observe in 253 a reference to a copy of the report, and so forth, internally made.

A Without any question, this report represents the manuscript, represents a package which we called the manuscript and which will be further referred to in the records herein being processed.

Q Was the original of 253 signed by you and put into the mail on or about November 8, 1940?

A It was.

Q Addressed to the addressee?

A It was.

KL=74
14/k/1/74
EA

Q Please look at 254, identify that if you can?

A 254 is the original of a letter written to me by Mr. Howard Poillon. This original copy under date of November 18, 1940 was received by me at approximately the date hereof and has been in my possession since that time.

Q And will you please back up and refer in Exhibit D-1 to No. 245 and 246?

A Yes.

Q By referring to 254 along with 245, I observe in 254 a reference to a copy of the description of your project with the anticipated budget?

A Yes.

Q Can you say whether or not 245 and 246 represent such budget or do not?

A It does.

Q Have you had 254 in your possession ever since you received it sometime on or about the 18th of November, 1940?

A I have.

Q 255, can you identify that?

A This is a copy of a letter which -- this is a carbon copy of the letter which I wrote to Mr. Howard Poillon, under the date of December 7, 1940. The original of this letter was signed by me and transmitted to Mr. Poillon by United States Mail. This copy has been in my possession since the

14/1/2/75

date hereof.

Q 256?

A This is the original of a letter written by Mr. Howard Poillon to me under the date of December 14, 1940. I have had this letter in my possession since the approximate date hereof.

Q 257?

A This is a carbon copy of a letter written by me to Mr. Howard Poillon under the date of December 14, 1940, the original was signed by me and transmitted to Mr. Howard Poillon by U. S. Mail. This copy has been in my possession since the date hereof.

Q 258?

A 258 is the original of a letter written to me by M. Tamme, T-a-m-m-e, secretary to Mr. Poillon under the date of December 16, 1940. This letter has been in my possession since the approximate date hereof.

Q 259?

A This is a carbon copy of the letter written by me to Mr. Howard Poillon under the date of February 18, 1941. This copy has been in my possession since the date hereof.

Q Was the original of it dispatched by mail after having been signed by you on or about the date which it bears?

A Yes. I am sorry -- it was. Thank you, sir.

Q 260?

14/1/3/76

A 260 is an original of a letter written to me by Mr. Howard Poillon under the date of February 20, 1941. This letter has been in my possession since the approximate date hereof.

Q Will you next look at 263?

A 263?

Q Yes, please. Can you identify that?

A 263 is the letter written by Mr. Howard Poillon to me under the date of March 3, 1941. This letter has been in my possession since the approximate date hereof.

Q I direct your attention to the third paragraph of 263?

A I read that paragraph.

Q Would you now look at 261 and 262 and identify that if you can?

A Yes. These two pages represent a criticism of my activities.

Q Excuse me. Rather than the substance or content, just the identification, please?

A Yes. Well, instead of a letter, I call that a criticism?

Q All right. If you will stop there.

A Yes. That's as far as I wanted to go.

Q All right. Excuse me.

A Representing a criticism of my work prepared by

14/1/4/77

Mr. Alan Hazeltine for Dr. Poillon relative to my work under the date 9 February, 1941. I have the original manuscript and it has been in my possession since those days, I, of course, probably since early in March, 1941.

Q Can you tell us whether or not Exhibits 261 and 262 are the memorandum enclosed in the letter 263 from Mr. Poillon dated March 3, 1941?

A Now, it looks to me as if 261 and 262 are ribbon copies which have been prepared at the instance of Mr. Alan Hazeltine and which had been hand letters perhaps by him and perhaps somebody here can give us an idea whether that was a hand letter by him.

Q That's not an answer to the question, Dr. Atanasoff. All I am trying to find out is if you can say whether or not Exhibits 261 --

A You see --

Q -- and 262 are the memorandum that was enclosed, if any was, in Mr. Poillon's letter Exhibit 263?

A Now, I want to ask you a question before I can answer it, and I took one answer and you evidently had the other one, but I am not quite sure in mind. You mean this is the exact document or represents the document as a copy thereof or what?

Q I want your best memory as to whether or not the paper which is before you marked 261 and 262 is the same paper

14/1/5/78

that was forwarded to you and referred to in the letter from Mr. Poillon dated March 3, 1941, marked Exhibit 263?

A I believe it is.

Q Would you look at 264, please? Can you identify that?

A This is a carbon copy of a letter written by me to Mr. Howard Poillon under the date of March 20, 1941. The original of this letter was signed by me and transmitted to Mr. Poillon by United States Mail. This copy has been in my possession ever since its origin.

Q Will you look at No. 265, please?

A This is a carbon copy of a letter written by me to Dr. Hazeltine under the date of March 6, 1941. The original was signed by me and transmitted to Dr. Hazeltine by U. S. Mail. This copy has been in my possession since the date thereof.

Q Now, I would like you to refer again to your letter of March 6, 1941 to Dr. Hazeltine, or is it Hazeltine?

MR. DODDS: Tine.

THE WITNESS: Hazeltine.

BY MR. HALLADAY:

Q Exhibit 265, tell us, if you can, whether or not the "some" material that is referred to in your letter is that material which has been now marked Exhibits 261 and 262?

A I have no doubt it is. I believe it is. I am sure it is.

E-14-2

Q 266, can you identify that?

A This is a letter written by Mr. Lloyd N. Scott to Mr. Charles E. Friley, president, Iowa State College. A copy was sent to me for information. This carbon copy was received by me at the approximate date thereon and I have had it in my possession since that time.

Q I think you omitted the date?

A The date is March 24, 1941.

Q Will you identify, if you can, Exhibit 267?

A 267. This is a letter, this is the original of a letter written by Mr. Howard Poillon to me under the date of March 2, 1942. This document has been in my possession since the approximate date thereof.

Q There is a handwritten note in the upper right-hand portion of Exhibit 267. In whose hand is that?

A I do not know.

Q 268. Can you identify that?

A This is a carbon copy of a letter written by me to Research Corporation under the date of April 9, 1942. The original of this letter was signed by me and transmitted to Research Corporation by United States mail. This copy has been in my possession since that date.

Q 269?

A 269. This is a carbon copy of a letter written by me to Mr. Howard Poillon on the date of April 9, 1942.

The original of this letter was signed by me and transmitted to Mr. Howard Poillon by U.S. mail. This copy has been in my possession since the date hereof.

Q 270?

A This is a letter to me by M. Tamm, secretary to Mr. Poillon on the date of April 14, 1942. This letter has been in my possession since approximately the date thereof.

Q Is this an original letter?

A This is an original letter.

Q 271 is what, please?

A 271 is an original letter written to me by Mr. Howard Poillon under date of April 14, 1942. This letter has been in my possession since approximately the date hereof.

Q In the interest of complete accuracy, Dr. Atanasoff, will you go back to 268 and 269?

A Yes.

Q And consider those in the light of 271; 268 and 269 are both dated April 9, 1942?

A Right.

Q One is addressed to Research Corporation, one of them, 269 is addressed to Howard A. Poillon, president, Research Corporation, the address otherwise the same?

A Yes.

Q And then Exhibit 271, April 14, 1942, acknowledges, "Your letter of April 9 with the enclosed report"?

A Right.

Q Can you be certain that you wrote two letters on April 9, 1942 and dispatched two original letters now represented by carbon copies marked Exhibits 268 and 269?

A It looks peculiar, doesn't it?

Q Well, I don't know if it looks peculiar. I am trying to be as certain as we can that we have been as clear and complete as possible.

A The records say we transmitted both letters. That's what the records say, and I have no way of verifying these records for certain. There is a certain peculiarity in this situation.

Q From the standpoint of your files and your practices in those days, you are testifying that your belief is you dispatched both letters dated April 9, 1942?

A I am so testifying.

Q Very well. I think that's --Will you now identify, if you can, Exhibit 272?

A This is a carbon copy of a letter written by me to Mr. Howard Poillon under date of April 24, 1942. The original of this letter was signed by me and transmitted to Mr. Poillon by U.S. Mail. This copy has been in my possession since the date hereof.

Q Dr. Atanasoff, in your letter of April 9, 1942, marked Exhibit 269, there is an internal statement that you are enclosing a statement and several photographs. Elsewhere in your file, considering its organization, will we come upon a copy of that statement and copies of photographs as near as your memory tells you?

A I cannot remember such material in these files.

Q I beg your pardon?

A I cannot remember such material in these files.

Q Again in the letter from the secretary to Mr. Poillon of April 14, 1942, document 270, request is for 20 copies of each of seven photographs which accompanied the report referred to in Exhibit 269, and continuing on to Exhibit 272, your letter of April 24, 1942, the statement is made thatyou are sending, "under separate cover copies of the photographs of our machine which your secretary requested." Do you find that reference?

A I don't find --

Q 272 has the reference.

A I find 72 but not 270. Maybe it's hear and I have misplaced it. Let me go through this material for a little bit.

Q It's dated April 14, 1942. It's on the letterhead of Research Corporation and signed M. Tamm.

A I'm afraid that somehow I -- wait a minute. It

looks to me as if it has disappeared from my files.

Q Very well, sir. We will have to account for it. In any event, we obviously copied it from somewhere because I have a duplicate and Mr. Dodds has a duplicate.

A Right. It certainly was in my file, whether it's here now or not -- yes. I remember the letter, and I remembe receiving this and I remember preparing photographs, but I cannot remember which photographs they were.

Q All right.

A And I have no doubt that thosephotographs are at hand. The only trouble is to identify which they were.

Q That is to say, which were sent with which letter in April of 1942?

A Right.

Q Do you now recall whether any special photographs were made in April, 1942 by someone other than yourself?

A I don't have such a memory.

Q And I am retaining 270 and some time when we are off the record we will make an effort to find out what happened to the original one from your file.

A Wait a minute. We have it, just by my clumsiness--

Q You have found it?

A Yes.

KL=79
S#15
5/1/1/79

Q Very well, sir. Will you examine 272?

A 272 is a carbon copy of a letter written by me to Mr. Howard Poillon. The original of this letter was signed by me and transmitted by U. S. Mail to Mr. Poillon. The copy has been in my possession since the date thereof, which is April 24, 1942.

Q As of that time, did you also under separate cover dispatch copies of the photographs which Mr. Poillon's secretary had requested in what we know as Exhibit 270?

A I believe I did.

Q 273, can you identify it?

A 273 is a letter, the original of a letter from Mr. Howard Poillon to me under date of April 27, 1942. This letter has been in my possession since the approximate date hereof.

Q 274?

A 274 is a carbon copy of a letter which I wrote to Mr. Howard Poillon under the date of June 29, 1942. The original was signed by me and transmitted to Mr. Poillon by U. S. Mail. This copy has been in my possession since the date hereof.

Q There is a reference in Exhibit 274 to a man named Frissel. Can you identify him?

A Mr. Frissel was a graduate student at this time at Iowa State University and he later got a Ph.D. from Iowa State

15/1/2/80

College or University, and I have had a telephone conversation with him within the last two weeks.

Q And then there is also a reference in Exhibit 274 to an excellent mechanic. Can you now tell us who that excellent mechanic was to whom you referred in the summer of 1942, by memory?

A This remark would not have applied to Mr. Ike Coleman who was generally available, somebody special. I suspect that this reference was to a man by the name of Gert Weismann who had done some work on the machine and who was available, I believe, at this time for further services.

Q Do you have in your file documentation by way of payroll records to indicate who the personnel were that were working on this project from time to time?

A I do.

Q And we will get to that when we get there, then, I guess, won't we?

Exhibit 275, can you identify that?

A This is a letter, the original of a letter from Mr. Howard Poillon to me under the date of July 10 , 1942. I have had this letter in my possession since the approximate date thereof.

Q Will you turn now to file Exhibit D-2, please? Can you identify Exhibit 277?

A This is the original of a letter written by Mr. --

well, it looks like G. F. Romy, R-o-m-y, manager, to Mr. A. E. Brandt, under the date of May 31, 1934. The exact circumstances of the transmission of this letter to me are not clear, but I have had this letter in my possession for many years.

Q Could I see the original just a moment? Did that letter come from the Des Moines office of IBM, as nearly as you can tell by inspection of the original?

A It did.

Q Exhibit 278, what is that?

A This is a copy of a letter written to me --

Q Written --

A This is a carbon copy of a letter by me to Mr. Harry Titus, Vice-President, International Business Machines Corporation, under date of January 14, 1930, but appended, but the zero is crossed out and it says '37. It could not have been '30. It must have been '37, because I wasn't writing to IBM in 1930. I can't promise that it was '37 except by the correction thereon.

Q How old were you in 1930?

A In 1930 I was 27 years old. I had just gotten my Ph.D., as a matter of fact. I wasn't fooling around with IBM during that year.

Q According to the body of the letter, Exhibit 278, you said at least you were at that time 33 years old?

15/1/4/82

A That will help, won't it?

Q It should help. I am not sure we come out with 1937.

A Not exactly. Not exactly.

Q Is it your best memory --

A Well, January, yes, it would be exactly. You see, by January 14, 1937, I would have been, I would be exactly 33.

Q Plus?

A Plus, but it works out all right.

Q All right.

A All right. We are all right on that. This is a carbon copy of a letter under that date.

Q Then --

A I transmitted the original of this, I signed the original of this letter and transmitted it by U. S. Post to Mr. Titus. I have had this copy in my possession since that date.

Q Is Exhibit 279 the reply to 278?

A Yes, it is. The reply came from Assistant to the Vice-President, Mr. W. W. McDowell, and this is the original of a letter received by me from Mr. W. W. McDowell under the date of January 21, 1937. This letter has been in my possession since that date.

Q There are printed also, words at the foot of that letter. Can you identify who put those on that letter?

15/1/5/83

A That was done by me.

Q That is --

A And purports to transliterate the signature thereon which was not otherwise appended to this letter. Perhaps at the time I transliterated this signature I had additional information. Perhaps I didn't. I don't know.

Q Exhibit 280?

A Exhibit 280 is a carbon copy of a letter written by me to Mr. W. W. McDowell of International Business Machines corporation. The original of this letter was signed by me and transmitted by U. S. Post to Mr. McDowell. The copy has been in my possession since its date of January 27, 1937.

W-15-2

Q Was 280 in response to 279?

A Yes, it was.

Q I observe both refer to application blanks.

A Let's see if we find any.

Q My first question is, did you transmit application blanks with 280?

A Well, let's see if it says I did. Yes, I did.

Q 281 is a handwritten note. Whose handwriting is it?

A It is in my handwriting.

Q When was that written?

A No date is affixed but it says, evidently I have lost a letter from W. W. McDowell. It so states here --

Q I understand. I am trying to find out if you can tell us when you wrote the document that has now been marked Exhibit 281?

A I cannot tell you.

Q Was it after you became engaged as a consultant in connection with your present activity?

A Oh, no. It was many years ago. It is in the range of these dates about in 1937, as far as that goes, but I don't know the exact date. I can't furnish that.

Q What kind of paper is the original of 281 written on?

A It's written on bond paper of a kind that was

generally available around the laboratory at Iowa State University.

Q Would you describe the paper that is now marked Exhibit 281 with respect to its physical appearance? It is clean, clear? Does it look new or old? How would you describe it?

A It's very old and doubtless this was written in 1937, but the exact date -- it had to be written in 1937. Oh, I don't know.

Q Will you now turn to 283?

A 282, 283 --

Q In the copies that I amworking with it is on the front corner of a form and then there is a sheet following that, inside of which is a 282.

A Right. Now, 282, I thought, was the first document and 283 was an enclosure therewith, but suit yourself.

Q Well,I just want to have the documents that I am working with in the same order that those before you are.

A Let's put the 282 first, please.

Q 282 first?

A Right.

Q Does the physical form of 282 appear as a folder?

A It is.

Q With handwriting on all sides?

A All sides, all in my hand. No, not on the last page. There was none there; except on the last page thereof.

Q Bear with me. Is the front page of 282 entitled "Employment Questionnaire?

A It is.

Q When you turn it over, does the inside of it have the first entry printed at the top "Hobby or Outside Interests"?

A It does.

Q Reading then to the left, is there a blank sheet or is there a sheet with writing on it?

A To the right there is a sheet with writing on it headed, "Iowa State College."

Q And the printing, "Name of Employer"?

A Yes.

Q Very well. And then 283 is a separate document captioned "Application for Employment"?

A It is.

Q Is the handwriting on 282 and 283 yours?

A It is.

Q Does that represent a copy of the application in question, employment questionnaire and application form that you transmitted to Mr. McDowell?

A It does.

Q Has this been in your possession ever since you made it out?

A It has.

Q And is the date apparently on exhibit 282 following the word "date" underneath the square that seeks to have you attach a photograph?

A That says January 25, 1937.

MR. HALLADAY: Is it clear on your copy, Mr. Dodds?

MR. DODDS: Yes.

THE WITNESS: I will accept that date and the date on 283 somewhere is the same.

BY MR. HALLADAY:

Q Then 284, can you identify that?

A 284 is a carbon copy of a letter written by me under date of March 27, 1937, to Mr. W. W. McDowell. The original of this letter was signed by me and transmitted to Mr. McDowell by U.S. mail. This copy has been in my possession since 1937 and is appended by handwritten draft.

KL=84
16-1-1-84
EA

Q And the handwritten draft is numbered what?

A Is numbered 285 and 286.

Q And 287?

A It seems to cover the exact material of the letter.

Q Excuse me. Is the draft also up to 287?

A 287. It's up to 287, I am sorry.

Q Now, I ask you to inspect the handwritten draft marked 286 -- 285, 286 and 287 and compare the paper with the paper employed in 281?

A They seem --

Q Excuse me, are you comparing like --

A I am comparing it.

Q I am asking you to compare the paper of 281?

A Oh, I am sorry. I have so compared the paper.

Q The paper of 281 with the paper employed with 285, 286 and 287?

A Yes.

Q Can you state whether or not from an inspection they appear to be the same or different?

A They appear to be the same.

Q Is the handwriting on 285, 286 and 287 yours or someone else's?

A It is all in my handwriting.

Q Was the handwriting on 285, 286, 287 done by you on or before March 27, 1937?

16/1/2/85

A It was.

Q Then Exhibit 288, is that clipped with a paper clip to Exhibits 284 through 287?

A It is.

Q In your file?

A It is.

Q Can you identify that?

A That was the letter, that is the original draft, I mean the original of a letter written by me -- to me by Mr. W. W. McDowell of the engineering laboratory of International Business Machines Corporation. This letter was received by me approximately at its approximate issued date of April 6, 1937, and it's been in my possession ever since.

Q Are there two numbers on this document?

A There are two numbers.

Q Are they both the same?

A They are both the same except that one is fairly illegible.

Q Exhibit 289, please, would you turn to that?

A 289 is a carbon copy of a letter written by me to Mr. Clement Ehret, Director of Market Research, International Business Machines Corporation, New York City, New York. The original of this letter was signed by me and transmitted by United States Mail to Mr. Ehret. This copy has been in my

16/1/3/86

possession since the date hereof which is April 22, 1937.

Q Exhibits 290 and 291 and 292 and 293, are they physically attached by a paper clip to Exhibit 289 in your original file, Dr. Atanasoff?

A They are so attached.

Q What is the handwriting on Exhibits 290, 91, 92 and 93?

A They are in my handwriting, partly in pencil and partly ink.

Q Were those handwritings on Exhibits 290, 291, 292 and 293 prepared on or prior to April 22, 1937?

A They were so prepared.

Q Will you inspect the paper employed on Exhibit 290 through 293 and compare the same with Exhibits 285, 286 and 287 to determine by inspection whether they appear the same or different in quality of paper and other physical appearance?

A They appear to be the same paper.

Q Will you refer also then to 294. Is that in your hand?

A 294 is in my hand.

Q Is that on the same or different kind of paper than the preceding pages 290, 91, 92?

A That's -- it seems to be the same paper.

Q Is that in your hand on 293?

A It is in my hand.

16/1/4/87

Q What does Exhibits 290 through 293 represent?

A 290 -- you mean -- you mean 294, did you say?

Q I mean 290, 290 through 293 and then 294?

A Well, they are out of order, but the combined, these represent the original draft of the letter of 289.

Q Then 295, what is that?

A 299 -- 295 is a form letter of reply by Clement Ehret to me.

Q Dated?

A Dated April 29, 1937. This material has been in my hand since that date, since approximately that date.

Q Is that true also with respect to the preceding Exhibits 290 through 294?

A It is true.

Q Will you refer now to Exhibit 296?

A 296 has two pages. It apparently is some kind of a patent agreement which IBM is promulgating.

Q Just for clarification, does the No. 296 appear on what is the second page of the so-called agreement?

A It does so appear.

Q And if you assemble them in proper order would it be necessary that the 296 appear as the second page?

A Will you restate your question?

Q In order to have them in proper order, should the number 296 be the second of the two pages?

16/1/5/88

A It should.

Q Is it assembled in that fashion in your file?

A It is assembled in that fashion in my file.

Q Then is there clipped to the two-page document identified as 296 a separate sheet of paper in your file?

A Yes, it is.

Q Does it have any number on it by way of a --

A Date?

Q No. An identification number of the kind that we have been employing here?

A It has not.

Q What kind of paper is it on?

A It's on yellow note paper of the kind found in offices for scratch at that time.

Q Whose writing is it in?

A The writing is unknown to me.

Q There is a partial signature on that yellow sheet, can you identify that signature?

A At the present moment I do not remember whose signature that is.

Q For the record is it a "Geo. S."?

A It is that.

Q The George S. identity at the moment unknown?

A Right.

Q Has this document collectively now identified as

16/1/6/89

296 been in your possession since the date you first received it?

A It has.

Q Do you know when you first received it?

A Not exactly but I know closely because it was accompanied by a form letter from Mr. Poillon dated April 29, 1937. So without any doubt it has been in my possession since approximately that date.

Q Now, I believe you misspoke on a name, Dr. Atanasoff, and I know it's getting late in the day.

MR. HALLADAY: Mr. Anderson, could you tell me the name that he gave when he said who the letter is from dated April 29, 1937?

(The answer was read.)

THE WITNESS: I am sorry. There is an error. It should be Mr. Ehret. Will you correct that.

BY MR. HALLADAY:

Q I also direct your attention to 297. Can you identify that?

A This is a letter written by Mr. Clement Ehret to me under the date, this is an original copy of the letter written by Mr. Clement Ehret to me under date of April 29, 1937. I have had this letter in my possession since approximately that date.

16/1/7/90

Q Do I observe, Dr. Atanasoff, that you received two letters dated April 29, 1937, both over the signature or apparent signature of Mr. Ehret, one numbered 295, one numbered 297?

A That is true. But 295 was a form letter and he felt that --

Q Without regard to what he felt, 295 was a form letter whereas 297 appeared to be a different kind, is that a fair way of putting it?

A That is true.

Q Will you refer to 298, please?

A 298 is a carbon copy of a letter written by me to Mr. Clement Ehret, Director of Market Research of International Business Machines Corporation under the date of July 13, 1937. The original was signed and transmitted by U. S. Mail to clement Ehret. The copy has been in my possession since the date thereof.

Q 299?

A This is a carbon copy of a letter written by me to Mr. Clement Ehret under the date of June 17, 1937. The original was signed by me and transmitted to Mr. Clement Ehret by U. S. Mail. This copy has been in my possession since the date thereof. No. 300.

Q If you please?

A This is an original letter received by me from

16/1/8/91

Mr. Clement Ehret under date of July 21, 1937. It has been in my possession since the approximate date thereof.

Q 301?

A 301 is an original letter written to me by Mr. Clement Ehret under the date of August 31, 1937. This letter has been in my possession since the approximate date thereof.

Q 302?

A 302 is a carbon copy of a letter written by me to Mr. Clement Ehret under the date of September 7, 1937. The original of this letter was signed by me and transmitted to Mr. Clement Ehret by U. S. Mail. This copy has been in my possession since it was written.

Q I observe initials at the foot of 302, "JVA-mb." Does that give any indication as to who your secretary was in 1937, and by that I mean so that you can identify that person by name?

A No. I cannot. At this moment I cannot. I am not sure. If I really tried to probe I might be able to do it, but I am not sure.

Q Will you identify if you can 303?

A 303 is a letter written -- is the original of a letter written to me by Mr. Clement Ehret under the date of September 16, 1937. This letter has been in my possession since the approximate date thereof.

16/1/9/92

Q I note that postscript on 303 about returning a description and drawing. Do you know whether or not the file that you have attempted to collect and put together in this instance includes that description and drawing?

A I do not believe that that description and drawing, that being about anything, was transmitted to Mr. Clement Ehret.

Q I didn't understand the answer? Does the file include that description and drawing?

A I don't believe I transmitted any description and drawing to Mr. Clement Ehret.

Q Are you saying in 303 he didn't return one to you?

A Well, perhaps. I have no record of it. I know -- I am merely speaking from my motions of the moment. My motions of the moment were I would be very careful what I sent to Mr. Clement Ehret and I am sure that I was.

Q In any event --

A I do not have a copy of it, to the best of my knowledge, and believe, unless it is in this file, I do not believe I have a copy. If we find one we can perhaps identify it with this description. I don't remember any such.

E-16-2

Q All right, sir. 304?

A 304 is a carbon copy of a letter written to me -- by me to Mr. R. R. Walker of International Business Machines Corporation. The original of this letter under the date of January 12, 1940, the original of this letter was signed by me and transmitted by U.S. mail to Mr. Walker. The copy has been in my possession since that date.

305 is a carbon copy of a letter written by me to Mr. Clement Ehret of International Business Machines Corporation. The original of this letter was signed by me and transmitted by U.S. mail to Mr. Clement Ehret. This copy has been in my possession since the date thereof.

Q 306?

A 306? 306 is a -- is the original of a letter written by Mr. G. H. Armstrong, manager of engineering for International Business Machines Corporation. This letter has been in my possession since the approximate date thereof.

Q Which is?

A 307 --

Q Which is?

A Which is February 5, 1940. Boy!

Q 307?

A 307 is the original of a letter written to me by Mr. Clement Ehret on date of February 8, 1940. This

letter has been in my possession since the approximate date thereof.

Q 308?

A 308 and the reverse thereof is a carbon copy of a letter written to Mr. Clement Ehret by me. The original of this letter was signed and transmitted by U.S. mail to Mr. Clement Ehret and the copy has been in my possession since the date thereof.

Q Which is?

A This is April 6, 1940.

Q 309?

A 309 is a carbon copy of a letter written to Mr. J. B. Hayward, International Business Machines Corp., under date of April 22, 1941. The original of this letter was signed by me and transmitted to Mr. Hayward. This copy has been in my possession since the date thereof.

Q 310?

A 310 is the original of a letter written by Mr. J. B. Hayward to me under the date of April 24, 1941. I have had this letter in my possession since the approximate date thereof.

311 is a carbon copy of a letter written by me to Mr. Clement Ehret of the International Business Machines Corp. under the date of July 5, 1940, and the original of this letter was signed by me and

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transmitted to Mr. Clement Ehret by U.S. mail. This copy has been in my possession since the date thereof.

312 is a carbon copy of a letter written by me to Mr. Clement Ehret of International Business Machines Corporation under the date of July 5, 1940. The original of this letter was signed by me and transmitted to Mr. Clement Ehret by U.S. mail. This copy has been in my possession since the date thereof.

Q Might I ask you, Dr. Atanasoff, if you can tell by reference to the last paragraph of 312, if both it and 311 went forward in the same mail?

A It seems that they went forward together.

Q 313?

A 313 is the original of a letter written by the secretary to Mr. Clement Ehret to me under the date of July 8, 1940. This letter has been in my possession since the approximate date thereof.

Q Now, 313, the letter of July 8, 1940, to you from Mr. Ehret's secretary, speaks of receipt of letters of July 5 together with a pamphlet. You observe the reference?

A I do.

Q Your letter, Exhibit 311 in the fourth paragraph of the first page refers to a paper that, "I am enclosing"?

A Let's see. Where is this, 311, it's on 311?

Q 311, the fourth paragraph on the front page?

A Yes.

Q The sentence next to the last?

A Yes.

Q You observe the reference?

A I observe it.

Q What I wish to know is whether the pamphlet that is referred to as 313 and the "paper" referred to in 311 were one and the same thing?

A I believe they were.

Q I do not observe yet at least in the file, any copy of such paper or pamphlet?

A Yes. I can make a reasonable presumption as to what that material was if you wish?

Q Can you from your memory without indulging in presumptions, tell us your best recollection of what the paper was that you sent with Exhibit 311?

A It was either one of two papers. The one, the paper by Mr. Brandt and I on Analysis of Complex Spectra, or the further writings by me on the application of the IBM tabulator to the computation of the solutions for the simultaneous solution of linear equasions, -- the solution of simultaneous linear equasions, please: For the solution of simultaneous linear equasions.

Q And will your direct your attention to Exhibits 314 and 315 and see if you can identify them?

A Well, this is a letter written to me by Mr. Clement Ehret under the date of, this is, of July 15, 1940. This is the original letter itself. It was received by me at the approximate date thereof and has been in my possesssion ever since.

Q I ask you now to refer to the fourth paragraph of Exhibit 314, the letter of July 15, 1940, and see if that refreshes your memory as to the paper or pamphlet which you sent with Exhibit 311?

A Well, I did a whole lot here. Yes, it does, and it turns out that it was that pamphlet by Mr. Brandt and myself on the Application of Punched Card Equipment to the Analysis of Complex Spectra.

Q Will you identify Exhibit 316?

A 316 is a letter written by Mr. Clement Ehret to me. This is an original copy under the date of August 15, 1940. It has been in my possession since approximately that date.

Q Does 316 further refresh your memory as to the paper or pamphlet which you sent with Exhibit 311?

A It does.

Q Can you identify 317? And what I hope to do, and I hope you all will indulge me, is to finish Exhibit D-2 and then recess. Do you think you can bear with us that long, Dr. Atanasoff?

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A Yes. I am doing fine. And I don't blame you for wanting to get this over at all. I think if the rest of the gentlemen can stand listening to me drone for that length of time I certainly can.

Q Thank you. Will you identify if you can Exhibit 317?

A This is a letter and this is a carbon copy of a lette written by me to Mr. Clement Ehret under date of August 28, 1940. The original of this letter was signed by me and transmitted by U.S. mail to Mr. Ehret. This copy has been in my possession since the date thereof.

17/1/1/93
/S KL

Q Excuse me. Just to keep the record straight, 317 says you are sending a photograph. Do you find that reference?

A Yes.

Q 316, if you will turn back one number, you will observe asks for a photograph?

A It does.

Q And 314 on the second page identified as 315 asks in the first paragraph for a small photograph of yourself?

A It does.

Q Did you with Exhibit 317 send a photograph of yourself?

A With 317?

Q Yes, sir.

A It says I did. I believe I did.

Q All right. Can you identify 318?

A 318 is a letter written by Mr. Clement Ehret to me under date of August 28, 1940. This original document has been in my possession since the approximate date thereof.

Q 319?

A 319 is a carbon copy of a letter written by me to Mr. Clement Ehret, Director of Market Research, International Business Machines. The original of this letter was signed by me and transmitted by U. S. Mail to Mr. Clement Ehret. I have had this copy in my possession since the date thereof.

17/1/2/94

320 --

Q Excuse me. Did you state the date of 319, and if you did or didn't, state it anyway.

A December 14, 1940.

Q 1940. 320?

A 320 is the original of a letter written by Mr. Clement Ehret to me under date of January 16, 1942. I have had this document in my possession since the approximate date thereof.

Q 321?

A 321 is a carbon copy of a letter written by me to Mr. Clement Ehret under the date of January 22, 1942. The original of this letter was signed by me and transmitted by U. S. Mail to Mr. Clement Ehret.

Q 322?

A This copy has been in my possession since the date thereof. 322 is the original letter, is an original letter written by Mr. Clement Ehret to me under the date of January 27, 1942. It has been in my possession since the approximate date thereof.

Q 323?

A 323 is a carbon copy of a letter written by me -- wait a minute. 323 is a carbon copy of a letter written by me to Mr. Clement Ehret, Director Market Research of International Business Machines Corporation. The original of

17/1/3/95

this letter was signed by me and transmitted by U. S. Mail to Mr. Ehret. This carbon copy has been in my possession since the date thereof.

Q Which is --

A April 8th, 1942.

Q 324?

A 324 is the original copy of a letter written by Mr. Clement Ehret to me under the date May 14, 1942. I have had this letter in my possession since the approximate date thereof.

Q 325?

A This is the original of a letter written by Mr. Clement Ehret to me under the date of August 4, 1942. I have had this original letter in my possession since the approximate date thereof.

Q 326?

A 326 is a carbon copy of a letter written by me to Mr. Clement Ehret under the date of August 7, 1942. The original of this letter, of this carbon copy was signed by me and transmitted to Mr. Ehret by U. S. Mail. This copy has been in my possession since the date thereof.

Q 327?

A 327 is an original letter by Mr. Clement Ehret to me under the date of August 13, 1942. This letter has been in my possession since the approximate date thereof.

17/1/4/96

Q 328?

A This is an original letter written by Mr. Clement Ehret to me under the date December 21, 1942. This letter has been in my possession since the approximate date thereof.

Q Excuse me. On the back of 328 is a handwritten note. Is that in your hand?

A No.

Q Do you know whose hand that is in?

A I do not know, but it might be a secretary's. It might be Mr. Legvold's. Analysis would have to be made, but you see what happened, he directed this to Iowa State College, but on December 21, 1942, I was absent from Iowa State College and so it would have to be forwarded, and this note is relative to the forwarding of that letter to me.

Q Exhibit 530 -- excuse me --

A This is a letter --

Q Excuse me.

A This is an original letter.

Q Pardon me. Is the document which you have in your hand numbered in hand or with a machine?

A It is numbered in hand.

Q And the hand number is what?

A 530.

Q Is the machine number such that it can be read?

A Yes, but it seems as if it's 5530.

Q Then is that obscured or stricken out in some fashion?

A It is stricken out.

Q So is it proper to call this Exhibit 530?

A I believe it is.

Q All right. Identify it, please.

A We can look at our, if you will allow me to use your material there, I can attempt to ascertain whether this is the correct number 530 because we have documents interrelating to these and this can be checked, but for the time being, this is an original letter written by Mr. A. J. Etienne of the patent department of International Business Machines Corporation to me under the date of June 21, 1954. This letter has been in my possession since approximately the date thereof.

MR. HALLADAY: All right. Is everyone agreeable to recessing now, and we will reconvene at 9:15.

(Whereupon an adjournment was taken until 9:15 o'clock A.M., November 14, 1968.

E-1-1

VOLUME IV

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

- -x

Honeywell, Inc.,

Plaintiff,

-vs- 4-67 Civ. 138

Sperry Rand Corporation and Illinois Scientific Developments, Inc.,

Defendants.

- -x

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 9:15 o'clock A.M., November 14, 1968.

(Appearances as heretofore noted.)

November 14, 1968
9;15 o'clock A.M.

MR. HALLADAY: I have now brought here reproductions of two volumes which I had earlier referred to that were sent from the Iowa State library and for which we had reserved exhibit letters and I would like to have the reporter mark them according to those reserved exhibit letters. The first is Atanasoff Deposition Exhibit Q, the so-calle Master's thesis of George Lloyd Gross, and we have put on the cover of the document that we intend to have marked in typing the title that appears on the spine of the bound volume. Internally we have reproduced by Xerox process and have a copy for counsel of that reproduction.

(Atanasoff Deposition Exhibit Q marked for identification.)

MR. HALLADAY: I would also like to have marked as Exhibit R the George L. Gross Ph.D. thesis which we have reproduced by Xerox process. On the cover of the document to be marked we have had typed George L. Gross thesis, 1939, which reproduces the title appearing on the spine of the bound volume which we had sent up here from the Iowa State library.

(Atanasoff Deposition Exhibit R marked for identification.)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (CONTINUED)

MR. HALLADAY: We will ask the reporter to retain Exhibits Q and R as original exhibits in lieu of the bound volumes which I will return in due course to the Iowa State library.

BY MR. HALLADAY:

Q Dr. Atanasoff, before convening and at my suggestion you brought back your original file?

A I have.

Q Have you also taken from that file Exhibit D-3?

A I have.

Q Do you have that before you?

A I have.

Q Now, yesterday in connection with the examination of you pertaining to Exhibits D-1 and D-2, we had developed a sort of a pattern of conduct in identification of documents which resulted in some part, at least, from more expedient methods of communication than had originally been the case in identifying documents. I think I made a fair

statement, have I not?

A You have.

Q What I would like to do in an effort to expedite the proceedings as much as possible and with some exceptions, to make an effort to have identification of documents hereafter follow an even more general pattern, therefore, I would like to ask you this question. Do you have before you Exhibit D-3?

A I do.

Q And is it correct that included in Exhibit D-3 are subnumbered documents 329, 330, numbered by machine, two documents numbered 330 in hand numbering and documents numbered 331, 332 and 333 by a machine numbering device?

A I have it.

Q With respect to the documents included in Exhibit D-3 which are machine numbered, is it fair to say that according to the context of each, they were either written or received on or about the date which each bears?

A They were.

Q To the extent that there are carbon copies included inExhibit D-3,your original file, such represented carbon copies of letters of your authorship, did they, the originals of which were signed by you and posted according to the practice you have described in reference to other similar exhibits previously?

A They were.

Q And in each instance either the carbon or the original, as the case may have been, has beenin your possession since the approximate date which each respectively bears?

A They were.

Q Now, just because of some peculiarities in this particular Exhibit D-3, would you turn your attention to Exhibit 330 which is marked by machine and two documents which have the same number on them marked in hand. Do you

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have those three before you all at once?

A I do.

Q Addressing your attention to document 330 marked in hand which appears to be a letterhead, in that particular instance, is that the original?

A It is.

Q And then the next one which is marked in hand 330, does that appear to be a typed copy of the letter also marked in hand 330, an original?

A It does.

Q Is it a carbon copy of the ribbon original?

A It appears to be. I believe it is.

Q Do you now know whether or not the document that is marked in hand 330 on the letterhead of Remington Rand, Inc. came to you in duplicate?

A Well, one must assume it did. I don't remember the incident.

Q All right. Then the next document in the file machine marked 330 has in the upper right-hand corner handwriting, do you see that?

A I do.

Q And is the handwriting a date?

A I do.

Q Is it in your hand?

A It is in my hand according to my custom and

of recent origin.

Q Of recent origin?

A Or recent origin.

Q All right. Is there also a question mark there?

A What's that?

Q Is there a question mark on the machine numbered 330?

A Yes. You see there was some instance when I didn't have the others at hand when I was looking at it and when I put the question mark to be sure I would verify it, but that is all.

Q Will you now look at Exhibit D-4, please. One other question, Dr. Atanasoff, I find another illustration, on the suggestion of Mr. Allegretti, that in Exhibit D-3 on document 329 --

A Right.

Q -- a handwritten correction in the third line where it looks like the word "appy," has been corrected to be "apply," in hand?

A Right.

Q And in the next to the last line of the letter a handwritten interlineation?

A The handwritten interlineation is mine. The other one I cannot swear to but I believe it is also mine.

Q And again, as to such interlineations your answer

that, well, what is your answer as to whether those interlineations were on the original?

A It is my opinion that they were on the original according to my standard custom of the day.

Q Will you turn now, please, to Exhibit D-4. Now, with respect to that, I will ask you the questions this way. Are letters included in that Exhibit D-4 which appear on original letterhead and which were addressed to you, received by you on or about the date which each bears?

A They were.

Q And with respect to carbon copies appearing in your file over your name, were each of such carbon copies handled by you in the fashion you have heretofore described with respect to other exhibits of like kind?

A They were.

Q In each instance, have the documents included in Exhibit D-4 been in your possession respectively since approximately the date which each respectively bears?

A They have. I wish to make a query here.

Q Proceed.

A Now, you see I swore to something false. I corrected it in this other list here. You know it's very evident that this one sheet there that is more recent origin in some way, except for that.

Q Let's go back then.

A You remember the one?

Q In Exhibit D-3?

A Yes. You remember the one I labeled myself?

Q All right.

A I want to be careful not to do that, as carefully as I can be. I believe this is of recent origin, and I so stated, but I mean we will have to be kind of careful that I don't slip on things like that, and I may take a little deliberation at times to be sure I do not.

Q All right. You are referring now to Exhibit 330 machine stamped which is included in Exhibit D-3, are you?

A Which does not have an address.

Q I beg your pardon?

A Which does not have a date except a handwritten date.

Q That's the handwritten date, you will say now that the document included included in Exhibit D-3 machine stamped 330 is of recent origin?

A I am. I am not able to declare that it is not of recent origin, I know the date applied at the top is of recent origin, that I know.

Q In any event, it is typed copy of a document?

A It is. Yes.

Q That was received at an earlier date as you have identified it?

A Yes.

Q All right. And you are saying therefore that you wish to check these files from time to time as we refer to them, to see if there is anything of that sort?

A I am going to be very busy doing so, sir.

Q All right. Would you go through Exhibit D-4 then and see if there are any of the category which require special comment of the character you have just stated?

A I have no comment.

MR. HALLADAY: Off the record.

(Discussion off the record.)

BY MR. HALLADAY:

Q Dr. Atanasoff, referring to Exhibit D-4, is it correct that there are the following numbers contained therein, namely, 540 through 558 inclusive?

A There are.

Q Directing your attention to Exhibit 545, a letter dated July 22, 1940, there is a handwritten note in the left-hand margin of that document. In whose hand is that?

A That is in my hand.

Q When was that put on Exhibit 545?

A As of approximately the date thereof.

Q And was that a then contemporaneous memorandum of fact?

A It was.

Q Will you turn now to Exhibit E-2, please. Do you have it before you?

A I do.

Q Can you describe for the record in general the contents of Exhibit D-4? I am looking for a sort of a subject matter classification, please?

A That is referenced -- E-2 is --

Q Did I say D-4?

MR. ALLEGRETTI: Yes.

BY MR. HALLADAY:

Q I meant E-2, of course. That's what you have before you, is it not?

A It is. It is. And reference E-2 is entitled Iowa State Research Foundation and it represents a lot of negotiations and back and forth relationships concerning my legal relationship with this entity called the Iowa State College Research Foundation.

Q Are the documents contained in Exhibit D-4 -- E-2 consecutively numbered from 385 to 404?

A Yes. Except that there is a variation of pattern and sometimes a single number is used on a thing fastened together and some different from the usual custom. I don't attach much importance to those cases, but that is the only exception to that rule.

Q Now, were each of the documents included in your

original file folder Exhibit E-2 either made by you or received by you, as the case may be, on or about the date which each bears?

A They were.

Q And has each of the documents been in your possession since on or about such date?

A They have.

Q And, again, with respect to documents of your authorship which appear to be carbon copies, was the same routine followed as you have heretofore stated was followed in the creation of other similar correspondence type of documents?

A It was.

Q And is the situation the same with respect to original correspondence addressed to you as you have heretofore described with respect to similar documents previously identified?

A It was.

Q Would you direct your attention to Exhibits 389 and 390?

A Right.

Q Included in Exhibit 2?

A I do.

Q Do you observe there is what appears to be a machine numbered 389 and 390, the first 389 so numbered being

on the letterhead and there is also a hand numbered 389 and 390 on blank sheets of paper, thatis to say, no letterhead or identification?

A That is true.

Q May I ask whether or not the hand numbered 389 and 390 in your file appear as carbon copies of the machine numbered 389, 390?

A They do.

Q Would you look, please, at number 395?

A I am.

Q Is that an executed original document bearing your signature and that of Charles E. Friley, president?

A It is.

Q As well as that of Wallace E. Barron?

A It is.

Q And would you also look at No. 399, please?

A I am.

Q Is that in the handwriting of the person whose name appears at the end on the page numbered 400?

A I believe so.

Q There is some handwriting at the top of Exhibit 399 immediately near a receipt stamp. Do you observe that handwriting?

A I do.

Q Do you know whose that is?

A I believe that is in the handwriting of Jean Berry. I am not 100 percent sure, but I think so.

Q Do you know now of your own recollection whether as of October 16, 1941, Jean, your secretary, had become Jean Berry, Jean Reid, that is to say, had become Jean Berry?

A I do not -- I do not recollect clearly the date of that event. I was present but I don't recollect the date of it.

Q Did I say her name correctly, was it --

A Jean Reid, R-e-i-d, I believe.

Q And then she married, as you have said, Clifford Berry and became Jean Berry?

A Right.

Q Whether that event had occurred by October, 1941, your memory doesn't tell you now?

A It does not.

Q Would you now skip over the F identification and turn to the G file, please?

A G?

Q G-1, please.

A Right.

Q Now, that is, Exhibit G-1 which has the label on it of what?

A "Condensers."

Q Can you describe for our purposes of understanding which in the main is the content of Exhibit G-1?

A G-1 is a repository for correspondence, pamphlets, and test results on condensers relative to their use in the computing machine of this period.

Q And will you see whether or not Exhibit G-1 includes consecutive numbers 600 through 628?

A 628 did you say?

11/14/68
WS#2
2/1/1/1
KL

Q Yes, sir.

MR. DODDS: I might indicate our files seem to include no 627.

THE WITNESS: Six what?

MR. DODDS: 627.

THE WITNESS: Six and seven?

MR. DODDS: 627.

BY MR. HALLADAY:

Q Will you check to see if there is a 627 in the original file?

A Here it is.

MR. HALLADAY: Here is one --

MR. DODDS: Thank you. Wait a minute. I am sorry. This was upside down.

BY MR. HALLADAY:

Q Is there a 613 in the original file, Dr. Atanasoff?

A What?

Q 613?

A There is.

Q Then with reference to the documents included in Exhibit G-1, to the extent that the same appear to be carbon copies of letters over your name, were those carbon copies created on the dates under circumstances and were the originals handled in the fashion of original correspondence according to the descriptions you have heretofore given with respect to

2/1/2/2/

similarly created documents?

A They were. I would like to append a further statement

Q Proceed.

A You will remember that -- it just occurred to me that my practice was to send letters by U. S. Mail and that was followed in all instances, except when the parties were on the campus of Iowa State College, when they were sent by campus mail. I wish the record to show that that was the case and that that was our practice of the day and was concisely for the present purposes.

Q So then, if an addressee either in Exhibit G-1 or elsewhere is located on the Iowa State Campus at Ames, Iowa, would it be true that either U. S. Mail or campus mail would have been used?

A Almost invariably the latter in such cases.

Q And campus mail, was that something that was routinely afforded to faculty members and others for communication purposes on the campus?

A It was.

Q Was it an official activity established by Iowa State?

A It was.

Q And with respect to any documents that may appear in Exhibit G-1 in the form of communications to you, were those,

2/1/3/3

again, originals received by you through the mail, either U.S. or campus as the case may be, if applicable, and in the manner and under the circumstances you have heretofore employed in describing similar communications in other exhibits?

A They were.

Q And in each instance, have the documents so described and retained by you been in your possession since the respective dates?

A They have.

Q Putting your attention, if you would, please, to Exhibit 600 in Exhibit G-1, the very first one, Dr. Atanasoff,

A Right.

Q Does that exhibit appear to be similar to an earlier one which was looked at, on the back of which, that is to say, the side not bearing the number, there appears to be employment of paper, one side of the paper for scratch paper purposes

A It does.

Q On the side which has the number 600, in whose hand is the writing?

A That side is my hand.

Q Can you fix the date thereof?

A The date thereof was in the early part of 1940.

Q And can you, without stating the substance, state the purport of the handwriting that you have put on Exhibit 600 What does it reflect?

2/1/4/4

A It reflects tests upon various condensers.

Q And are the identities of the condensers listed in your hand on Exhibit 600?

A They are so listed.

Q And the results of the tests?

A They are.

Q And at the top of Exhibit 600 is a legend. Does that state the character of or results sought by the test?

A Yes. I would rather say it sets the conditions of the test.

Q What were those conditions?

A The time in seconds necessary for a charge on these condensers to fall to one-half their original value, the charge and the voltage to fall to one-half of their original value.

Q Do these notations as made by you on Exhibit 600 represent tests made by you or by somebody else at the period of time you have stated?

A Maybe somebody else helped me, but I was right near.

Q What were you doing to do these tests?

A Do you want me to describe the tests?

Q Would you please?

A Yes. It was very simple. We just took a condenser and touched it with a terminal of a B battery so it became charged to more or less a fixed voltage, and then we, with a stop watch we timed the time necessary for the charge to fall

2/1/5/5

to one-half of its original value, or the potential to fall to one-half of its original potential, more accurately, and then we took that time and entered it herein. And you see there the time in seconds to fall to one-half. We have some poor condensers but we have some very good ones there. Number 5, a Solar condenser was doing us rather badly. It was a leaky condenser. But, you know, you have a little difficulty excluding local conditions of tests, and after we had selected condensers and uniformized the conditions of test, the results got to be very good.

Q Dr. Atanasoff, also included in Exhibit G-1, are some carbon copies of correspondence that bear the name Clifford Berry, Research Assistant -- Research Fellow, excuse me. Were those letters sent out by Mr. Berry under your supervision?

A They were.

Q And as to those carbon copies, do you know whether or not they were handled in fashion like carbon copies of letters that you yourself personally handled?

A I have no reason to suppose they were not.

Q And as to those, have those carbon copies been in your files since the respective dates?

A They have. This file was used cooperatively by both of us.

Q If you will look at Exhibit 617, please.

A I do.

2/1/6/6

Q And would you look at the back of it? There is nothing on the back. Excuse me. I am looking for a hand-written page that is very near 617.

A Oh, yes.

Q Excuse me, the back of 618.

A 618 has some, yes.

Q Whose handwriting is on the reverse side of Exhibit 618, please?

A It is my handwriting. I can tell you what the subject of that running was.

Q Will you do so?

A You notice on the front -- I remember it very well -- you notice on the front he is talking about filling, about potting these condensers. Now, in order to get a compact unit, one of which remains at Iowa State University to this very day, so that there will be a lot of condensers in a small amount of space, we decided to buy the unpotted condenser components and pot them. We corresponded with a lot of condenser manufacturers and they all told us that we couldn't do that, that we had to buy their original potted condensers, except John E. Fast, and John E. Fast told us, as is recorded in 617 and 618, that we could pot them ourselves without danger, and they offered to sell us potting wax, and on the back of 618 I am calculating the cost of the potting wax.

Q All right. On the back of Exhibit 619 there is

2/1/7/7

some marking. Would you look at it, please?

A Yes.

Q How would you characterize that?

A I do not know.

Q Do you know whose markings those are?

A I have no doubt they are mine, and I can't decipher them.

Q Then -- excuse me. Would you turn to the pamphlet in Exhibit G-1 which is orange in color and headed "Mallory Dry Electrolytic Capacitors"?

A Yes, sir.

Q Just the cover. Is the first sheet of that, inside the cover, number 628?

A It is.

Q Do you observe there is no numbering on the cover itself?

A Yes, that is right.

Q Does the cover, which has no number, bear your signature?

A It does.

Q Has this document been in your possession since it was received?

A It has.

Q And do you now recall approximately when it was received?

2/8/8

A I would say during the year, well, approximately the year of 1940, although it could have been '41.

Q I observe on the second sheet of the pamphlet a legend, "Second Edition, November, 1939," with the copyright in that same year. Does that assist you in any way in saying when you received this particular second edition?

A It confirms my feeling that my estimate was correct.

Q Which was what?

A In 1940 or possibly 1941. You see, this is November, 1939, so 1940 looks more likely, but possibly '41. They might have kept an edition around that long, but I am using other material than this record here in estimating that. I am using my memory of when I received this.

Q All right. Will you turn to G-2, please? Do you have it before you?

A I do.

Q Does that have documents serially numbered from 700 to 718?

A It does.

Q As to the documents contained in Exhibit G-2, which appear to be carbon copies of correspondence over your name, were those items of correspondence handled as you have heretofore described with respect to similar correspondence items?

A They have. They were.

2/9/9

Q As to the items in Exhibit G-2 which appear to be originals of correspondence addressed to you, were they handled in such instances as you have described similar original correspondence heretofore?

A They were.

Q And as to each of the documents bearing a date contained in Exhibit G-2, has each thereof been in your possession approximately the date which each respectively bears?

A They have.

Q And what, in general, is the purport of the file Exhibit G-2?

A The file labeled G-2 is a repository for correspondence on resistors and material received on resistors. I do not remember any tests recorded herein but there may have been because we made tests on resistors. Resistors in those days was not as the standard item that they are today and the reliability of them was open to question, and this -- these communications and this material was used to determine that the resistors which would be used would be of suitable quality.

Q On the reverse -- excuse me -- On the face of Exhibit 706 are some handwritten figures at the foot. Do you know whose handwriting that is?

A That is in my handwriting.

Q What is it?

2-10/10

A What is it about?

Q Well --

A It's a multiplication of 34 by 20, giving 680, but I don't remember the purpose.

Q On the reverse of Exhibit 706 is also a notation and some initials. By whom was the notation made and whose initials are they?

A Those are my initials and the notation was made in my hand.

Q There are some numbers also written thereon. Do you recognize who wrote those numbers?

A Yes. I believe I did.

Q Do you have a recollection of who it was that you wanted to look this over, referring to 706?

A Probably Clifford Berry, but I am not sure.

Q Would you look at No. 717 and tell us, if you can, the date upon which, approximately, you received that exhibit?

A It was received approximately the year 1940. I believe it was received during 1940. I know we considered the S. S. White Manufacturing Company resistors at that time.

Q And will you look at Exhibit 718 which bears date, effective March 15, 1939, and tell us, if you can, approximately when you received Exhibit 718?

A I would state during the year of 1940.

Q Has each of the documents contained in Exhibit G-2

2/11/11

been in your possession since they were, since the dates upon which each was respectively received?

A They have.

Q Will you turn to Exhibit G-3, please? Have you it before you?

A I do.

Q Does it contain documents serially numbered consecutively from 800 to 821, inclusive?

A It does.

Q With respect to the documents included in folder Exhibit G-3, to the extent that the same appear to be carbon copies of letters over your name, were such carbon copies handled and the originals dealt with as in the case of other similar carbon copies about which you have heretofore testified?

A They were so handled.

Q To the extent that the documents included in Exhibit G-3 consist of original letters addressed to you, were the same in each instance received by you under the circumstances that you have heretofore used in describing similar correspondence?

A They were.

Q Have the documents in Exhibit G-3, consisting of correspondence or carbon copies of correspondence, respectively, been in your possession since their respective dates?

A They have.

2/12/12

Q I direct your attention to Exhibit 800, the first item in Exhibit G-3, please. What does that appear to be?

A This is a calculation -- I mean, that is, that contains penciled notation in my hand. It consists of enumeration of the vacuum tubes required for the machine at one stage of thought. It suggests that we write Bowie and request information about supply of these tubes and price thereof.

Q And is this in your hand?

A It is in my hand.

Q On a yellow sheet of scratch paper?

A Yes.

Q And who is the Bowie therein referred to?

A The Bowie refers to Dr. R. M. Bowie, formerly a vice-president of Sylvania and later of the General Telephone.

Q Had you known Mr. Bowie at this time?

A I have known Mr. Bowie continuously and somewhat closely at times since the year 1926 or '27.

Q Document No. 801, in whose hand is that?

A That is in my hand.

Q Is that on some kind of scratch paper or what?

A Well, it's on a sheet of white paper, but it is scratchy enough, all right.

Q Is all of it in your hand?

A Every item there is in my hand.

2/13/13

Q There is an apparent diagram at the top of that sheet?

A Yes, sir.

Q Can you state the character of that diagram?

A That diagram represents an item in the structure of the computing machine.

Q What item?

A Well, the upper drawing relates to the brush assembly bearing upon the rotating contacts in the drum, which we will hereinafter designate as KA, and which is provided with three brushes, so that cycling of contents can take place on that drum.

Q On the right-hand side of that upper sketch is a circle?

A Yes.

Q Roughly drawn circle, at least. What does that purport to represent?

A I suppose those two upper circles were intended to represent vacuum tube, but one didn't get its inner works drawn in.

Q The lower of the two circles, is that a schematic representation of something, according to any kind of convention?

A Yes, that is a schematic representation of vacuum tube, but it, also, is incomplete.

2/14/14

Q Then there are a list of numbers and letters below. To what do those letters and numbers refer?

A They refer to the numbers of certain then current vacuum tubes.

Q To the right of certain of the numbers and letters on Exhibit 801 is another drawing or sketch. Can you state what the purport of that is?

A I believe that this related to some alternative scheme for shifting the register, but I am less certain about the original meaning of that diagram.

Q Can you fix the approximate date of Exhibit 801?

A Well, it certainly was in the year 1940 or '41.

Q On Exhibit 802, next to the address in the left-hand column there is some red written on the original. Whose writing is that?

A That is in my handwriting.

Q The wording is obscure on the copy I am working with. Is it legible on the original?

A It is. It says, "Tax pd., 15¢."

Q On Exhibit 808, a letter of January 18, 1940, first page, there is a numeral sign and some numbers near the address. Do you recognize that hand?

A That is in my hand.

Q Are you able to interpret the significance of that entry?

2/15/15

A I am not.

Q And with reference to Exhibit 811, which has handwriting on both the front and reverse, was that handwriting on that exhibit when you received it?

A It was.

Q The same question as to Exhibit 814?

A The same answer.

Q Now, on Exhibit 821, there appear to be some markings of what look like chemical apparatus of one kind or another. Do those have anything to do with the contents of the letter?

A They do not.

Q Do you know who put them on this document?

A I am embarrassed to say that I did. I even remember doing it. I will be blessed if I know why,, but I do.

Q Did you have some kind of a device that you were employing?

A Well, what happened was that just at this moment there came to my desk a template, and you know, templates were discovered in that day. They hadn't existed previously, just didn't have them, so I just scratched away on this copy. I don't know why.

E31

Q Has each of the documents included in Exhibit G-3 been in your possession since their respective dates?

A They have.

Q Have you Exhibit G-4 at hand, Dr. Atanasoff?

A I do.

Q Does this exhibit contain documents serially numbered from900 through 914 inclusive?

A From 900 to 914 is marked.

Q To the extent that Exhibit G-4 contains carbon copies of letters over your name, were such carbon copies handled in the fashion and the originals thereof also in the fashion you have heretofore described with respect to similar items of correspondence?

A They have, and I again state that certain of these items were handled through the University mail, not through the U.S. postal system.

Q As an illustration, would you look at No. 906. Would that be such an example?

A That would be such an example.

Q And with respect to documents included in Exhibit G-4 which appear to be original letters addressed to you, were those respective handled in the fashion you have heretofore described with reference to similar original correspondence of your receipt?

A They were.

2

Q And has each of the documents been in your possession since approximately the date which each respectively bears?

A They have.

Q On exhibit 900, the first document in Exhibit G-4, do you have that before you?

A I do.

Q There are certain notations in hand. Do you know the hand?

A The hand is that of mine.

Q Are you capable of interpreting the meaning of that handwriting on Exhibit 900 at this time?

A A little of it. That half hard refers to half hard brass. We are using some brass and it was half hard, I remember. The rest of it I cannot remember.

Q With respect to document 912, to what does that and its fellow 913, relate?

A Well, document 911 and document 910, I have asked about rotor and stator punchings. In document 911 I got a reply that they had some punchings available, some stock of rotor punchings. In 912 and 913 they have enclosed drawings, representative drawings of such punchings, first the rotor punchings in 912 and the stator punchings in 913. I will conclude with that.

Q Would you now turn to Exhibit H-1, please?

A I would make one more remark on item No. 914 of the previous file which somebody was asking about yesterday and could not find. There it is.

Q In any event, it appears to have been reproduced in the copy I have been working with.

MR. HALLADAY: Mr. Dodds, do you have a 914 in your file?

MR. DODDS: Yes.

MR. HALLADAY: All right. Thank you, Dr. Atanasoff. It's 10;25, would you like the morning break, Doctor?

THE WITNESS: Fine.

(Recess taken.)

BY MR. HALLADAY:

Q Dr. Atanasoff, earlier you have testified some about receiving a grant from the Iowa State College Research Foundation or some similar name, and --

A Correction, research council, I believe.

Q All right. Whatever the exact name was, and all I am doing now is to give you a background for some questions that I am going to get to. Also earlier you have referred to documents pertaining to an effort to obtain some kind of a grant from CSAL, Committee on Scientific Aids to Learning, and correspondence between yourself and Mr. Poillon of Research Corporation also pertaining to a

grant. It's in this area of financial matters that I am going to address some questions to you. While you were at Iowa State in the years 1939, 1940 and 1941 and '42, as a recipient of or participant in activities pertaining to a grant, was it then the custom for Iowa State to assign some kind of a project number or identification to such activities?

A It was.

Q Do you now recall so that you can tell without referring to any documents, what the various project numbers were which were assigned to the work of the sort that you have been testifying about here?

A What comes to mind is 35 and 42 as project numbers at various times. I am not sure these were the only ones that I was the recipient of.

Q And starting in 1939, were you the recipient of, and when I say were you the recipient, I don't mean you personally, but were you a participant in work that received some kind of a grant and aid in 1939?

A Yes. At first these grants were from Iowa State University. Subsequently they were monies which were received from research corporations as you have outlined.

Q When you first engaged in work subject to such a grant in 1939, did it then have in 1939 a project number?

A I am sure it did.

Q While you worked on that project in 1939, can you describe for the Court how the financial arrangements were handled in respect to keeping records?

A Well, it is almost as if, that I had an account. I did have an account in this central business office of Iowa State College as it was at that day, and so I could not order anything directly. I had to direct a request for the purchase of an item to the central business office, and they paid for these items, and the item in question came to me, and I checked it and okayed the vouchers on these items, and this is a method which would be used in any business today, more or less like a method that would be used in any business today for this purpose, except that, of course, it was entirely in those days a hand kept operation, and it was also accompanied by the process which is common in today's business, the financial manager giving the man down at the other end hell for the way he handles the business, and you will find among the letters that have passed before me today some such hell giving letter.

Q Then while you were engaged in the process of operating under one or another of these grants in the years 1939, '40, '41 and '42, how mechanically were you kept apprised of the bookkeeping that was going on?

A Well, I was sent statements. I was sent invoices or vouchers and then statements. Now, the exact

classification of these I don't want to say, but I received statements at regular intervals and these statements showed the condition that my account was in.

Q Directing your attention to Atanasoff Deposition Exhibit H-1, can you describe, without detail, the purport and the contents of that exhibit?

A Well, you can pick up -- it refers to item 1000 here, and this is a department budget statement, and attached to it we have, we have had -- we have attempted to attach the intermural vouchers relative to this item, I believe in certain cases the intermural vouchers are absent or not at hand through some inadvertence or the intermural vouchers may, due to some complications, be -- refer to more than one budget statement or a budget statement, of course, if it's a budget statement of more than one voucher, both vouchers are attached. We made an effort, I, independently of anyone else, made an effort to get these things in order and the order isn't very good yet, but we have done a good deal to the order of these documents.

KL=16
/2/1/16
EA

Q Now, with respect to Exhibit H-1, is it correct that, subject to human error, it contains documents serially numbered from 1,000 to 1224 inclusive?

A Well, I couldn't tell you for sure, but apparently that is true. Yes. That is apparently true.

Q When I say serially numbered from 1,000 to 1224, are those serial numbers machine stamped on the documents in question?

A It was our intention to serially mark them, but you may find a bad mark enhanced by a pen and you may find an error in the stamping which caused us to make a pen correction. Otherwise they are machine stamped.

Q And have you throughout Exhibit H-1 attempted to serially number the documents in such a fashion that one can detect the serially numbering imposed by you to distinguish it from serial numbers that were on the documents at the time of their receipt?

A I believe in every case it will be easy to distinguish whether the number was added by me or whether it was added -- whether it was an original number on the document.

Q Were these documents now numbered from 1,000 to 1224 received by you respectively on or about the dates which each bear?

A They were.

Q Were they received by you in your capacity -- in

3/2/2/17

some kind of a capacity in connection with the project?

A Yes, sir. As project engineer.

Q Now, I observe on the first sheet number 1,000 a reference to project 41?

A Right.

Q What was that project?

A That was a project that referred to the work on and the building of the computing machine.

Q What date does that commence with according to the Exhibit 1,000?

A Well, I see here September 25 which was probably in '39, given there.

Q Is there a year date reference?

A But on the --

Q Excuse me, Dr. Atanasoff. Is there a year date reference on Exhibit 1,000 at the head of the column?

A Yes. It says '39-40 there.

Q And then do the succeeding exhibits bear month and year dates?

A Month, day and year.

Q Your answer is affirmative?

A I corrected that slightly. I said month, day and year.

Q And have you attempted to rearrange your original file now so that it flows from 1,000 to 1224 in numerical

1/2/3/18

order?

A Yes. There was -- the mixup was only locally here and I believe it has been corrected in all detail.

MR. HALLADAY: I think, Mr. Dodds, in the reassembly process that the copies which you have as well as those which I have had in part gotten out of order, and I think you will find that in your file No. 1152 -- do you find 1152?

MR. DODDS: Yes.

MR. HALLADAY: Then hold that one firmly and proceed from there to the sheet marked 1220, you will have a batch that you can take out in batch and simply insert it at the rear of the rest of them as I am doing here. I think if you do that, and my own gyrations have been correct, the first group paper-clipped together in the duplicate copies correspond to the first group paper-clipped together in the original.

BY MR. HALLADAY:

Q And follow me, Dr. Atanasoff?

A I will.

Q The first set paper-clipped together in the original appears to bear numbers 1,000 through 1,003 inclusive?

A Right.

Q The next set clipped together, 1,004 through 1006 inclusive, is that in conformity with the original?

3/2/4/19

A It is.

Q And the next one 1,007 through 1,011 -- excuse me, 1,012 inclusive?

A Correct.

Q And the next 1,013 -- 1,014?

A Correct. Wait a minute, 1,015 that group was, that last group.

Q Then the next group is from what number to what number grouped as they are in your file?

A 1,016 to 1,021.

Q The next grouping?

A 1,022 to 1,025.

Q Next?

A 1,026 --

MR. DODDS: Just one second, please. Okay.

THE WITNESS: 1,026 and 1,027. The next group --

BY MR. HALLADAY:

Q Excuse me.

A 1,000 --

Q Excuse me. Thank you. Next grouping, please?

A The next grouping 1,028 alone. Next 1,029 alone. Next 1,030 alone, 1,031 alone. The next group is 1,032 through 1,035. The next one 1,036 through 1,039. The next

3/2/5/20

group 1,040 to 1,044. The next group 1,045 - 1,052. The next group 1,053 - 1,063. The next group one thousand --

Q Excuse me. Proceed, please?

A 1,064 to 1,087 and there is included in this also a handwritten 1,086A in this group which will be recorded by the court reporter. 1,088 --

MR. DODDS: Excuse me.

THE WITNESS: 1,088 --

MR. DODDS: Excuse me. I don't have 1073.

MR. HALLADAY: Excuse me just a second.

THE WITNESS: 1,073, have you discovered it?

MR. DODDS: No.

THE WITNESS: I have it. And it is -- it's one of those little ones. It's the last one of those.

MR. HALLADAY: May I see 1,086A?

THE WITNESS: 1,086A, you are welcome to take it, but I don't think -- Well, I don't know what you are talking about for sure.

(Discussion off the record.)

MR. DODDS: I don't have 186B --

MR. HALLADAY: It's 1086.

THE WITNESS: 1086.

MR. HALLADAY: A.

MR. DODDS: I don't have that. Maybe I have it. It isn't identified. Okay. 1073 we still don't have.

MR. HALLADAY: 1073?

MR. DODDS: 1073.

W-4

(Discussion off the record.)

BY MR. HALLADAY:

Q All right, Dr. Atanasoff, back on the record, what is the next group in your original file by exhibit serial number, please?

A The next grouping is 1088, beginning at 1088 and going to 1091. The next grouping is 1092, going to 1097, I believe. My files are kind of messed up. I am having a little difficulty here, so I will have to check it a little bit.

Q For our purposes, I think it is enough if you state as they are now. They we will --

A The trouble is somebody scrambled up the files and I am having a little difficulty here.

Q I understand that.

A It means the items in here are scrambled, so I am likely to misquote the range.

Q I understand that, but my point was, as long as they are physically put together this way as they presently are, let's leave them that way. If there is some need to separate for discussion purposes, we can do that and we will know then how the file is and we will know that the duplicate correspondence to the file as it is now. Do you see what I am saying?

A I read you loud and clear. 1092 to 1097.

1098 to 1105. 1106 to 1111.

Q Go ahead, please.

A 1112 to 1116. I am sorry, the state of my files is just such that I am going to have to reshuffle them to get the first and last of the grouping.

Q All right, sir.

A 1118 --

MR. DODDS: Do you have 1117?

THE WITNESS: It should be 1117 but it's not. Does somebody else have 1117? I do not have it.

BY MR. HALLADAY:

Q Let's note the original file apparently does not have 1117, at least in place at the moment.

A 1117 is now discovered. It's back in the previous file, back mixed in with the previous papers.

Q So the next grouping --

A So now we are ready with 1117 standing alone, and then 1118 to 1121. Then 1122 to 1128. Then 1129 --

Q Excuse me one moment. Excuse me, Dr. Atanasoff. May I see the original just a moment?

A Which original, this one?

Q The serial number including 1122 to 1128.

MR. DODDS: Off the record.

(Discussion off the record.)

3

THE WITNESS: 1129.

BY MR. HALLADAY:

Q Just a moment, please, Doctor. You have 1122 -- excuse me --

A Do you want me to repeat this one?

Q Do you have 1122 through 1128?

A Through 1128, I do.

Q Next?

A 1129 through 1134.

Q Just a moment. Bear with me. 1129, 1130 --

A There is 1128 in here that is out of order.

Q Excuse me. You mean you have marked --

A It's 1028.

Q You have marked it 1028-A, --

A I think if you will go back to the set next before, that should be numbered 1128-A. Instead of 1028-A, it should be 1128-A.

Q I think that is a clerical error of some kind.

A I will look at 1028 and see if this one that is numbered 1028-A -- yes. May we correct the number on this one item?

MR. HALLADAY: It is agreeable with me.

MR. DODDS: Agreeable.

THE WITNESS: Because it belongs as

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1128-A instead of 1028-A as marked. It was marked by us in error.

BY MR. HALLADAY:

Q All right.

A Shall we correct it, all by agreement?

MR. DODDS: Yes.

MR. HALLADAY: Yes, please.

THE WITNESS: I now correct 1028-A, making it 1128-A, and attaching it to the previous group.

BY MR. HALLADAY:

Q Then with that correction, does the current grouping before you include 1129 through 1132?

A Let me check. It goes through 1134. The next grouping --

Q Thank you. The next grouping, please?

A 1135 through 1151. The next grouping --

MR. DODDS: Just one second, please. I don't have 1136.

THE WITNESS: 1136 is here.

MR. HALLADAY: I think that is another one that is in the copying process and has gotten out of place. It's not in ours, either.

THE WITNESS: It is here. It is $4.17. I don't know what it's for, but it is in order.

BY MR. HALLADAY:

Q All right. Excuse me.

MR. HALLADAY: Off the record.

(Discussion off the record.)

THE WITNESS: The next group is 1152 to 1158.

MR. DODDS: 58, you say?

THE WITNESS: Yes, 1158, according to my notation. Do you agree?

MR. DODDS: Just a second. Okay.

THE WITNESS: 1159 and 1160. 1161 standing alone. 1162 to 1167. 11 --

MR. DODDS: Just a second, please. Okay.

THE WITNESS: 1168 in a large group, ending with 1211 -- 1168 to 1213, all present in my file.

MR. DODDS: Is 14 a part of that?

THE WITNESS: No, it is not. 14 is another group.

BY MR. HALLADAY:

Q 14 is the next grouping in your file?

A The next group is 1214, according to my file -- of course it might be wrong -- to 1220.

Q 1220?

A Yes. I will check it. They are all consecutive. But I am missing 1215, apparently. It is here.

BY MR. HALLADAY:

Q Do you find it?

A I just can't handle these papers. That is right. They are all there.

MR. DODDS: Through 1220?

THE WITNESS: 1220. Then the final grouping is 1221 to 1224.

KL
3/1/1/22
EA

BY MR. HALLADAY:

Q Dr. Atanasoff, referring back further into Exhibit H-1, we have heretofore had numbered 1,000 before us indicating the number of the project as project 41, do you recall?

A Yes.

Q Can you leaf through these documents and attempt to find one by serial number to identify where if at some point the project numbering changed?

A I think that that point is going to be a bit obscure because I think that at times there were two projects in existence, but apparently 35, the first 35 I find is 1122, and strangely enough 41 came before 35, and I remember that from that date.

Q I notice on 1117 up at the top what looks on the copy as if it were, "Physics Proj. 35"?

A It is. It is. I slipped this one.

Q Then 1118 uses 41 as the identification which continues through 1121, and then on 1122 does it say, "Physics Proj. 35"?

A It does.

Q Is that 1122 a departmental budget statement for applying to some part of May?

A Will you restate your question, I don't have your object line?

5/1/2/23

Q Does No. 1122 consist of a departmental budget statement for a month or a part of a month of May?

A Now, these vouchers were gotten up for departments, but they were also used for these projects, and strictly speaking this is a project budget and not a department budget.

Q I was just referring to the identification of the document?

A I agree. I agree.

Q And it does not appear on the face of Exhibit 1122 so far as I can detect, at least?

A What does not?

Q What year it was?

A Oh, I see. Right.

Q Unless there is some of the hieroglyphics I don't understand?

A Look at the next sheet which is related thereto and that is 41, you see. Now, let's see if that --

Q You mean that is 1941?

A 1941. And let's see if that $6.13 doesn't appear here? And it does.

Q Under the heading of May 31 on Exhibit 1122?

A It does. Yes.

Q So that do I understand from looking at this group of documents, just for illustration, that the invoice from Allied Radio No. 1123, Exhibit 1122 --

5/1/3/24

A Right.

Q -- is in effect posted onto the so-called departmental budget statement 1122 under the date May 31?

A It is. Now let's look to see if we can find the next six dollars --

Q Excuse me for a moment. Just for further cross-bookkeeping reference do you observe on the departmental budget statement, Document No. 1122, the entry May 31 the name, "Allied Radio Corp.," voucher No. 1188, classification 35?

A Voucher No. 1188. Yes, I do.

Q Classification No. 35?

A Yes.

Q Now, from what source do we get that voucher number 1188 if you can tell us?

A Well, the voucher was, I believe an internal document which I should have kept a copy, probably, and is not included here, I guess.

Q Well, if you will look, for example, at Exhibit 1126?

A 1126. Right.

Q You will find, just for illustration there, voucher No. 1177?

A Right.

Q And you will find that voucher No. 1177 referred to on Exhibit 1122?

A Right.

5/1/4/25

Q So that to the extent you have been able, have you included in these accounting records not only the summary but also the supporting vouchers to the extent you still had them?

A That was the arrangement that we made in sorting these documents. We have done so.

Q Do you recall the occasion for the change in description or project identification from project 41 to project 35?

A I remember that it took place and I, the best of my memory is that this occurred when new funds were supplied.

Q By new funds, you mean new funds from what source?

A From any source. And now I, of course, we were getting additional grants from Iowa State University in order to continue the work. Now, a good time to get a new grant would be during the summer like this, you see. So this seems to confirm this, but except for this rather rambling memory I cannot be of help. We will have to go to the records.

Q Well, I observe from looking at Exhibit 1122, the heading at the top, "Research Corp., Physics Proj. 35," which is the same label as I find on the earlier 1177?

A Right.

Q Whereas on, for example, 1112, there looks like an addressograph imprint entitled, "Project," you find 1112?

A I have before me 1112 -- no, I don't either yet. I thought I did. 1112.

5/1/5/26

Q Up at the top it looks like what I would at least describe as an addressograph type of --

A Without any doubt it is that.

Q -- imprint labeled, "Project 41 - Physics," underneath, "Research and Fellow. Grant," and under that capitalized "FUND: GENERAL," have I read it correctly, at least?

A You have read it correctly.

Q Now, are these documents that are now included in Exhibit 41 -- excuse me, Exhibit H-1 -- documents which came to you as part of your functions as project director in connection with the computing machine project that you have generally described for us heretofore?

A They are entirely of that nature.

Q And were they obtained by you in that capacity for your purposes as project director?

A They were.

Q Have these documents, included in Exhibit H-1, been in your possession continuously since their creation?

A They have.

Q And are they part of the official records of the project whether numbered 35 or 41?

A They are.

Q Do they reflect the financial activities in connection with such project, how ever numbered, throughout the period of the existence of such projects?

5/1/6/27

A They do.

Q Will you direct your attention to Exhibit H-2?

A H-2?

Q H-2.

A Right.

Q Now, that is entitled, if I can read the copy that I have before me on the tab, I am looking at the tab, Dr. Atanasoff, does that read, "Labor Payroll Vouchers - #35?"

A It does.

Q What is the content of this Exhibit H-2?

A The content of H-2 is at least some of the papers that came to me in connection with payroll connected with the project. While this says 35 I don't know whether any of 41 came in here or not. I haven't examined it with that in mind but it is labor. Now, this does not include all labor. For instance, none of my own labor connected with this project was ever -- was ever designated on paper and as a consequence came into this file, and the same was true of Clifford Berry's time except for on occasions when his regular appointments had run out, and he had to do some extra work during the summer or the like.

So we have here an enumeration of miscellaneous labor during the project and a cursory examination of these records show that these records are incomplete.

Q What I don't quite understand, and I wish you would

5/1/7/28

explain if you can, the difference between Exhibit H-1 and H-2, why are some documents in H-2 and some in H-1?

A Well, I think H-2 has to do directly with labor. The separation may not be correct, and on occasions you may find occasions when material that should be in H-2 is in H-1. I am sure of that. I attempted to secure this division but naturally the labor in H-2 would be charged to the same source as labor in H-1.

Q Then --

A I mean as to other items in H-1, labor or otherwise.

Q Can you say now whether or not in H-1 and H-2 we have before the Court all of the financial documents that were supplied to you as project director during project 35 or 41 while they were in existence and which, so far as you can determine, you preserved?

A This includes every document as far as I can tell that is in my possession relative to the facts hereof.

Q Now, during a part of the time when you were working on project 35 or 41, were you also involved in some other project that had some other number and some other and unrelated activities to the extent anything is unrelated at least?

A Yes. It is true that during this time I did engage in other activities.

Q By other activities, I meant directly to refer to

7/1/8/29

other activities which had some kind of a project identification?

A I did so engage.

Q Will you state what other project identification or identifications there were during this approximate period of time from 1939 until you departed Iowa State in 1942?

A I do not know the number of the other project. I do not have this in mind. It will be necessary for me to do reference. I hope I have documents that will permit me to secure such a number for you. I cannot do it out of my mind. However, I examined the documents before us, and the personnel before us, and the names which occur herein, and I, it is my personal memory that these names all applied to this project, the computing machine project and not to the other project. The other project had on it a different set of names which could be supplied and these names do not appear herein.

Q We will go back to that at another point then. But in any event --

A I cannot give you the other number, I am sorry.

Q With reference to the documents in Exhibit H-2, are they serially numbered from 1300 through 1304 inclusive?

A 1300 to 1304 inclusive. They are.

Q And were they received by you in your capacity as project director on or about the date which each respectively bears?

5/1/9/30

A They were.

Q And have they been in your possession continuously since then?

A They have. And I would like to make one further remark.

Q Proceed.

A The file folders, to the best of my knowledge and belief date from that very day, both of these file folders, the one we have before us which is now labeled H-2 which at that time did not bear the label H-2, but this label H-2 has been appended, but except for that and except for the initials of the court reporter and the date thereon that he applied, this file folder that I have before me, H-2, came from that very day.

Q What about H-1?

A And H-1 also did. I believe they did. I could be mistaken I suppose. The material came forward to me in this divided form at any rate.

E-5-2

Q All right, sir. Would you now turn to Exhibit F-1?

A Do you know whether this is the part you want to begin on?

Q There are several F-1's, the first thing I want to accomplish is to get them subnumbered so we can tell them one from another.

A F-1 is before us. That's F-1.

MR. HALLADAY: Mr. Anderson, would you please now mark the envelope especially with the F-1, your initials and today's date, then we will open it and do some further identifying inside of it.

(Atanasoff Deposition Exhibit F-1 marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, you will observe I hold in my hand a red filing envelope on which the court reporter has written in red, "Atanasoff Dep. Ex. F-1," with his initials and today's date?

A I do.

Q And, of course, we all know that this file folder was supplied strictly for the purpose of containing the contents?

A Locally of late date.

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Q Right. Would you be good enough to open the file folder Exhibit F-1 and remove its contents. Have you done so that there is a physical separation accomplished?

A I have.

Q And Exhibit F-1 has now been emptied?

A It has now been emptied.

Q And would you sort the documents before you in such a fashion that you can observe their labels or legends. I mean the file folders, excuse me. Just so you can see the labels or legends on the exterior.

A I believe I can make progress on this job.

Q I am just trying to turn them around so they are all facing in the same direction. That one has no marking on it.

A It does somewheres -- maybe it's on the envelope here.

Q We don't have any marking. But that's what I am trying to accomplish, to get some markings on these things so we know what we are referring to when we refer to something. All right. Now, the first document or set of documents that I am taking from you for the present time consists of a file folder currently marked F-1 with Mr. Anderson's initials and the date 11/11/68, do you see what I am referring to?

A I do.

MR. HALLADAY: Mr. Anderson, would you please remark the one to which I have just referred as F-1-A.

(Atanasoff Deposition Exhibit F-1-A marked for identification.)

MR. DODDS: Off the record.

(Discussion off the record.)

BY MR. HALLADAY:

Q Now, do you observe, Dr. Atanasoff, we have a folder now marked Atanasoff Deposition Exhibit F-1-A with Mr. Anderson's initials and today's date?

A I do observe.

Q Which also has on it the marking F-1 with Mr. Anderson's initials and the date of November 11?

A I do.

Q We will put that aside until we get the rest of them marked. You observe I now have before you another file folder marked also F-1 with Mr. Anderson's initials of November 11, correct?

A Correct.

(Atanasoff Deposition Exhibit F-1-B marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, do you observe the file folder to which I have just previously referred that had been marked

F-1 with Mr. Anderson's initials of November 11, also had a label on the tab F-1 in two places the word "photos" written in red, and the typewritten words, "photostats - machine", correct?

A I observe that this is true.

Q Again, without regard to what the contents may be, just trying to get a physical identification.

A I understand.

Q And that file folder now has been remarked by Mr. Anderson, Atanasoff Deposition Exhibit F-1-B with his initials and today's date?

A Right.

Q Very well. Then let's go forward. You have handed me now another file folder also marked F-1 with Mr. Anderson's initials and November 11, 1968 as the date?

A Right.

Q Which I will now have him mark F-1-C.

(Atanasoff Deposition Exhibit F-1-C marked for identification.)

BY MR. HALLADAY:

Q Now, do you observe the marking that has now been accomplished, Atanasoff Deposition Exhibit F-1-C with Mr. Anderson's initials and today's date?

A I do observe.

Q And for further reference do you observe that

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internally to that file folder is an envelope with the followning legend on it, "Also 1420," initials, "JVA, negatives, 1401 thru 1419"?

A I do.

Q As a legend?

A Yes.

Q Correct?

A Correct.

Q And putting that one aside and taking the last one which you have before you. Now, the last one which you have before and which you have handed me has no identification on the exterior but does contain an envelope on the interior which also has no identification on the envelope, correct?

A Correct.

MR. HALLADAY: Mr. Anderson, will you mark this file folder now Atanasoff Deposition Exhibit F-1-D.

(Atanasoff Deposition Exhibit F-1-D marked for identification.)

BY MR. HALLADAY:

Q Do you observe the file folder has been marked F-1-D?

A I do.

Q Then last you have before you a roll of documents. Would you please identify the numbers that appear on each

of the documents in that roll, please?

A The documents in this roll have been numbered by me in a sequence which has been recorded in my files as 1431, 1432 and 1433.

Q Can you by reference to that sequence numbering tell which, if any, of Exhibits F-1, F-1-A, I mean, F-1-B, F-1-C or F-1-D it would be appropriate to put those numbers which you just gave us?

A I believe it goes with F-1-A, but this can be verified upon examination of contents.

Q All right.

MR. DODDS: Off the record. Excuse me.

(Discussion off the record.)

BY MR. HALLADAY:

Q All right. Will you then take F-1-A just so that the record is preserved, identify the serial numbered exhibits that are contained in that original folder?

A Without doubt these will be not in order because of the nature of the contents but we will enumerate each one.

Q If you would, please? And as you enumerate, would you please identify the physical character of what it is that you are enumerating?

A Here is No. 1428 --

MR. DODDS: Just a moment.

MR. HALLADAY: It should be a blueprint

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in yours -- it's a Xerox.

BY MR. HALLADAY:

Q In your original, when I ask you to identify the character, physical character of the documents, I am going to lead you a little bit, I would call this a flimsy --

A I will call it a tracing.

Q All right. On what kind of paper?

A On tracing paper.

Q All right.

A A perspective, an overall perspective of the appearance of the computing machine under discussion taken from a point -- let me put this differently. As you face the machine, the right-hand point has been advanced, the right-hand corner has been advanced towards the observer.

Q The next number that appears in the order in Exhibit F-1-A, please?

A Is 1429.

Q Describe the physical characteristics of that document?

A This is a pencilled drawing, again on a tracing -- tracing on tracing paper. It is a view taken from directly in front of the machine, a perspective taken directly in front of the machine.

Q The next number, please?

A The next number, 1430. 1430 is another perspective on tracing paper drawn with pencil, some cutaways showing a fan in the left-hand panel with the left-hand corner as you face the machine advanced towards the observer.

No. 1446, a handwritten -- a document written in ink on a piece of yellow legal paper, the heading is, "Dear Miss Kimmell."

Q Whose handwriting?

A Handweriting unknown to me.

Q Is there any handwriting on that exhibit that is yours?

A There is none. It says at the top, "Regard Atanasoff -- ".

Q You mean the term is "Re Atanasoff"?

A Re. Yes.

Q Do you observe at the foot of No. 1446 written transversely a note with a name?

A Trexler is the name. And I believe that means that this document was entirely in Mr. Trexler's handwriting but I have not verified this.

Q Go ahead.

A 1447, a slip of paper, I'd say 4 by 6 inches in size, and a note on the left, "File with machine notes," carrying at the bottom the names Barron and Legvold.

Q Is there any writing on Exhibit 1447 that is yours?

A I do not believe so.

Q Is there any writing that you recognize?

A I believe that -- I am not sure.

Q What about the signature?

A I am not sure if this is Sam Legvold's signature. It might have been by someone else. I can't verify the signature without a copy of his signature before me.

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/WS

Q All right. The next number is what, please?

A 1441.

Q What is the character of that?

A 1441 is purported to be a patent drawing on paper that I believe is of standard patent size, containing elements of the machine, and on the -- and two figure numbers in pencil, figure seven and figure eight, although the drawings are in ink.

Q Are there any of the markings in pencil -- excuse me. Strike the question.

Are there various pencil markings on Exhibit 1441?

A There are.

Q Do you know whose pencil markings those are?

A I do not.

Q Next in order is what number, please?

A 1444.

Q What does that consist of?

A This is a drawing in ink on paper probably of a character in size of that employed by the patent office, intended to be, it carries an enumeration in pencil, figure twelve, and some reference numbers in pencil. The hand is unknown to me.

Q Next number?

A The next number is 1445, also on paper of a character in size for using in making patent drawings. The

5/3/2/32

main drawing is in ink, but there are also pencil records thereon, also the figure twenty. The hand is unknown to me.

N-6

Q Is all of the writing or printing and numbering on the original of Exhibit 1445 in pencil?

A All of the lettering and numbering and printing is in pencil.

Q Whereas the drawing proper is inked?

A Is in ink.

Q The next number, please?

A 1442.

Q Will you identify it,please?

A Again, this is a drawing upon the same paper as previously described, suitable for use in patent drawings. The drawing is in ink, but it contains pencilled enumerations thereon. The figure 9 is appended. The hand of these is unknown to me.

Q Proceed, please.

A The next document is 1443. It was numbered by a machine but this has been repeated in pen at the bottom. This is entirely a pencilled drawing. It is a circuit diagram of considerable size. The width is perhaps 8 or 9 inches but the length is 24 or 30 inches. There are on this drawing blocks labeled A, B, C, D, E, F, G, and I which purport to be sections of the computing machine and connections thereto labeled with subscripts of the corresponding letter, such as block A, contains connection terminals A-1 through A-8. Block B contains connections

B-1 through B-7. Block C contains C-1 and C-2, and so forth. Isn't that sufficient?

Q Do you know whether or not any of the markings on Exhibit 1443 are yours?

A I am uncertain. Some of them appear as if they may have been made by me.

Q Do you know the draftsman or person who drew Exhibit 1443?

A I expect the principal person who drew this is Clifford Berry. I would want to examine the enumeration hereon and compare it with samples of Clifford Berry's handwriting which are not before me, and my memory is poor, memory of his handwriting is poor, before stating finally that this is true.

Q With respect to the documents included in Exhibit F-1-A that we have covered so far, do you know whether or not any others should be included in there, according to the method by which you have assembled your file?

A The method of assembling the files is a bit chaotic at this instance and I cannot claim or disclaim that any others should be included herein.

Q Would it be inappropriate to include 1431, 1432 and 1433 in Exhibit F-1-A?

A It would be quite appropriate as far as my knowledge to so include them.

Q Simply thinking of the prospect of locating them at another point and handling the duplicates that Mr. Dodds and I and the Court will be obliged to deal with?

A Right.

Q Would it be appropriate or inappropriate to include also in Exhibit F-1-A, what I would call negative photostats numbered on the back in your original file as follows, 1436, 1439, 1435, 1440, 1438, 1437 and 1434?

A It would. As far as I know, it would be entirely appropriate to include those in this file.

Q Very well. Then for purposes of further reference, let's have them included as best we can in F-1-A. May I gave you a large rubber binder in the hope that it will help include them there?

A I can interleaf them to some extent.

Q I was going to suggest that you put one of the binders around Exhibit F-1-A all the way in the hope that will contain the contents for at least the time being.

A It is going to crush them.

Q Is it?

A Yes. I will put it down here. That is all right.

Q Very well. Now, if you will just put it aside for the moment.

Will you take Exhibit F-1-B, please, and I think the first item in it is an envelope. Does the

envelope have an identification on it?

A It does. Identification number is 1421.

Q There are two envelopes that I see before you, one of which is numbered 1421, and now the other, what identification does the second of the two envelopes in F-1-B have?

A It has 1422 to 1427 labeled on the outside of the envelope.

Q Very well. Will you open envelope No. 1421, please?

A 1421 is before us.

Q And state what identification there is on the contents of envelope 1421?

A 1421-A and 1421-B. The numerals are placed there by a machine process, but the A and B are handwritten.

Q All right. Would you please put them back in the 1421 envelope and turn to the 1422 envelope, please?

A 1422 envelope is open.

Q And what are the identifications of the contents thereof by numeral or other identification?

A These are certain photographs with enumerations on the back thereof from 1422 to 1427, inclusive.

Q Then for clarity, is it correct that the envelope containing photographic prints from 1422 to 1427, inclusive, is labeled on the outside, "Prints 1422-1427"?

A It is.

Q Very well. Take Exhibit F-1-C.

A F-1-C is before me.

Q And will you please state -- that appears to contain an envelope, and what is the identification on the envelope?

A The identification on the envelope is "Negatives 1401 to 1499," and then also the word, "Also 1420", and initialed by me.

Q Would you open the envelope which you have just so identified?

A I have so opened.

Q And the contents of the envelope which you have just opened can be described as what in a general way, more envelopes?

A More envelopes.

Q All right.

A These are lettersized envelopes.

Q Are the lettersized envelopes identified on their exterior?

A By numbers in a serial identification.

Q Would you state the serial numbers that appear on the envelopes you have in your hand?

A These envelopes are numbered by machine in some instances and by hand in some instances, but they contain

the numbers 1401 to 1420, inclusive.

Q That's the letter sized envelopes?

A These are letter sized envelopes.

Q Is there another envelope, also?

A There is another envelope, also, here.

Q Describe that, please?

A This envelope is the envelope in which Iowa State University Photo Experiment Station, Photo Lab forwarded to me certain of the negatives contained herein, and these negatives are to be identified as 1416, 1417 and 1418. At the present moment this envelope is empty but it is included here for reference.

Q And you received the envelope that you have just mentioned on or about what date?

A I refer to the postmark here. I cannot read the postmark with certainty, but I can myself by independent knowledge state that this has been received by me in the last year.

Q Then there is marking on the exterior of that envelope in pen on the end which has the stamp F-1, 1416, 1417 and 1418. Do you so observe?

A Yes.

Q Were those numerals placed on the envelope by you or by your wife?

A They were placed on the envelope by my wife.

Q Then are the negatives referred to by numbers 1416, 1417 and 1418 in the letter sized envelopes?

A They are included in order in the letter sized envelopes.

Q Okay. Then would you look -- and it would be easier for me to follow if you have the envelopes assembled in numerical order.

A They are so assembled.

Q What is the first one then?

A The first one is 1401, and it contains therein a single envelope marked with the legend 1401, and it has thereon the inscription "Prints, 4-22-40."

Q Whose inscription is that?

A I do not know.

Q How long have you had that envelope that you have just described in your possession?

A Since the origin of these files which was during the years 1439 to 1442, and has been in my continuous possession.

Q You have had kind of a mental slip that all of us have by transposing numbers.

A May I repeat? This envelope has been -- the period of the origination of this -- well, what Iwould -- may we go off the record a moment?

Q I think that if you will take the envelopes out

of No. 1401 and just hold it in your hand for a moment all by itself -- and I am not laughing at you.

A I don't mind counsel laughing. That is --

MR. DODDS: You used the year 1439 instead of the number 1439. That's what everybody is laughing at, the year 1439.

THE WITNESS: I don't mind the laughing. Let it be recorded.

BY MR. HALLADAY:

Q I am just feeling very uncomfortable myself.

MR. DODDS: Incidentally -- off the record.

(Discussion off the record.)

(Whereupon an adjournment was taken until 2:00 o'clock P.M., November 14, 1968.)

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7/1/33

November 14, 1968
2:00 o'clock p.m.

(Appearances as heretofore noted.)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

BY MR. HALLADAY:

Q One matter of clarification for the record. I have here the original of Atanasoff Deposition Exhibit J on page two of which there is reference to Exhibits F-1, 2, 3, 4 and 5, and I believe somewhere between us it developed that there is no F-5 but there is an F-6, Dr. Atanasoff, could you just check to be sure that that is correct and if it's so, I would like consent to alter the index Exhibit J just so that it is correct?

A All right. I have two 4's -- three 4's. There is a six but no five.

Q All right. Then when we get there we will --

A Combine the fours.

Q Do some method of establishing the fours but for the outline Exhibit J, may it be understood it's agreeable for me to alter the original just so that I have deleted the five

7/2/34

that is still legible and substituted a six therefor?

MR. DODDS: I have made the same change.

MR. HALLADAY: Thank you.

Mr. Anderson, would you mark Atanasoff Deposition Exhibit S.

(Atanasoff Deposition Exhibit S marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, at the time of our adjournment at 12:15 today, you had made reference to this, although that may not have been the word that you employed, of the documents included in the series 1401, 1402, 1403 et seq. that had theretofore been the subject of some questions from me and some answers from you, and if I may summarize somewhat, some confusion between all of us.

Now, I have had marked as Atanasoff Deposition Exhibit S a Xerox document of three pages of which I have given a copy to counsel for the defense. Would you look at that and tell me if that is the list that you were referring to in your -- I mean that you were speaking about in the testimony that transpired just before we recessed for noon today?

A It was.

Q All right. Now, I am going to ask you, because

7/3/35

of the fact that there are some references in Exhibit S to documents having different serial numbers than we have yet had an opportunity to consider, to put Exhibit F-1C back in shape, put it aside for the time being, and we will go forward to get some other documents identified, the files identified, and then we will come back to the photograph question.

So would you look next, please, at Exhibit F-2?

A F-2 is before me.

Q Does F-2, the folder itself, have a title on the tab?

A It has a title, "Original Ideas - Machine."

Q Now, does that particular file folder as so identified, has that been in the system for some period of time?

A For many years.

Q Do you have any idea how long that particular file folder has existed?

A It comes to me as part of my original file from '42 and before.

Q And then can you state the serial numbers of the documents contained in Exhibit F-2?

A Contained in F-2, the first one I see is 405 and the last one I see is 446. Do you wish to verify if they are consecutive?

Q Would you please do so to see if there are omissions

7/4/36

or any subnumbers?

MR. DODDS: Off the record, I don't seem to have 408.

THE WITNESS: I don't either. They are all present except 408 which seems to be absent from my files.

BY MR. HALLADAY:

Q Do you now know so you can say with any certainty whether there was a 408 or whether we simply have a number machine skip here?

A I have no knowledge except that every effort has been made to preserve the files intact.

Q In any event, it's not a deficiency in the copying process so that Mr. Dodds' file or mine don't contain a 408, the fact is, at least, up until now we don't find a 408 in Exhibit F-2?

A If it is lost it's been lost in the process of my collecting my files and numbering them, but I don't know how it occurred. I can't even answer.

Q Save for that, are all numbers consecutive in Exhibit F-2?

A They are.

Q And are there any subnumbers or letters?

A There are none.

Q Will you turn now to Exhibit F-3, please?

7/5/37

A F-3 is before me.

Q Please tell us what serial numbers that Exhibit F-3 contains?

A 448 to 454 inclusive of which there is one duplicate.

Q By that you mean there are two numbers which are the same?

A Exactly.

Q One machine and one hand?

A I believe that's right. Yes. That is correct.

Q Would you state the duplicated number, please?

A This duplicated number is 449, and the machine 449 is the original and the script handwritten 449 is a carbon copy thereof.

KL=38
WS#8
8/1/38

Q Were the documents contained in F-3 written on or about the dates they respectively bear?

A Yes.

Q Have they been in your possession since the dates they respectively bear?

A They are.

Q Are the signatures contained in the documents in Exhibit F-3 signatures of yourself or others respectively whom you could identify?

A I will have to verify that. I believe so, yes. The answer is yes.

Q Will you turn to Exhibit F-4, please? There are several at present labeled F-4, several folders?

A There are.

Q Would you have all of them before you at once, please?

A I do.

Q How many are there that are presently marked F-4, please?

A There are three.

Q Let's have them in some sort of a sequence. From your standpoint, Dr. Atanasoff, does it make any difference which order we refer to these that have been marked F-4 in?

A I think there's been an error in the numbering.

Q Oh, I am sorry. An error in numbering?

8/2/39

A I would suggest that if no one -- that these folders be numbered otherwise and that the court reporter identify them with a new number instead of going on with this procedure. If we could all agree on that, I think it would be better. There is just too much under F, and I don't know how it got that way. I don't know.

Q Well, is there some problem of the present numbering corresponding with the identification on the outline that we have?

A Let me see that outline. I can't imagine. There certainly is. There certainly is a difficulty there. Yes, that's -- I knew this had to be so.

Q Well, if we take the heading F-4 on the outline, Exhibit J, and assume that it is not limited to computing machine booklet MM's, but may include something else, I personally would prefer that we leave the F-4's on it but give subletters to them.

A I know it is my fault. It must be my fault. I'm amazed at this, but, you know, we could do a good job and I know just how to do it. Now, that is true F-4 material that material right here. Now, here is some widely different subject which contains the material for the approximate solution of equations by means of IBM equipment.

This material belongs in F-4, every bit of it. I thought we had four F-4's here, didn't we? Do we only

8/3/40

have three?

Q There seems to be only three at this point.

A I would like to have only this one withdrawn from the F-4 category, that one --

Q That one that is labeled -- let's not do anything until Mr. Dodds is agreeable to it.

MR. DODDS: Off the record. Why don't we --

THE REPORTER: Are we off the record, Mr. Halladay?

MR. HALLADAY: No, not yet.

THE WITNESS: Can we be off the record?

MR. HALLADAY: It is agreeable with me and I offer to stipulate that we may --

MR. DODDS: Just a minute. I suggested that we go off the record while we were discussing these. I notice the reporter is continuing to record the substance of the discussion.

I should like to ask you, Mr. Reporter, are you instructed to go off of the record only on the request of Mr. Halladay?

MR. HALLADAY: No. According to the usual rule, only by agreement.

MR. DODDS: Well, it has been my practice that if either counsel requests to go off the

8/4/41

record,, to make a statement off the record, he is permitted to do so.

MR. HALLADAY: That's not my practice. I don't go off the record because I want to, but only if you agree.

MR. DODDS: Well, if that's the way you play the rules we will play accordingly, but it was always my understanding that if any counsel wishes to make a statement off the record, he's free to do so.

MR. HALLADAY: It's quite all right if you wish to do it and I wish you to, or if I wish to, then you wish me to.

Now, I am agreeable to going off the record.

MR. DODDS: I agree.

(Discussion off the record.)

(Atanasoff Deposition Exhibits F-4, F-4-A, F-5, marked for identification.)

BY MR. HALLADAY:

Q All right, Dr. Atanasoff, now let's see if we can get the record to reflect what I believe we have arranged for and agreed to while we have been off.

I have had Mr. Sutfin mark the manila folder with Atanasoff Deposition Exhibit F-4, as you will observe before you now, correct?

/5/42

A I do.

Q That's a brand new folder so marked for the first time now?

A Right.

E-9-1

Q Inside of that folder, just to get the record straight, we find in order the following things, one green covered booklet, the first interior sheet which is numbered 455?

A Right.

Q Another green covered booklet, the second inside sheet of which is marked 456?

A Right.

Q One brown covered booklet with the title on the front, the firstinside sheet of which is numbered 457?

A Right.

Q A Manila folder marked F-4 with Mr.Anderson's initials and the date, 11/11/68 crossed out and remarked Atanasoff Deposition Exhibit 4-F-A with Mr.Sutfin's initials and today's date ?

A Right.

Q Inside of which are documents numbered 458, 459, 460, 461, 462, and a further folder with the handwriting on it, "Machine for solutions linear equasions," in pencil and the word, "General," in red with an imprinted label, "Manuals for physics laboratory,Iowa State College,"year blank, course blank, name blank, number blank, with an X on top of that label, correct?

A Correct.

Q Inside of which is a handwritten set of documents

numbered 463, 4, 5, 6, 7, 8, 9, 470, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84?

A Right.

Q Following which is a typewritten set of documents paper clipped together numbered 485, correct?

A Correct.

Q And then the back file folder of that which is marked Atanasoff Deposition Exhibit F-4-A but Mr. Sutfin with today's date has a label on it No. 4-F plus a tattered label with the typewriting on it, "Machine-financial, etc.," correct?

A Correct.

Q And handwritten letters, "F-4"?

A .15, decimal point 15.

Q All right, sir. And we have also arranged this, I am placing before you a file folder which now has on its tab the letters and lettering figure F-5 and the words, "Solution of systems of equasions by the use of punched card equipment," have I read that correctly?

A You have.

Q Which folder heretofore had been marked F-4 by Mr. Anderson with his initials and the date 11/11/68 which has now had an X put over it and a new label written, Atanasoff Deposition Exhibit F-6 by Mr. Sutfin with his initials and today's date, November 14, 1968?

3

A Right.

Q Then it will be necessary, will it not, to correct Exhibit J, the list, to conform to the rearrangement of the files we have just accomplished?

A It will.

Q Then I won't do that while we are on the record. We can work that out between us at a more appropriate time, I guess.

Now, Dr. Atanasoff, will you go back, please, to Exhibit F-1?

A Yes.

Q And will you turn to the lowest serial number appearing therein?

A I have.

Q Do you have before you Exhibit F-1-C, is that correct? It's upside down to you.

A That's all right. Yes, it is.

Q All right. And is the lowest serial number in that exhibit 1400 or 1401?

A 1401.

Q I have also placed before you for reference Atanasoff Deposition Exhibit S. Will you please hold in your hand for me whatever you find in Atanasoff Deposition Exhibit F-1-C that has a numeral 1401 on it, please? If there is any more than one thing with that

numeral hold both, if there is only one thing hold one.

You are holding up what?

A 1401.

Q What is it?

A It is a brown envelope.

Q All right. Is there anything inside of it?

A Inside of it is another brown envelope.

Q And that other brown envelope, what number does it have on it?

A It has the number 1401 on it also.

Q Does it have some other writing on it?

A It has a print with the date 4-22-40.

Q And do you know who put that date on that?

A I do not.

Q Do you know now how long it has been that you have had that particular envelope with the number now 1401 on it and the date 4-22-40 in your possession?

A For many years, probably since essentially the date thereon.

Q All right. Now, is there anything in the envelope that has the date 4-22-40 on it at this time?

A There is nothing.

Q What was in it and what, if anything, have you done with what was in it in connection with your filing system?

A In order to clarify the files, the prints which were in it have been removed. They have been put under other numbers, respectively 402 -- I mean 1402, 1403 and 1404.

Q All right. Would you please put envelope No. 1401 with the date on the outside of it back into the unmarked envelope that has only the machine number 1401 on it?

A I have.

Q Would you return that to its position in Exhibit F-1-C, please.

A (The witness complies.)

Q Will you now turn to No. 1402?

A I have.

Q What is it?

A This is an envelope.

Q Inside?

A A glassene envelope.

Q Excuse me, Dr. Atanasoff, please. 1401 is what?

A Okay. 1402 --

Q Excuse me, 1402 is what?

A Is a brown or buff colored envelope of letter size.

Q And what is inside of it or was until you just took it out?

A A glassene envelope.

Q And is there some mark on the glassene envelope?

A The glassene envelope does not have a legible mark on it but --

Q Then what is inside of the glassene envelope?

A Inside of this glassene envelope are 1, 2, 3 items.

Q State what they are?

A In the first place, there is a print with the number 1402 on the back of it and also on the back is a date 4-22-40.

Q Now, as to that print, do you know who put the date 4-22-40 on it?

A This print came to me with that date on it. I do not.

Q When did it come to you with that date on it?

A At the approximate date thereof.

Q Which was what?

A 4-22-40.

Q The other two items included in that envelope are what in physical description?

A In order to duplicate this item, I had negatives made from it, copies with a camera, and there are two such copies. I don't know why there are two. Perhaps the first one did not satisfy the photographer.

Q And those two negatives that are included in the envelope numbered 1402 were then made from the print that was in that envelop?

A They were.

Q When were those negatives made, approximately?

A Oh, a year ago, approximately.

Q All right. Will you put them back in the glassene envelope and the glassene envelope back in the container envelope.

A (The witness complies.)

Q Will you next turn to envelope 1403. You have it in your hands?

A I do.

Q And what is inside of it, please?

A Another glassene envelope.

Q And is there any mark on the glassene envelope?

A An effort was made to mark this glassene envelope and there is a faint 1403 on it.

L=43
A#9-2
9/2/1/43

Q Inside of the glassine envelope is there something contained?

A There is.

Q State what it is?

A There is a print and the print has on the back of it the printed number 1403.

Q When you say printed, you mean hand printed?

A No. I do not. I mean machine printed.

Q Thank you.

A With a stamper of some kind, one that is used for all the numbers herein.

Q Is that a stamp number that was put on there in the process of numbering the documents?

A It was and of late vintage.

Q What else is on the print that is in the glassine envelope inside of envelope 1403?

A Penciled 4-22-40.

Q Who put that pencil date on that print?

A I do not know.

Q How long have you had that particular print in your possession?

A Since the approximate date thereof.

Q And what else is there?

A There is one negative.

9/2/2/44.

Q And do you know the source of that negative?

A That negative was produced by photographic process by pointing a camera at the print and exposing the film and it was done with, approximately a year ago.

Q Will you reinsert, please?

A I can say two and a quarter by three and a quarter negative too if you wish.

Q And when you have referred to a print in both 1402 and 1403, you are speaking of a photographic black and white print, are you?

A I am. Yes.

Q Will you reinsert the 1403 sequence in that glassine envelope and the glassine envelope and contents, please, back into container envelope No. 1403?

A (The witness complies.)

Q Will you now refer to container envelope No. 1404 in Exhibit F-1-C?

A I have it.

Q Will you remove the contents, please? What do you find the contents to be contained in container envelope 1404?

A A glassine envelope. The glassine envelope is marked 1404, it was so marked by me about a year ago, no, more recently. It also contains a print. The print is marked 1404 and also on it is the following legend in pencil, "4-22-40, with dashes between.

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Q Now, how long have you had that photographic print so identified in your possession?

A Approximately from the date thereon, 4-22-40.

Q In this case do you know who put the date on the back of that photographic print?

A I do not.

Q Was it on it when you received it?

A It was on it when I received it.

Q Will you reinsert the print in the glassine envelope and both of them back into the container envelope 1404, please?

A (The witness complies.)

Q Now, I gather you made no negative print from the original print that you have just put back into envelope 1404?

A I did not.

Q Unless there is a possibility that one of the two negatives in a preceding envelope may have been taken from this print?

A I do not believe so.

Q All right. Will you open --

A I am not sure, that's possible, but I do not believe so.

Q Would you look at the container envelope No. 1405, please, and tell us what the contents are as you remove them?

A Inside of it is a glassine envelope and in the glassine envelope is a three-by-five index card with the

9/2/4/46

number 1405 on it. Also inside the glassine envelope is a print.

Q A print?

A I am sorry, a negative, a photographic negative carrying the legend, "Figure 8," and also imprinted on the negative itself from the original source is a date, "8-7-40," and the initial, "CEB and WCR."

Q May I inspect that original negative that you have in your possession, please?

A (Document handed to counsel.)

Q Do you know when the date 8-7-40 was put on that negative that is presently in your hand but is associated with identification No. 1405?

A I am trying to see what words would be suitable for this subject. I would say that I have never seen this picture without that number on it. It was done at a very early date. I presume at the date thereon.

MR. DODDS: Just a minute. Our copy of the negative does not contain the legend to which you referred.

THE WITNESS: All right. Let's compare them. They were told to retain those things and retain them and to make them equal size and we just have a failure of our reproduction process here.

MR. HALLADAY: Very well. Would you

9/2/5/47

please hand Mr. Dodds back his copy and retain yours.

MR. DODDS: Can I see the copy? I will make a note on this slip with the legends that are missing.

W-10-1

BY MR. HALLADAY:

Q Do you know the physical process by which that date was put on that negative, namely, 8-7-40?

A I believe I do.

Q State your belief?

A When this negative was taken in the laboratory, when the original negative was taken in the laboratory of this device, it was -- you understand it was not necessarily of this size. This is not the original negative. This is a negative from an original print. Now, when that negative was made in the laboratory, a piece of paper was inserted in a holder to cause a blank strip to appear along one edge of the negative. When the negative was taken into the darkroom and developed a strip was left without any darkening whatever. On that strip the legend was written by hand, 8-7-40, CEB, WCC, probably by the hand of these individuals CEB and WCC.

Q Now, as of August, 1940, who had the initials CEB?

A Mr. Clifford Berry.

Q Who had the initials WCC?

A Bill Caldwell. I forget his middle name.

Q Will you please now, while looking at that negative, refer to Exhibit F-4 and remove therefrom Exhibit 455. Have you done so?

2

A I have done so.

Q And will you find in Exhibit 455, figure 8?

A I have done so.

Q Can you say now by inspection of figure 8 as it is contained in Exhibit 455, what, if any, observable correspondence there is between it and the negative that is presently before you which was taken from container envelope No. 1405?

A They are identical. Not quite identical.

Q Describe what, if there are, differences are observable to your eyes?

A The only difference is that while the negative in the booklet --

Q Excuse me. Negative?

A I am sorry, the print in the booklet has the figure 8 written below. The figure 8 is contained in the negative at hand.

Q Now, do you know by memory whether the negative which has the 8-7-40 date on it, the initials CEB and WCC and the term figure 8 which has been contained in container envelope No. 1405, was a reproduction by some photographic process of the positive print figure 8 in Exhibit 455 or if some other method of arriving at that result was employed at the time?

A I know exactly how it was done from memory.

Q State that, please.

A When I was collecting photographs for the present purpose, I had in hand an extra sheet from my files of this character. That extra sheet, I believe, is now a part of the present files and can be exhibited if you desire. It was just an extra sheet like that with the pictures stuck on them but a free one with identical pictures. This w used, taken to a photographer and the photographer reproduced this print from that material.

Q Then to make it perfectly clear -- and forgive me if I lead a little bit -- do I understand that the negative that has the marking on it now, 8-7-40, CEB and WCC, in blank which was contained in envelope No. 1405, is, in effect, a reproduction of a print No. 8 or Figure 8 in Exhibit 455?

A That is true.

Q But from a separate duplicate sheet?

A Which was contained in my original files.

Q Yes.

A And which is present today for exhibition.

Q Now, if you will put the negative in question back into the container envelope, that is, the glassene envelope, in the container envelope 1405.

Let us turn to 1406. Do you have now the container envelope 1406 in your hand?

A I do.

Q Would you please remove its contents? Describe them, please?

A There is a glassene envelope. The contents thereof is a 3 by 5 card. On the 3 by 5 card is the machine printed No. 1406, and also there is a negative.

Q Does the negative have the same markings as were on 1405 negative?

A Yes, with some defects.

Q Was the negative contained in container envelope No. 1406 produced under like circumstances as that just previously described under the heading of 1405?

A Yes, but perhaps we should give the figure number from which it came, since the figure number does not appear there, I believe.

Q Will you do so, please?

A Figure 9 from 455, from Document No. 455.

Q Once again, was the actual photographic process employed with respect to a separate but duplicate sheet?

A It was.

Q Will you put the documents back in order, please, and we will take the next one.

Do you have container envelope No. 1407 at hand?

A I do.

Q Will you remove the contents thereof?

A I have.

Q And describe them?

A There is a glassene envelope. Inside of the glassene envelope is a 3 by 5 card imprinted 1407. There is a little negative.

Q Was that negative covered by the No. 1407 reproduced from figure 10 in the booklet that is now numbered 455?

A It was.

Q But, again, from a separate but identical sheet?

A Identical what?

Q Sheet?

A Oh, yes. Sheet, yes, not from the booklet itself but from a surplus sheet which was left from producing the book.

Q Which surplus sheet is the same or a set of the same sheets which you have with you and are otherwise in the files when we get to them?

A They are.

Q Will you put the documents back in their container envelope 1407, please, and turn to 1408 container envelope. Remove the contents and describe the same.

A The contents are the same, a 3 by 5 card labeled 1408. There is a negative.

Q Does the negative have the reproduction of the date and the initials on it similarly to 1405, 6 and 7?

A It does.

Q And was the reproduction of that negative from figure 11 in booklet 455, but from a separate but duplicate sheet?

A It was.

Q Now, with respect to the negatives contained in cover envelopes 1405, 6, 7 and 8 that you have just finished describing, approximately when were those negatives prepared?

A They were prepared -- they were prepared -- they were photographed, as far as I have any reason to believe, and certainly at approximately the date thereon.

Q Do you know where the original negatives are which resulted in the prints that are included presently in the booklet, Exhibit 455?

A I believe they have been destroyed. A great deal of time and effort has been made by me to secure these prints.

Q Prints?

A These negatives, prints or anything, these pictures. May I make a further remark?

Q Proceed?

A These -- we believe that these pictures were all

taken by the student photography group of Iowa State University which was then located in the physics building. There are certain items of the format which confirms this. However, a search in the photographic laboratory reveals no file, and we have also searched the photo services on the Iowa State College campus with no results whatever.

W-102

Q Have you personally engaged in some part of that search, Dr. Atanasoff?

A I certainly have for many hours.

Q Now, with respect to the negatives that are contained in container envelopes 1405, 1406, 1407 and 1408, that you have said were reproduced from prints of figures 8, 9, 10 and 11, of a set of sheets which are duplicates of those sheets in book 455, from what source did you obtain them?

A Perhaps I best put it this way. Now, the pictures which are contained in 455 and which are also contained, were used on the separate sheets, in other words, what was done was just to take a lot of prints and make up a lot of sheets with those on them, and some of them were used for assembling books and some were not used, and the surplus sheets are merely those which were not used in books. As far as these prints go, these were taken by direct contact or by enlargements from the original negatives

which were taken and labeled by CEB and WCC, or whatever it is.

Q My question was, as to the negatives that you have just referred to, that are in container envelopes 1405, 1406, 1407 and 1408, from what source did you obtain them?

A I took the pictures to a photographer and I said, "I want to secure the most perfect negatives from these prints so I can make further prints and enlargements therefrom," and this photographer is known to me, personally known to me and I can give the name at this time.

Q When did you do that?

A Approximately a year ago.

Q His name?

A Thomas Molesworth, M-o-l-e-s-w-o-r-t-h, I believe, and he is located in Frederick, Maryland.

Q Will you please now turn to container envelope No. 1409?

A Inside of the glassene envelope is a 3 by 5 card and the 3 by 5 card is inscribed, has printed on it 1409.

Q What else is in --

A Inside there are two negatives, not identical, but substantially identical content.

Q When were those negatives prepared?

A These negatives were prepared approximately a year ago.

Q From what source?

A I do notknow.

Q Who made them?

A Mr. Molesworth made them.

Q Would it refresh your memory by looking at Atanasoff Deposition Exhibit S?

A I could.

Q Would you do so?

A These negatives were produced from a print that I obtained from the private files of Clifford E. Berry. These files, as far as I know, are now located at Altadena, California. The print was borrowed, the negatives were made from those prints. The print was returned.

Q Thank you. Will you put the negatives back in the glassene envelope with the card and the glassene envelope back in container envelope No. 1409, please.

Will you look at container envelope No. 1410?

A 1410.

Q Describe the contents?

A The contents are similar. There is a glassene envelope. Inside of the glassene envelope is a card and on the card is 1410. Also in the glassene envelope

is a print.

Q Excuse me, a negative?

A I am sorry, a negative. Correction. Sustained.

Q Now, was that negative produced under circumstances like that referred to under the cover envelope of 1409?

A I believe so. It's my memory, but I would prefer to refresh my memory.

Q Would you do that, please, by referring to Exhibit S?

A They are the same.

Q Turn to cover envelope 1411, please. Will you repeat the process that we have been employing?

A I will. The contents are similar, a glassine envelope, a 3 by 5 card does carry a number. The number is 1411, and there also two negatives.

Q Is the reproduction of the negatives in cover envelope 1411 the same as with respect to --

MR. DODDS: Objection. I think this information can be obtained without such leading questions.

MR. HALLADAY: I will withdraw the question.

BY MR. HALLADAY:

Q Describe the circumstances under which you obtained the negative contained in cover envelope No. 1411?

A May I make an explanation of the process by which this data has been recovered for the record? Would this be helpful?

Q There is a pending question. Did you get the question or would you like to have it read?

A Inside there is a glassine envelope. On the glassine envelope -- inside the glassine envelope is a card. On the card is printed 1411. There are two negatives in here. The negatives are not similar but they have similar content. To be sure, exactly sure as to the source of these negatives, I must refresh my memory from a written list. The same history as 1409 and 1410. That is, these came from prints in Clifford Berry's files.

Q By what process were they produced?

A They were produced by Mr. Moleworth by photographic prints which came from Mr. Berry's files.

Q Will you turn to cover envelope No. 1412, please?

A I have it.

Q Will you remove the contents and describe the same?

A There is a glassine envelope. Inside the glassine envelope is a 3 by 5 card. The 3 by 5 card bears the Number 1412. There is also a negative, photographic negative, 2-1/4 by 3-1/4, I believe, in size.

Q Will you describe the circumstances under which

that photographic negative contained in cover envelope No. 1412 was obtained?

A It was obtained from a print in the possession of Mrs. Berry which was loaned to me for the purposes of photographic reproduction.

Q By whom was the reproduction made?

A It was made by Mr. Molesworth.

Q When?

A About a year ago.

Q Will you turn to cover or container envelope No. 1413, please?

A 1413 is at hand. There is a glassine envelope. Inside the glassine envelope is a 3 by 5 card. There is als a negative therein. I will --

Q Describe the circumstances under which the negative contained in container envelope No. 1413 was produced?

A This negative was made from a print. This print was found bound or loosely bound in an album owned by Mrs. Berry at this same address as above.

Q What kind of an album?

A It is a photographic album with inserts, you know, cut so you can insert prints and that's where I found this.

MR. DODDS: I think the record should

show that the witness is referring to Exhibit S for the material to support his testimony in explaining the origin of these negatives.

BY MR. HALLADAY:

Q Do you agree with that, Dr. Atanasoff, that you have done so?

A I certainly have done that.

Q All right. Will you turn to container envelope 1414 after returning that which you have in your hand into 1413. Describe the contents of 1414, please?

A There is a glassine envelope. Inside the glassine envelope is a 3 by 5 card imprinted with 1414. There is also a negative. The negative was reproduced by a print found in an album in Clifford Berry's house by me. I found that album. Mrs. Berry didn't furnish me that. I went there and discovered the album. Likewise, this remark also applies to the previous print.

Q Have you returned the documents to cover or container envelope No. 1414?

A I have.

Q Will you now do the same process with 1415, please, describe the contents of the glassine envelope.

A Inside the glassine envelope is a 3 by 5 card printed with 1415 for identification purposes.

There are inside the glassine envelope two negatives. These two negatives have slightly different sources.

Q Is there any way of telling which one is which and which came from which source?

A They came from originally a common source but I would like to describe the two sources.

Q Will you do, please?

A For the purposes of the record, Mr. Norman who was present at the inception, roughly at the inception of the machine and who is now in the employ of the General Electric Company as patent counsel took this picture with his own, the original negative with his own hand. He had in his possession one print that had survived the time. He had a negative made from this print and he had one picture printed from this negative, this second negative, not the original negative, the second negative, and he gave me that print that was the source of one of those negatives.

Q When was this done?

MR. DODDS: I object to that answer because it obviously relies on hearsay of what Mr. Fulmer told the witness, unless the witness was present when Mr. Fulmer performed the operation which he described.

KL=48
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11/1/1/48

BY MR. HALLADAY:

Q Go right ahead, Doctor.

A The other, in order to secure the most accurate presentation of this, I asked Mr. Fulmer to lend me the original print which he had in his possession which was taken from the original negative. He did lend it to me. I had Mr. Molesworth prepare a negative and that negative was used, is present with us as a second negative. Since the source is common and the two pictures are nearly identical, although of a different size.

Q What happened to the original print?

A I believe it is also in the files here somewhere, I hope it is and I believe it is.

Q That you received from Mr. Fulmer?

A Yes.

MR. DODDS: I object to the second preceding answer on the same basis, based on hearsay.

BY MR. HALLADAY:

Q Will you return the negatives to the glassine envelope and the glassine envelope back to cover envelope No. 1415, please?

A (The witness complies.)

Q Will you now turn to cover envelope No. 1416 and describe the contents?

A Inside is a glassine envelope. In the glassine

11/1/2/49

envelope is a three-by-five card. It has printed on it 1416 for identification purposes. It also has the negative.

Q State the circumstances under which that negative was prepared?

A This negative was made at my request by Iowa State College Photo Service from a print contained in Clifford Berry's Master's thesis.

Q When?

A About a year ago. Within the last year.

Q Will you return that negative to its cover envelope and take the next one, please, 1417?

A 1417 has exactly the same history as 1416. Will this suffice?

Q Will you put that back in the cover or container envelope and turn to 1418, describe the contents and their source?

A 1418, glassine envelope, inside the glassine envelope is a three-by-five card. The card has on it 1418 and it has on the other side, by accident, some hieroglyphics made by me. These sketches on the back, and I can state what they are at this time.

Q Do so?

A They were very rudimentary doodlings on the design of weighing machines or balances, not very deciperable but

11/1/3/50

that's what they are.

Q Made about when?

A Made within the last three or four months. There is also a negative. The negative has the same source as the negative, the two negatives preceding.

Q Will you return those documents to their container envelope No. 1418 and now take 1419, remove the contents and describe the same?

A Inside the legal -- I mean the letter-sized envelope there is a brown paper envelope and inside the brown paper envelope there is a print and a negative.

Q Now, with respect to the brown paper envelope contained -- container envelope No. 1419, does it also have a number stamped on it?

A It has a number 1419 to identify it as part of this exhibit.

Q Then is there some writing on one side of that small brown or tan photographic envelope?

A There is.

Q Whose writing is it?

A I do not know.

Q How long have you had that particular envelope in your possession?

A That envelope, that file and that negative have come to me from these years. By these years I mean to say the

11/1/4/51

period from 1939 to the end of '42

Q Inside of the envelope with the writing on it which also has the imprinted number 1419, there is something else?

A There is a print.

Q First then direct your attention to the print. On the back of the print is there a number?

A There is a number 1419 placed there by me recently to identify that item.

Q Are there any other markings on that print?

A There is a faint 37, a 39 and a zero there.

Q In pencil, pen or by what marking object?

A Pencil, it seems to me.

Q Do you know whose markings those are?

A I do not.

Q Are there any other markings on that print?

A I believe not.

Q How long has that print been in your possession?

A The same length of time as the envelope that it's contained in.

Q Then there is also in your hand taken from the envelope a negative, is there?

A There is.

Q State the circumstances under which that negative was obtained by you?

A The negative, the print and the envelope were

11/1/5/52

obtained from me at the same time -- this was given me at the time that the photograph was taken.

Q Will you return those documents now to the container envelope No. 1419 -- excuse me, just one moment.

A You didn't get that.

Q Do you know of your own knowledge who took the photograph reflected by the negative or the print contained in envelope number 1419?

A I do not, but I have endeavored to ascertain who did it with some =- I have obtained some information on the source.

Q Of your own knowledge going back to when the photograph was taken?

A The identity of the individual is unknown to me.

Q And will you return that now, please, to the container envelope 1419 and turn to envelope number 1420. What is the content of envelope 1420?

A 1420 contains only a print.

Q By examination of that print as you hold it in your hand, does it have a number on the back?

A It has a number 1420 on the back of it.

Q And purely by reference to that print as you hold it in your hand can you state the source?

A I can,

Q What is it?

A This is the identical print supplied to me by

11/1/6/53

Mr. Fulmer.

Q When?

A Eighteen months ago.

Q Will you return that print to its container envelope 1420, please?

11/2

A (The witness complies.)

Q And turn to container envelope 1421. I'm afraid I have committed an error by referring to container envelope 1421.

A Yes. I don't know what container you desire, I am afraid at this time, but I see that I am in a slight confusion here.

Q That's all right. Will you turn to folder Exhibit F-1-B?

A F-1-B.

Q It may be back there.

A F-1-B is in my hand.

Q Will you find if you can in Exhibit F-1-B No. 1421?

A I have it in my hand.

Q Is that a container envelope?

A It is an envelope, a large envelope.

Q Does it have 1421 on the outside of it?

A It does.

Q And what is inside of it?

A 1421-A and 1421-B, two 8 -- two letter-sized sheets

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of paper on which are pasted photographs and the sheets of paper are labeled 1421-A and 1421-B.

Q How do those two sheets now identified as Exhibits 1421-A and 1421-B compare if at all with the photographs showing figures 8, 9, 10 and 11 contained in the booklet Exhibit 455, I am asking you to look at the print in Exhibit 455 side by side?

A They are figures 8, 9, 10 and 11. They are exactly like that.

Q What I am asking you to do physically right now is turn to figures 8, 9, 10 and 11 in Exhibit 455.

A Yes. They are identical.

Q Are Exhibits 1421-A and 1421-B sheets of paper?

A They are sheets of paper.

Q On which --

A Letter size.

Q On which are mounted something?

A On which are mounted photographs, prints, photographic prints.

Q How long have those sheets 1421-A and 1421-B been in your possession?

A Since August of 1940.

Q Is there something else in the envelope?

A Yes. There is another print.

Q Will you take it out, please? Does it have a

11/8/55

number on the back of it?

A 1421-C.

Q What is 1421-C?

A 1421-C is an original print taken from the original negative that is made, that was used in photographing the machine on the date thereon which is 8-7-40, eight being August 7.

Q How long has that print 1421-C been in your possession?

A It has been in my possession ever since that time. I can make an additional remark about this print.

Q Go ahead.

A This print was pasted on a sheet of paper also but it happened to fall off and hence came loose into my possession.

Q Will you put Exhibit 1421-A, B and C back in container envelope No. 1421.

A (Witness complies.)

Q Do you still have Atanasoff Deposition Exhibit F-1-B before you?

A I do.

Q Is there contained in it another container envelope?

A There is.

Q What is the number on the face of that container envelope?

11/9/56

A The number on the container envelope is 1422 to 1427.

Q Will you open that envelope, please, and remove the contents and describe the same, first do they have numbers on them?

A They do on the reverse.

Q What are the numbers?

A The numbers are 1422, 1423, 1424, 25, 26 and 27.

Q Can you identify the source of prints 1422 and 23?

A 1422 and 23?

Q If you have any doubt or need any memory refreshment please refer to Atanasoff Deposition Exhibit S, the list.

A Well, I will make a guess from my memory.

Q I don't wish you to guess. If you can say your best memory without refreshing it you are supposed to do that.

A Well, I am almost certain that I know where they come from but I believe it will be most orderly if I refresh myself by a list which I have kept during these years with regard to this material.

Q All right, sir?

A And the substance of that is contained in this Atanasoff Deposition Exhibit S, and referring to that, referring to the numbers thereon, 22 to 27 inclusive, we find as follows: Prints 22 and 23 are two prints received from

11/10/57

photographs, from recent photographs of condenser drum. This condenser drum is in existence for inspection at Iowa State University at the present time and Mr. Orr procured these prints from somebody, somebody in the computing department. He procured them from me, and I think that the source was Mr. Stewart in the computer department but I realize that this is hearsay.

Now, 24 to 27 inclusive, these five prints were handed me by Mr. Bradley, a patent attorney in Chicago who visited it and also took pictures of it.

Q When did you get them from Mr. Bradley?

A A year, 16 months ago, approximately.

Q Will you return the prints to their container envelope, please.

A (The witness complies)

MR. HALLADAY: It's now 3:35, would this be a convenient breaking point?

THE WITNESS: Fine.

MR. DODDS: Yes.

(Recess taken.)

W-12-1

BY MR. HALLADAY:

Q All right. Shall we go off the record? Dr. Atanasoff, will you tell us by what means or from what source you prepared the document you have before you marked Atanasoff Exhibit S?

A I will.

Q Do so, please.

A A great deal of document S exists firmly in my memory, but I suspected my memory, when it came to correcting a lot of prints from a lot of sources and assembling them, I knew it would be possible to slip on one print. So to avoid this, I had, every time I had prints made, I had 8 by 10 enlargements and they were put in an album and next to each print in the album I put the source, I slipped in a little card which showed the source. This was used in preparing this and such other information as I had at hand.

Now, for instance, if we look at 1434 on the last page, why, I knew that, I knew from my own memory that that was a photostat of a patent drawing. That was not obtained from a slip in a book. Itwas obtained directly from my memory.

Now, 1431, that original drawing, I remember the only time I ever had that kind of a paper around was the time I was making drawings of this and I knew

that that was the original patent drawing. I recognized it. I knew that it has the contents.

So a great deal of it was from memory, but a few items, particularly on pages, the first two pages to insure the source I took those notes which I in effect made and kept in a peculiar way, and I may remark that there alive a lot of other people with that information if you wish to verify it.

Q Will you direct your attention now to Atanasoff Deposition Exhibit F-1-D?

A All right.

Q Does that contain an envelope?

A It does.

Q Are there any markings on the envelope?

A There are no markings on the envelope.

Q Will you remove the contents from the envelope, please? State what the contents are?

A The contents of this envelope are 8 by 10 prints prepared by Mr. Molesworth of Frederick, Maryland, at my direction and from negatives which have been previously described.

Q When were those 8 by 10 prints produced?

A Recently, within the last, entirely within the last 14 or 16 months.

Q On the back of each of the prints are there some

identification marks?

A Yes, there are.

Q By whom were those identification marks placed on the back of these prints?

A These, I believe these were done by my wife.

Q And will you state what the respective identificatio are?

A Well, the principal identification there is 1402, 1403, 1404, and those identifications are the file numbers of the negatives from which each respective print was taken. Also contained on the back was the file number F-1 in which these prints are found, and also -- I mean, in which these negatives are found, and also another note on each of these prints was inscribed there.

Q And the other note was inscribed by whom?

A By my wife.

Q How recently?

A Within the last month.

Q And the other notes as inscribed by your wife are intended to reflect what?

A Just to jog my memory if it needed it as to where the source of the print was. In F-1, 1402, that means the negative from which it was taken, and "From print in JVA's files," is the original source of the photographic material from which this material was taken.

Q In other words, this is written on the back of each of the photographs contained in Exhibit F-1-D for cross reference to other numbered negatives as identified in the course of your testimony here?

A Right, and also a hint as to the original source. For instance, on print F-1, 1419, the file number of that print in this file is 1419, but also she says, "From JVA's files," which means the original source of the photographic materials from JVA's files, and it went back and it's been in my possession since approximately the 18th of May, 1942.

Q Will you please state the serial numbers that are on the back of the photographs that are now before you?

A All right. I will read the list.

Q Well, I want the serial number and then I want, without any interpretation as to date or anything else, the purport of the photograph so that we know from the typewritten transcript what it is you are talking about. Can you do that or do I make myself unclear?

A You have a man who is fuzzy at your hands, sir.

Q All right. I will rephrase the question. What I would like to ask you to do is to state the number on the back of each photograph one at a time and then state what it shows up on the front of the photograph?

A I will.

Q But I don't want detail. I am simply trying to accomplish a written physical statement of what these photographs are.

A Here is the first one. It's F-1, 1402 on the back. On the front is a photograph of the machine at an early stage showing the frame and some other details. Is that--

Q That is sufficient for the purposes I have in mind at this time.

A The second photograph --

Q Rather than referring to an early stage, if you can state the physical objects that show up on the photograph I think this would be preferable.

A F-1, 1403, this is a photograph -- the previous photograph was from the back and this is a photograph from the front showing the frame, the mounting strips on which the add-subtract mechanisms were ultimately to be mounted -- in fact, one is in place -- the driving motor, the pulley and the slow speed shaft in place.

W-12-2

Q Proceed.

A The third one, F-1, 1405.

MR. DODDS: Excuse me. I assume there is no 1404?

THE WITNESS: It's not here. It's in the other file but we don't have an 8 by 10 of it. You're not being supplied with one, I am sorry. Maybe

this is an error. I don't know.

Q What is the appearance of the photograph itself?

A 1405, the appearance, this photograph shows one of the condenser drums as it was originally constructed. 1406, this shows two aspects of the add-subtract mechanisms or logic circuit which was used in this computing machine.

1407 --

Q Excuse me. As to 1406, what are the physical objects that show up in the picture?

A I am sorry. The physical objects which show up on the upper view are vacuum tubes. The are, as a matter of fact, vacuum tubes identified by the No. 6C8G, capital C, capital G, 6C8G. Seven 6C8G's show up on the top side and on the bottom side we see the, principally the resistive networks which accompany this device.

Photogrpph F-1, 1407, that means it's drawn from that particular negative. We see a rear view showing the slow speed shaft in place, also the back speed shaft, the gearing between them, the two condenser drums in position, and in the rear can be seen the racks for the mounting of the add-subtract mechanisms and a number of add-subtract mechanisms in place. Underneath can also be seen the filament transformer as well as the motor which drives the device.

Q Next, please?

A F-1, 1406, this is a photograph from the front of the machine with the right-hand corner advanced towards the camera. One sees the two drums KA and CA, the gearing, the pulley, the motor, the filament transformer, a power supply in position, the racks on which are mounted, on which will be mounted all the add-subtract mechanisms, with 1, 2, 3, 4 in place. This frame is obviously on castors. The frame is welded of angle iron.

Q When you said drums KA and CA, was it your intention to identify them in their position on the photograph from left to right?

A Yes, it was.

Q Next, please.

A Next is item 1409. This is a photograph taken from below the machine looking upwards and shows at the left the drum used for conversion from base 10 to base 2, and underneath we have the two structures which carry a special card, a special base 2 card for recording base 2 numbers.

You see some of the mechanism under there which is used for initiating the motion of the card and for moving it through these devices.

Q Why physical objects that you have not described appear on that photograph?

A Rollers.

Q Pardon?

A Rollers.

Q What else?

A The frame.

Q Anything further?

A I am not sure.

Q All right. Next, please?

A I am sure of something else but -- 1410 is also a fuzzy picture. This is a view from above and from the front. One sees at the right, at the right one sees the high speed shaft. On the high speed shaft is mounted a drum which is used for carrying from place to place. This drum also has condensers in it and it is used for carrying from place to place. The worm gear behind drives the slow speed shaft. Directly in the center of the top is the condenser drum called CA, and at the front edge of it are brushes bearing thereon.

Next is a cylinder. To the left of that drum is a cylinder which is used for actuating certain controls in the device, and to the left of that still is a cover which covers the second condenser drum called KA. In the foreground are displayed a number of the add-subtract mechanisms which have been previously seen.

Q Comprising what?

A Add-subtract mechanisms comprising the logic

circuits for add-subtract mechanisms.

Q Insofar as we can see on this photograph, what are the objects in the foreground?

A There are the add-subtract mechanisms in the rack. I am not saying --

L=58
LA#13
13/1/58

Q Consisting of what physical objects?

A There are vacuum tubes, of course. Did you intend I should say that?

Q I don't know what my intentions are, Doctor.

A I don't either. That is the problem, I am afraid. But I think that's a pretty good picture there. You see, it's a poor picture but I mean it does show something.

Q Next photograph, please?

A The next photograph is No. 1411. It is drawn from that negative. It is a poor photograph. The exposure was not right. That is Mr. Clifford Berry standing there, and he has his left hand and right hand on the base ten card reader which was used for injecting numbers into the device. To the left of the base ten card reader stands the two, card reader and card punch, which were used for handling a different set of cards, larger in size which contained much more data and which were used as a slow-speed memory in this device and which record with base two numbers.

Q Next photograph, please?

A The next photograph that I have here is labeled 1412. Now, you see the motor has changed its place in this photograph. Normally it drove the high speed shaft by a belt and pulleys. Now it drives the high speed shaft by gearing so that the high speed shaft operates in synchronism with the AC source, this being a synchronous motor, a salient pole synchronous motor.

13/2/59

Now, you see there the covers in place and certain controls on the right-hand side. You see the two covers for the two drums in the rear. Next toward the left is the base ten card reader and to the left of that still the base two card reader and punch.

Down below at the right-hand side of the picture is the power supply. Behind it, hardly visible is the filament supply. We see the racks containing add-subtract mechanism, if you will, 15 of them on this side and 15, presumably beyond, making the full complement.

The bank of tubes to the left of the vertical member of the frame and in the foreground are thyratrons used in the base two card punching circuits.

Further to the left is a bank of transformers used in the base two card punching circuits.

Behind the thyraton bank is another bank of vacuum tubes. These are, as a matter of fact, also 6C8G's with grid caps. And there are here five columns of tubes. The right-hand one nearly obscured by lthe vertical member of the frame, nine high, making a total of 45 tubes. These are the tubes that are necessary for the regenerative circuits necessary for regenerating the memory of KA.

Q Next, please?

A 1413. Here we have a photograph taken slightly from the rear and from the right-hand side as one would face the

3/3/60

machine from the motor end. You see the geared motor in place as was shown in the last photograph, you see the rear. Now, you see I wasn't joking when I said there were vacuum tubes behind those racks because they are in sight here. You can see a good many of the other appurtenances. You can see the end of the CA drum there. You can see the carry, some of the carry drum and the carry brushes which contact that drum. I believe this comprises the principal parts visible here.

Q Next, please?

A 1414. This is a photograph taken from below. This shows the multiplicity of leads coming from a terminal block. This terminal block is associated with the base ten card reader. You can see the wires laid in there by the workmen who worked on the machine.

Q The wires connect to what physical object as viewed in the photograph?

A Well, they originate at one end with the base ten card reader --

Q I am just asking about --

A And then they go into switches, into switches which are necessary to distribute what is in a base ten card into the various portions of the add-subtract mechanism. They also connect with the base ten base two converter.

Q What are the physical objects situated in

13/4/61

approximately the center of this photograph No. 1414?

A That is merely a terminal block, approximately in the center. This is a large terminal block. You can always find, if you need a terminal block, you can always depend upon the telephone company to throw one away about the time you need it. So this was obtained by using a throw-away from the telephone company.

Q Next?

A This is another picture.

Q Number please?

A Pardon me. 1415. This is Mr. Clifford Berry standing by the machine with his hands on some of the controls. I think most of the rest of it is clear. You will notice one small change. We got in a jam and had to move the filament transformer over to the other corner. You will see it in the lower corner there. I think in the other photographs the filament transformer was on the right-hand side of the machine. In order to get a transformer of suitable capacity we had to build it.

Q Next?

A This is photograph 1416. This shows the left-hand end as you would be facing the machine of the card reading and card punching mechanisms. These are identical in physical structure but not in electrical structure. You see the four pins in the upper right-hand side, two acting on each, in each

13/5/62

of these and moving in slots. These are the pins which give the card an impulse in phase with the operation of the machine to start it traveling in synchronism between the rollers here depicted. The rollers are driven by gears off a third shaft which has not been presently described and which is just behind the bar. You can see a gear upon the third shaft in the left hand, at the left center. You can see a gear which is mounted upon the third shaft.

Q In the background at the top of the photograph can you identify the appearance there?

A Yes. I can identify the appearance. In order to make --

Q What is it?

A -- a clean photograph, we have covered the objects to the rear with a drop cloth and that is merely a drop cloth.

Q Next, please?

A I am looking at photograph No. 1417. This is an upper photograph of the two card reader and card punch of the base two kind. In the end, the one in the front, and we are at the front of the machine so the one at the left is the card punch and the one at the right is the card reader. The card punch was placed at the left so that the leads from the transformer bank which are below would be as short as possible and wouldn't have to travel through the structure. As I said, the physical details are much the same but you lay a card in

13/6/63

there, you don't have to lay it any particular way because the pins come up and contact it and feed it through the rollers in synchronism, and the message is read from the card. All this you wouldn't pay attention to for an IBM tabulator.

Q What is in the back and upper right-hand corner of the photograph?

A Again we find the drop cloth used to isolate the photograph.

Q Is the next one 1418?

A 1418, yes. Now, 1418 --

Q Excuse me just one moment. In observing photograph No. 1418, which view of it --

A It really --

Q -- is right side up?

A It really should be looked at that way.

Q You see the problem is this record doesn't tell what that way is and I was trying to get a reference?

A All right. Now, you will see the plate with scratche on it, that should be at the top of the picture instead of the bottom.

Q And there is a transverse member that is dark in color running from left to right in the upper foreground. Does that describe anything you see with your eyes?

13/2 starts

A That is the upper member of the frame.

Q So that do I gather this photograph is taken looking

13/7/64

upward?

A It is, yes, looking upward.

Q What do we see?

A Well, we see the cam mechanism by which those two pins on the top of the card reader are driven. You see the roller near the center. You will see a cam follower, a roller bearing on a cam which is behind it there and that cam drives the shaft which, more or less horizontal shaft which is in the picture, and then the arm moves the pins through the linkage herein shown. At the right is an electromagnet used for releasing the cam on signal so that it will follow and drive the cards through. In other words, you can lay a card in there without snatching it in between motions and then the machine on the proper process will start the motion of the card through, call for the card, start it through, read it, and that mechanism there is for that purpose.

Q Is that mechanism in physical appearance something like a cylinder to my uneducated eye?

A The solenoid is a cylinder in the right center in the background.

Q Next, please?

A The next one is the most complete.

Q Excuse me. Number, please?

A The number is F-1419. And it shows a great deal

13/8/65

of the wiring in place. You see the controls at the right, the cover on CA but no cover on KA. You see the condenser drum KA showing in the top center of the photograph. To the left of that on the slow speed shaft is the table, mechanized table which does the conversion from base ten to base two or the reverse. You see, just this side of the control panel you will see the base ten card reader. In the foreground are the base two card punch and base two card reader. In the lower right are pictures which show the vacuum tubes. You see the vacuum tubes toward the rear of the grid caps. Those are all 6C8G by name. In the foreground are thyratrons and their numbers escape my memory, but you notice there are no grid caps there and that gives me the cue that those are the thyratrons, and prevents me from making a mistake. And there is one little spot that shows some more vacuum tubes behind there, a little gleam, and that is the other set of tubes which are used for the regenerative memory.

Now, the cylinder shown here is KA. KA is generated by those tubes below but CA is regenerated by the action and coaction of the add-subtract mechanisms. This picture also shows, indicates the existence of a third shaft which you see the gear, at the left center you can see the gearing which drives the third shaft which is parallel to the member nearest the camera, sloping off to the left there.

Q Would you put the photographs back in their

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14
kz

1/9/66

envelope and return them, please, to Exhibit F-1-D?

A Yes. F-1 --

Q I simply asked that they be returned so that the record that the reporter is making is complete. They have been returned to F-1-D which you have?

A They are returned to F-1-D. There they are. Okay.

Q Thank you.

MR. HALLADAY: I would like about a five-minute recess if I might, please.

(Recess taken)

W-14-1

BY MR. HALLADAY:

Q All right. Doctor, will you locate among the files before you now that which has been marked as Atanasoff Deposition Exhibit I?

A I believe it's this one. Yes, it is. All right. It's before me.

Q Now, this is one which is not reflected on the outline or index that you had prepared that is Exhibit J?

A That is true.

Q Will you, therefore, turn to Exhibit I and state the number of the first document contained therein?

A 1501 and 1502.

Q Insofar as Exhibit I contains carbon copies of letters bearing your name, were those carbon copies of letters prepared under circumstances and the originals handled under circumstances like those which you have heretofore described with respect to similar items of correspondence?

A They were.

Q And insofar as Exhibit I containing original letters addressed to you, were those original letters received by you as you have described the other similar original letters?

A They were.

Q And with respect either to carbon copies of correspondence or originals of correspondence from or to you, in each instance in Exhibit I have the same been in your

possession since on or about the date which each respectively bears?

A They have.

Q Inside of the folder marked Atanasoff Deposition Exhibit I following 1502, is there another folder?

A A Manila folder.

Q And does that Manila folder have a label on it?

A It says "Rough computing machine manuscript."

Q How long has that Manila folder been in your possession?

A Since the time it was written and it was written in July and August of 1940.

Q Now, in that Manila folder, which, incidentally, does not bear a number, does it?

A It does not.

Q Inside the Manila folder are the numbers consecutive from 1503--

A Right.

Q -- through 1551?

A Yes.

Q Directing your attention to the numbers 1503 through 1521, do you have those sheets before you?

A I do.

Q What are those sheets?

A Those sheets are a part of the manuscript preparing

process of one J. V. Atanasoff in the year of 1940.

Q Now, I suggest, Dr. Atanasoff, you read a little bit of 1503 to yourself.

A I am well aware what is there. I don't have a bit of doubt what is there. Unless I am going crazy or something, I know exactly what is there.

May I continue?

Q You may.

A You will find in this file a great deal of material, not only here but in other places, which these were just efforts of mine in perfecting that manuscript which is contained in the green book, and this is one of these efforts.

Q When you say green book, you mean Document No. 455?

A I will procure the number. I reach into my files and I procure a green book with a number 455. This is called the manuscript and will be referred to as the manuscript or the booklet many times from this point on, but when I say the manuscript or the booklet, I will mean 455 or 456 or the other booklets which accompanied them in those years and which are not available to us. In the preparation of 455 of the manuscript or the booklet 455 or 456, these are two of the original manuscripts which have come to me untouched to this day. They have been

bound all this time, to my knowledge. Now, in the preparation of this material, I did things like you see before you.

Q You are referring now to 1503?

A Yes.

Q Through 1521?

A Well, let's see if it follows that character. Yes. You will find there also some of the original manuscripts for this booklet.

Q When you say original manuscripts for this booklet, what number are you referring to?

A The booklet is -- I beg your pardon. Some of the original manuscript?

Q Yes.

A The original manuscript in this supply and other places where this material is that's got scattered through my files and this, I notice that page 1544 and 1545, 1546 and 1547 and 1548 and 1549 and 1550, 1551 are all part of my original pencil manuscript for this booklet 455.

Q Document No. 1533, in whose hand is that?

A 1533, that is also in my hand.

Q On the original which you now hold there are some red marks, are there?

A There are.

Q Whose red marks are those?
A Those are in my hand.

KL=69
14/2/1/69
WS

Q On the reverse of 1533, is there also No. 1534?

A There is, and also there at the top of the page is the Arabic number two and "Method of Mechanizing Solution of Systems." This is underscored. It means --

Q Do you know who typed it?

A I do not. I don't know because I had several typists.

Q Now, throughout the pages of typing at various places there are handwritten interlineations?

A Yes.

Q Whose are those?

A Well, I will look at any one you wish and I will tell you if it is mine.

Q Let's go back to 1503, the first sheet in the set contained inside the folder labeled "Rough Computing Machine Manuscript."

A Yes. Those are not in my hand.

Q I observe from where I am sitting that on that sheet those red -- those interlineations are in red?

A Right.

Q Do you know whose interlineations those are?

A They might well be Clifford Berry's. I don't know. I was writing the manuscript but I had proofreaders assisting me.

Q On 1505 there are some red interlineations. Are

14/2/2/70

those yours or someone else's?

A They are someone else's.

Q 1506, the same question?

A I cannot tell there.

Q 1507?

A Well, you see the principal pen marks there made are in my hand.

Q The pen being at the top of the page?

A Yes, and at the bottom opposite the number 1507 is my handwriting. Add-subtract mechanism is printed by me. Those i equals 1, n plus 1 at the right-hand side are in my hand. I see nothing there that I'd suspect was not mine except perhaps the red remarks, I mean, the red notes one inch below the top of the page. They may be made by someone else, I don't know

Q You used the term add-subtract mechanism on page numbered 1507. Would you turn back to it? You used the phrase add-subtract mechanism as having been put on by you and I am wondering if you were referring to the letters ASM?

A I am referring to that.

Q All right. On page 1508 there are some penned corrections on the original before you?

A Now, I would say that the "for" was written by somebody else but the "that" was written by me. The "8" was written by me. The "minus 50" was written by me. The red

14/2/3/71

marks on 1509, I am uncertain; probably not by me.

Q 1510?

A The words at the top of the page and the numeral two were written by me.

Q And the word "balance" down below?

A That was not written by me. You know, I could slip on one of these. I am just doing my best, but I am pretty sure.

Q In any event, let me ask you this question. Are there any alterations on the documents marked as Exhibits 1503 through 1521 that were made at a date later than the date of the manuscript, Exhibit 455?

A Since the typing of those original manuscripts 455 and others that accompany them, there were two typings at that time. Since that time, nobody has touched this manuscript, to the best of my knowledge and belief. I am sure this is true.

Q When you say nobody has touched it --

A I mean to say in the sense of making, of taking a pen to it and making any alterations. I didn't mean that nobody had picked it up, of course.

Q Then directing your attention to Documents numbered 1522 through 1533.

A On page 1526 I see the word "computations" written there in red pencil and that was written by my hand. All of the ink -- as far as I am now, all of the ink marks were written by my hand.

Q May I ask this, Dr. Atanasoff, whether or not documents numbered 1522 through 1532 predated Exhibit 455?

A They did.

Q Is that true also with reference to 1533?

A It does.

Q Continuing on 1535 through 1538, can you tell me whether or not 1535 through 1538 in the original form before you are ribbon, from a typewriter?

A They are ribbon.

Q Are 1522 through 1532 from the ribbon typewriter?

A No. They are ribbon.

Q Do those numbers 1522 through 1532 and 1535 through 1538 predate Exhibit 455?

A They do.

Q Would you look at Exhibits 1539, 40 and 41?

A Those are carboned copies.

Q Do those predate Exhibit 455?

A They do.

Q Would you turn your attention to 1542 and 1543?

A Well, I am looking at them.

Q We have got some separation in the copy work here.

A I got them before me.

Q Could I take the one you have marked 1544. Is it all right if we go off the record, Mr. Dodds, to make sure which is the front and which is the back?

MR. DODDS: Yes.

(Discussion off the record.)

BY MR. HALLADAY:

Q What is 1542?

A 1542 is part of a laboratory manual in physics.

Q Is it a mimeographed part of a sheet?

A It is originally, yes.

Q Does it have any information on it relevant to the problem at hand?

A It does not.

Q And 1543?

A Same answer.

Q What were these pieces of scratch paper in the file?

A As I look back on the habits of the day, one of them was to keep a lot of junk around, and I am awfully sorry I didn't have a partial fire at that time, I would have saved myself much iniquity at the present moment going through these things. I suppose they have some historical value and they can be collated, but I don't know why those two scraps of paper are in there.

Q Well, do the two scraps of paper state some kind of mathematical problems?

A Sure.

Q Solvable by what process?

A Well, nothing to do with the present one, at any rate,

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nothing more than any problem in physics or chemistry would have to do with the present problem. These were not put in there for that purpose, the fact you could write on the back of them, but they didn't get the back written on them.

Q All right.

A I am sure that's the correct answer.

Q I think you have at least already in general covered 1544 through 1551?

A I have. Yes.

Q Are those in your hand?

A They are in my hand. Yes.

Q And do those predate the manuscript, Exhibit 455?

A They do.

Q Have these documents 1541 through 1551 been in your possession ever since their creation?

A They have.

Q Turning now to 1552, is that the next one in the original file before you?

A Yes, it is.

Q What is that?

A This is some of the material used in the preparation of a contract.

Q Do you know who authored or drafted this two-page document, 1552 and 1553?

A I expect that I authored it myself.

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Q Next is 1554 through 1560, what is that?

A This is a patent agreement. This is a draft copy of a patent agreement.

Q By whom was it drafted?

A It was drafted by me. I hate to disclose the fact here, but I am afraid that is the truth.

Q With reference to 1563?

A What about 1561 or did you want to omit that?

Q I deliberately have gone past it.

A We are past it?

Q Yes.

A Good.

Q 1563, three pages?

A Yes.

Q 1564, 65, 66, 67, 68, 69, do you know whether or not those documents were forwarded to you by some representative of IBM?

A They were so forwarded.

Q Is that true also with reference to 1570, three pages?

A 15 what now?

Q 1570, comprised of three pages?

A That also was forwarded to me by some representative of International Business Machines Corporation.

Q 1571, an eight-page document, from what source did

you obtain that?

A That was obtained from the Iowa State College, or more precisely, from the Iowa State College Research Foundation.

KL-72
16/1/1/72
WS#16/1

Q Approximately when did you obtain it?

A Approximately the dates in question, probably 1940, '41 or some such time as that.

Q What are documents numbered 1572 through 1574 -- excuse me, 1573?

A That's a draft of the contract.

Q By whom drafted?

A Drafted by me. You understand, somebody else may have given me a basis for that draft. I am not saying it was entirely original with me.

Q Is that an original typing from a ribbon or a carbon, 1572, 73?

A 72, 73 is an original carbon copy.

Q Pardon?

A I am sorry, original ribbon copy.

Q 1574 is what?

A A carbon copy.

Q 1575?

A Is a ribbon copy.

Q 76?

A Carbon copy.

Q 77?

A Ribbon copy.

Q Have all of these documents 1572 through 77 been in your possession since approximately April, 1941?

16/1/2/73

A I think that would be approximately right.

Q I observe on 1572 at the top reference to the blank day of April, 1941.

A Yes, that is approximately the time.

Q 1578 through 1611 is clipped together in the copies with which I am working and I believe Mr. Dodds' also.

A Let's take off the following first pages.

Q Let's do what?

A Let's take off the following pages. Let's talk about 1578 to 1594.

Q All right, sir.

A I will remove those. Now, these pages --

Q Let me ask you this question. Are the pages 1578 through 1594 in your file by virtue of some kind of reproduction process?

A They are, and they have been entered therein recently.

Q All right. With reference to 1595 through 1611.

A This material is again part of the process of perfecting a manuscript which took place in July and August of 1940.

Q Well, are pages 1578 --

A 1578?

Q Yes, the next preceding set, pages 1578 through 1594 machine reproductions of pages 1595 through 1611?

A They are. I did not notice that.

Q Then with respect to pages 1595 through 1611 --

A 1595 through 1611 --

Q Those were prepared when?

A Those were prepared at the time in question, during June, July and August -- I don't know, July and August of 1940.

Q Has the manuscript part or draft reflected in 1595 through 1611 been in your possession ever since it was prepared?

A They have.

Q In the copy work that was done, Dr. Atanasoff, we found a document number 1611 -- 1612, a handwritten note.

A Yes.

Q Have you the original of that in your hand?

A I have the note.

Q Is that something from the person who helped you compile and collect and number these files?

A Bless me, these files were hurriedly collected and represented a rush, and how that got in there, I do not know, but it got in there and I decided I had better leave it in the original file because it's in the other file. Bless us. It was written, fortunately, by my wife.

Q And in any event, does this have something to do with transmitting these documents to you so you could have

16/1/4/75

them for this proceeding?

A Well, yes. She was working on them and she got this call from the dentist.

Q All right. Since we are preserving things for posterity, we will leave it where it is.

1613, what is that?

A 1613 is a published paper published by J. V. Atanasoff and A. E. Brandt, Iowa State College, Ames, Iowa. Received for publication November 20, 1935, and it relates to the subject "Application of Punched Card Equipment to the Analysis of Complex Spectra."

Q Was this article, to your own personal knowledge, published in the journal which you have named?

A It was.

Q And is this a reprint of that actual publication?

A Received from the publication.

Q Has it been in your possession since approximately February, 1936?

A Yes, I would say so.

Q Document No. 1614, what is that?

A This is a publication of mine in the Physical Review, pages 1232 to 1242, Volume 36, No. 7, October 1, 1930. It constitutes a publication of my Ph.D. thesis.

Q Was it in fact published, to your knowledge, in that periodical?

16/1/5/76

A It was.

Q Is this document in your original file numbered 1614 a reprint of the original publication?

A It was.

Q No. 1615, what is that?

A This is a reprint of a paper by Mr. Charles Pence Wells, a professor of mathematics at the Michigan State college. It was published in the Iowa State College Journal of Science =- and that is the name I wanted yesterday -- volume 12, No. 1, October, 1937, pages 37 to 42, and it represented his thesis submitted to the graduate faculty of Iowa State College in partial fulfillment of requirements for the degree of philosophy, Doctor of Philosophy.

W-16-2

Q Was Dr. Wells a professor at Michigan --

A Michigan State.

Q -- at the time of this article?

A No. He was a student at Iowa State University.

Q Was this in fact printed in the publication you have named?

A It was so printed.

Q Is this a reprint of it?

A It is.

Q 1616, what is that?

A This is a publication by J. V. Atanasoff and H. L. Wilcke. It is reprinted from the Journal of Agricultural Research, Volume 54, No. 9, Washington, D.C., May 1, 1937, pages 701 to 709. The title of this article is "Measurement of the Viscosity of Eggs by the Use of a Torsion Pendulum."

Q Is this a reprint of the original publication?

A It is.

Q Has it been in your possession since the date of its issue?

A It has.

Q No. 1617?

A 1617 is a reprint from the Geological Society of America, Volume 6, pages 807 to 882, May, 1949.

Q Does this publication reflect any work by you?

A As a matter of fact, it reflects a great deal of work by me, in spite of the fact that my name -- I was the supervisor of the gentlemen whose names appear thereon at the time that this work was prepared.

Q Do you have a reprint of the original publication as a part of your permanent file?

A I have one here. I have some others.

Q 1618, what is that?

A 1618 represents work done really by myself, by Glenn Murphy, who is professor of Atomic Energy at the Iowa State University and by another gentleman whose name does not appear hereon, named Mr. Lynn Hannum, H-a-n-n-u-m. This was done under the auspices of the Iowa Engineering Experiment Station at Iowa State College. It was then Iowa State College, and represents original work.

Q I notice that on the cover of No. 1618 there is a date, 1949. Was that the date of the publication of this particular work?

A That was the date when this particular document was published, but most of the work reported herein was done some years earlier, namely, in the interval between 1939 and 1942. I don't know exactly, but it would be easy to verify because this will be contained in a thesis by Mr. Lynn Hannum which is on file at Iowa State

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University.

Q Did you have a hand in the construction of the device described in No. 1618?

A I did.

Q Called what?

A Laplaciometer. This is part of my program for attempting mechanical solutions of differential equasions which ultimately turned me toward digital methods.

Q Was the Laplaciometer a difficult approach?

A It was an analog approach. This was during my analog phase.

Q 1619?

A 1619.

Q What is that?

A This is a reprint from the Iowa State College Journal of Science, Volume 16, No. 1, October, 1941, pages 140 to 144. It represents a thesis by Mr.Charles J. Thorne. The title is "The Approximate Solution of Linear Differential Equasions by the Use of Functionals." You can see the mathematics developing therein.

Q Is this a printed reproduction of Mr. Thorne's thesis that led to one of his degrees?

A It is, and this is the thesis that led to the doctor's degree, I believe. 1619 is a reprint of the thesis which led to the doctor's degree.

Q Is that the same as Exhibit R?

A No. This is Gross. The other one is Thorne.

Q These are both Gross?

A Those are both Gross, yes.

Q Is the work reflected in 1619 in the same frame of reference or a different one than that of Dr. Gross?

A Well, there are a great many similarities. The details differ, you see. We will look in there. I believe we have a solution of a plate, of a problem. Here it's more, in this thesis there was a solution of an original solution of an elastic plate. Gross' theses were most of a theoretical nature, intended to derive the original mathematical methods and Thorne had an application here, although there is theory in Thorne's thesis, too.

17/1/67
A KL

Q How would you say these theses illustrate, if at all, the difficulties involved in solving the problems reflected?

A Well, I guess you could get evidence from either Mr. Gross or Mr. Thorne that these problems were rapidly getting extremely hairy.

Q Getting what?

A Rapidly getting extremely hairy, extremely difficult I should say for the record, as one attempts to extend the solutions. So there isn't any question about it, I guess you just have to try it once and there won't be any question in your mind.

Q Was 1619 in fact published in the publication you have described?

A It was.

Q 1620?

A 1620 is also published in the same publication. It is a reprint from volume 16, No. 4, July, 1940, pages 333 to 343.

Q Were you coauthor?

A I was coauthor of this publication.

Q This is again a reprint?

A It is a reprint of material published in that publication, and I have had this reprint in my possession ever since the date thereof. It is easy to verify these

17/2/68

publications by going to the files of this Journal.

Q 1621, what's that?

A 1621 is an article relating to another problem in physics. It is a reprint from the Phsical Review, Volume 59, No. 1, 85 to 89, January 1, 1941. The title is, "Dynamical Determination Of the Elastic Constants and Their Temperature Coefficients For Quartz."

Q Was this a reprint of the article as published in the Physical Review?

A It is.

Q Has it been in your possession since the date?

A Yes.

MR. HALLADAY: It's now 5:15, would this be appropriate?

THE WITNESS: Why don't we finish that last letter in here?

MR. HALLADAY: I have covered it as far as I want to go.

THE WITNESS: Let's do that.

(Whereupon, an adjournment was taken until 9:15 o'clock a.m., November 15, 1968.)

1/15/68
EA#1
vL=1

VOLUME V

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

Honeywell, Inc., Plaintiff,	:	
-vs-	:	4-67 Civ. 138
Sperry Rand Corporation and Illinois Scientific Developments, Inc., Defendants.	:	

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 9:30 o'clock a.m., November 15, 1968.

(Appearances as heretofore noted.)

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November 15, 1968
9:30 o'clock a.m.

Whereupon,

JOHN V. ATANASOFF,

having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

BY MR. HALLADAY:

Q I guess we are ready. Dr. Atanasoff, I put before you from your original files folders marked so as to reflect Atanasoff Deposition Exhibits F-1-A, F-1-B, F-1-C, F-1-D, F-2, F-3, F-4, F-5 and F-6 according to the modified identifications of those folders as we finally rearranged them yesterday, and as I have been saying what I have been saying, did you follow with me through at least the folders to see to it that those folders that I did specify are in fact before you at this time?

A They are.

Q And then subject to the possibility of something having inadvertently slipped out in the process of packaging and repackaging these exhibits, can we until we find such a thing has happened, assume that those exhibits folders contain the serially identified individual documents or groups of documents that we have heretofore established by such serial numbers and have read one way or another into this record?

k3

A I am sure they do.

Q All right. Then if you would, please, direct your attention to the general area of questioning that related to the building of the prototype that had been the subject of your testimony previously. Will you tell me that you will do that?

A I will.

W-2

Q And I am asking you now to take your mind back to the period of time during which you and Mr. Clifford Berry engaged in the building of that prototype. Will you do so?

A I will.

Q Without reference to any of the documents before you, can you fix for the record and for the purpose of establishing a period of time for the purpose of further following questions, when it was that Mr. Berry and you together embarked upon the building of what you have called the prototype?

A The exact date is not known to me. It was in the fall, in September of 1939.

Q And I believe you have heretofore said, but just because my record, myrecollection and notes are unclear, is Mr. Berry still alive?

A Mr. Berry is deceased.

Q And can you tell us about when it was that he died?

A He died in 1963, and I believe the month was December.

Q Now, you have already described, and I don't want to repeat it, in a general way, at least, the work which was done in the building of the prototype and you have made a previous reference to the testing of the prototype. I would like to ask you generally, however. Yesterday you reviewed

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with us in Atanasoff Deposition Exhibits H-1 and H-2, the originals of which are also present here in the room, the various documents which were produced during projects 41 and 35 and identified by Exhibit Nos. 1000 through 1224 and 1300 through 1304, if you will recall.

A I do not recall, but I will verify it if you wish.

Q Well, I am referring now to the general financial files that were contained in Exhibits H-1 and H-2, just so that you will have this thought in mind. Will you check to see that those are present here?

A The material is before me. What numbers did you state, sir?

Q 1000 through 1224 in Exhibit H-1.

A Correct.

Q And 1300 through 1304 in Exhibit H-2.

A Correct.

Q During the pursuit of the activities in the fall of 1939 that led to the building of the prototype, you have also earlier said that you engaged in activities which contemplated work beyond the prototype, have you?

A I have so stated.

Q Now, are there included in the financial documents to be found in Exhibits H-1 and H-2, vouchers, invoices and other recorded information reflecting the acquisition of parts and supplies or components or other elements that

were utilized in the building of the prototype and thereafter in the building of another machine?

A Is there a question before me?

Q Yes.

A I didn't understand it, I am sorry.

MR. HALLADAY: Would you read it, Mr. Sutfin, please?

(The question was read.)

MR. DODDS: Objected on the ground that it is leading.

BY MR. HALLADAY:

Q You may answer.

A The answer is yes.

Q During the time that you were engaged in these projects 41 and 35, did you have a practice or habit with respect to the timing at which you acquired various and sundry parts or components, supplies or materials pertaining to the prototype or the machine that was later built?

MR. DODDS: Objected to as leading.

THE WITNESS: I had certain habits, yes.

BY MR. HALLADAY:

Q Would you describe them?

A My habit was to proceed as rapidly as possible and to be reasonably optimistic in my view of the projects which

I was doing and make arrangements to get ahead with the next phase of it while I was finishing one phase. As a matter of fact, in the conditions of University life with meager facilities, such habits are almost necessary.

Q And in specific reference to the timing of the acquisition of such things as motors or vacuum tubes or condensers or parts of the frame or items of this sort, what, if any, practice did you follow in acquiring such items?

A Well, I remember one facetious remark by somebody. Somebody said, "Atanasoff is building a frame and he doesn't know what he is going to put in it."

Q When was that?

A That was some time in the fall or early winter, the fall of '39 or in January.

Q Of what year?

A Of '40.

Q What frame was then in the process of construction?

A The framework which contained the ultimate machine.

Q Did you follow any habit or practice during the projects 41 or 35 of acquiring an inventory of parts, components, tubes, elements or supplies in advance of the date upon which they were actually to be used in the construction of the machine or machines in question?

MR. DODDS: Objected to as leading.

end

KL=4
EA 3/1/1/4

BY MR. HALLADAY:

Q You understand the question?

A I believe I do, yes. You see the word inventory is slightly obscure to me. I would say this which I think may cover the question. That my inventories were closely geared to what I knew were the necessities of the project. I couldn't afford an inventory in the ordinary sense, a free inventory of material. It was not available and I could not afford it, but on the other hand, I tried to be foresighted in what would be needed and procure that as rapidly as possible.

Q Do the financial documents contained in Exhibit H-1 reflect the orders, shipments, deliveries and billings from time to time of the components, parts, pieces, elements and related items employed in these respective projects 41 and 35?

MR. DODDS: Objected to as leading. And I want to state on the record again that if this persisting leading examination of the witness continues, defendants will be forced to move to strike from the deposition if and when offered all answers responding to such leading questions.

BY MR. HALLADAY:

Q You may answer?

A Please read the question.

(The question was read.)

k-5
P.2

THE WITNESS: Answer yes.

BY MR. HALLADAY:

Q Directing your attention to the prototype, would you now turn your attention to the contents of Exhibit F-1-A which you have before you?

A (Witness complies)

Q And locate therein if you would, please, Exhibit 439. I am sorry, F-1-A, I am awfully sorry, Dr. Atanasoff. F-2.

A And what number?

Q 439.

A I have the document before me.

Q In whose hand is that?

A That is in my hand.

Q When was that document written up?

A The date hereon is December 15, 1939. That is the correct date I believe.

Q As Of December 15, 1939, can you tell the Court the then condition of the prototype?

A As of December 15, 1939, the prototype had accomplished its purpose. It had demonstrated to me that my fears that a computing machine employing vacuum tubes would not work were groundless, that such devices would work.

Q Well, as of that time, can you give the Court a verbal description of the appearance and condition of the

3/1/3/6

prototype?

A The prototype was housed on a table in a room in the basement of the physics building. It was -- the structure of the instrument itself did not extend to the floor. It consisted of -- perhaps the most noticeable feature of the machine was a bakelite disc perhaps ten inches in diameter on either side of which were a circle of condensers, but these circles were incomplete. This disc is mounted on what is called the slow speed shaft. At right angles to the slow speed shaft was the high speed shaft. The high speed shaft was geared to the slow speed shaft. The high speed shaft had commentators thereon to serve two purposes, for boosting and again for carrying. To the side on a chassis of then standard character was structured the add-subtract mechanism. Another chassis carried the regenerative circuits for what is later and what was not at that instant called the KA condenser bank.

Another chassis contained the power supply furnishing filament current and voltages principally, plus 110 and minus 110 volts for the other chassis and there was attached to it a cord which could be plugged into a power source in the wall.

Operating this way I might have left something cut. I tried to give a rough feeling for the device.

Q Was there a motor?

A There was a motor which was built into the high

3/1/4/7

speed shaft.

Q As of that time or as of any time, Dr. Atanasoff, do you know of any photographs which were taken of the prototype?

A I don't know of any.

Q Have you made efforts to locate any photograph that might have been taken?

A I made great efforts to locate any photographs, any further photographs which relate to the prototype or any other part of the machine. This is -- no one that I have talked to remembers any photographs of the prototype and I don't either.

Q Do you have any recollection of any photographs having been taken by anybody?

A Of the prototype?

Q Of the prototype.

A That, I am saying that there were none to the best of my knowledge and belief.

Q And you took none?

A I took none, right, and why I don't know.

Q Are there drawings, however, in the files at hand which relate to the prototype?

A Not directly.

Q Are there sketches or notes which relate to the prototype?

3/1/5/8

A Well, the add-subtract mechanism which was used in the prototype varies somewhat from the add-subtract mechanism later used. The later add-subtract mechanism being of simpler character structurally, and there are circuits of this device available in the records.

Q Will you look at Exhibit 440 in Exhibit F-2 and tell us of whose authorship that is?

A Those are drawings and sketches by me.

Q Made on or about what date?

A The date thereon is December 15, 1939, and they were made on that date, I presume.

Q And to what does that drawing relate?

A It relates to contemplated structure of the main machine, not of the prototype.

Q As of that same date, will you look at Exhibit 438, 438?

A Yes.

Q Whose authorship is that?

A That is my authorship.

Q And is that your handwritten date on it?

A That is my handwritten date.

Q Was that date put on that document number 438 by you on December 15, 1939 --

MR. DODDS: Objected to --

3/1/6/9

BY MR. HALLADAY:

Q Or on some other date?

A I am -- I use dates for a purpose, and I haven't been trying to fool myself all these many years, and so I must declare that that date was put on that document on that date, barring possible lapse of memory as to the exact day on which the date was inscribed.

Q And to what does Exhibit 438 relate?

A 438 relates to the main machine, not the prototype.

Q When we say main machine, just for --

3/2/

A That is the machine --

Q -- for further identification, may I ask this question. Is the main machine the subject of one or another of the photographs that you discussed yesterday?

A I believe all the photographs supplied yesterday with possible exceptions or lapse of memory related to the main machine, and this machine was begun about the first of the year 1940, and we have a photograph that is dated as late as, as late as '42, I believe it's May, but I don't remember for sure.

Q All right. Then will you look at Exhibit 441 in Exhibit F-2 that you have before you?

A 441.

Q Yes. Now, in the original file that you have before you, tell us whether or not Exhibit 441 is physically

3/1/10

next to Exhibit 440, 439, 438 as assembled presently?

A They are a unit as assembled and they were produced more or less at the same time.

Q Does Exhibit 441 have a date on it?

A It does not have a date on it, I believe. I looked but I will look again. No date is inscribed on 441.

Q With respect to the physical paper on which 441 is written, can you describe whether that paper has the same or different appearance from Exhibit 438?

A They all seem to have the same paper.

Q And tell us whether or not the original papers which you hold in your hand do or do not show rust marks?

A They show rust marks of a paper clip, not the present one.

W-4-1

Q Can you tell us now, according to your best memory, then, approximately when 441 was written?

A I am personally sure that this material was written in December of 1939.

Q Is 441 in your hand or in the hand of someone else?

A 441 is in my hand.

Q How about 442?

A 442 is in my hand, also.

Q Now, do you observe on 442 there is writing in the lower right-hand corner?

A There is.

Q In whose hand is that writing?

A That note is in Clifford Berry's handwriting.

Q And do you observe a date on 442?

A I observe the date of November 7, 1939.

Q Do you know when Mr. Berry put that note on what is now 442?

A Well, I have no doubt it was on the date therein inscribed, thereon inscribed.

Q Look at Exhibit 443, please. What is that?

A What is it? It's a sheet of paper with the circuits drawn thereon.

Q Do you know who drew those circuits?

A They are in my hand.

Q Is there also a note on this Exhibit 443 in someone

else's hand?

A There is.

Q In whose hand?

A That is in the hand of Clifford Berry.

Q Do you have a recollection of when that note was put on Exhibit 443 by Mr. Berry?

A Mr. Berry was a serious man and he was in the habit of employing the date, the current date in dating objects, and I am sure because of that and for no other reason that that date was put on there by Mr. Berry on November 7, 1939. I have no independent recollection of that date.

Q Do you have any recollection that Mr. Berry at any later date went back into your files and put dates on documents in your files?

A He wouldn't have thought of it.

Q Do you have any knowledge of him having done so?

A On no occasion.

Q What is the purport of the circuit shown in the diagram on 443?

A 443 is a diagram which is a logic circuit for a proposed computing machine.

Q What part of the logic circuit, if you can say from an inspection of Exhibit 443?

A The logic circuit is the part that observes

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this and observes that, works out the problem and gives an answer, and that is the circuit contained hereon.

Q You have heretofore spoken of the add-subtract mechanism and also of a vacuum tube circuit that performed a so-called memory jogging function?

A This is not the memory jogging circuit. This is the add-subtract mechanism or the logic circuit. I haven't called -- I have never on any occasion called the memory jogging circuit a logic circuit. It could be called without undue stretch of the imagination of the meaning of the word, it could be called a logic circuit because it performs a very simple elemental item of logic.

Q When you use the term in your testimony logic circuit, then, is it your intention that it referred to the add-subtract mechanism part of the machine in question?

A Yes, and I didn't understand your question or I would have answered so. And if I may, if no one objects, I will use the word logic circuit and add-subtract mechanism interchangeably in my testimony.

Q Then on the diagram Exhibit 443, there are circular objects appearing. Is that some form of a conventional representation of an object?

A That is a conventional representation of a vacuum tube.

Q What kind of a vacuum tube?

A Well, you will see on there triodes and what look like four element tubes. As a practical matter even in that day four element tubes were not very current and they were five element tubes, but we just, and we just in a casual way omit the fifth element. They were in effect, we never used any five element tubes. They were always pentodes.

Q That being a term --

A Five element tubes.

Q That being a term for a --

A Type of vacuum tube which contains five elements.

Q And the term for containing three was what?

A Triode.

Q Which of those was the 6C8G, if that is the term?

A That is the triode, but it is a double triode in a single envelope. Here you see the elements being depicted separately. Thatis customary, but when you come to the actual building, sometimes it's advantageous and cheaper and more compact to employ envelopes which contain two triodes or multiple tubes, multiple electronic components in one envelope.

Q Multiple?

A Yes. You will see, it's gone a long ways today, this trend.

Q It's just a matter of my not understanding the word

you use. You said multiple?

A Yes. I didn't employ anything except dual triodes in this circuit, and also here we have before us a circuit containing pentodes which were not dual. Now, for instance, if you look at the two tubes, the two vacuum tubes depicted in the upper left-hand corner, standing one close by a letter B and one close by a letter C, those two tubes, two vacuum tubes depicted in the upper left-hand corner, standing close, one by a letter B and one close by a letter C, those two tubes, perhaps, I don't declare, but perhaps were contained in a single envelope.

Q And when you say a single envelope, --

A I mean a single glass envelope which is evacuated and which permits the elements to function therein.

Q Did Exhibit 443 pertain to the prototype or to the main machine?

A That pertained to the prototype.

Q How many vacuum tubes were employed on the prototype? When I say tubes, I am thinking of the glass tubes without regard to whether --

A Glass envelopes.

Q -- they contain two or more elements.

A You should say glass envelopes, if I may advise counsel.

Q All right. Thank you.

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A There were eight, I believe, envelopes on the logic, in the logic circuit of the prototype, if I may be more specific.

Q And those eight envelopes would be identified by what designation?

A Counsel must --

Q Were they 6C8G's?

A Oh, no, they were not.

Q What were they?

A I believe that the prototype contained 6F8G's, which is another dual triode and that the transition to the 6C8G's occurred at this juncture between the prototype and the main machine, and it also contained some pentodes, and some way my mind fails me on the designation of the pentodes. I ought to remember it, but I don't.

Q Were the pentodes that were employed on the main machine the same tube that was employed on the prototype?

A Were the pentodes that were employed on the main machine the same tube that was employed on the prototype? There were no pentodes employed on the main machine. Well, to the best of my knowledge and belief, there were none. There might have been one in the power control circuit. I am slightly uncertain there, but otherwise, there were no pentodes employed on the main machine.

Q Then will you look at Exhibit 444?

7

A I have it before me.

Q Now, is that on the same kind of paper or a different kind of paper as the preceding exhibits 438 through 443?

A Same kind of paper.

Q Whose hand is on Exhibit 444?

A The main part of that exhibit is in my hand.

Q Does it have a writing by someone other than you?

A It has a "recd. November 7, 1939," by C. E. Berry thereon in his handwriting.

Q Directing your attention to Exhibits 442, 443 and 444, the three pages --

A Right.

Q -- will you tell us whether or not those pages are numbered at the top?

A They are so numbered.

Q And directing your attention --

A Wait a minute.

Q Excuse me.

A Wait a minute. Yes, they are so numbered.

Q Numbered what?

A 1, 2 and 3.

Q Directing your attention to Exhibit 444, the portion thereof that you have written, what is the purport of the

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writing?

A The purport of the writing is an armchair experiment to delineate the operation of the logic circuit.

Q Can you explain that delineation?

A Not in too much detail without spending a few minutes on it. I don't know whether the Court would desire that. I probably could do it in, with 30 minutes careful study there. I could go through the thing again.

Q Can you give us a summary of what that armchair work was?

A Oh, yes.

Q Would you do so, please?

A Now, you see A, B and C at the upper left of the input terminals of the machine. We are considering a single base two addition or subtraction, as the case may be. By following A, B, C, do you see add and subtract? Now, if the digits occurred as indicated at the left there on that diagram, why then, you see depicted at the right the number that must be ascribed at the bottom of the sum and the number that must be carried into the next place -- no, I am sorry -- yes. You see two digits below add and two digits below subtract. The right-hand digit is the one that should be inscribed in that place, I believe. And the left-hand digit -- I can easily

verify that, yes -- and the left-hand digit is the one that would be carried into the next place in doing the sum. I could illustrate with writing, if you wish.

Q What I am interested in at this point is not more writing, but simply more discussion from you as to what the general purport is of this document.

A All right. Now, you see here, having thus shown the input on the left-hand side, and then you see the desired results. Consider the left-hand vertical line. To the left of that line are contained the inputs and the results to be obtained when the machine, when the logic circuit is subtracting, and the results to be obtained when the logic circuit is adding. Now --

Q Excuse me.

A Pardon?

Q Excuse me. When you use the term input under column headed D and the figure is 60, is that one of the points to which you are referring?

A I did not use it in connection with column D. I only used it to the left of the first vertical line, to the left of the left-hand vertical line.

Q All right.

A Now, let's make sure we get that first. Now--

Q Excuse me, Dr. Atanasoff, and I am sorry about the laboring that I am doing here.

A All right.

Q I am trying to get some identification of the numbering system here for further understanding of the document itself. With respect to the columns to the left of the first vertical line on Exhibit 444 --

A Yes, sir.

Q -- the figures represented thereon are zero's or one's?

A Yes.

Q With respect to the column D to the right of the first vertical line, the figures are 60, 90, 120, 60, 90, 120, reading down below D. Now, are you following what I am referring to?

A I am.

Q Now, all I want at the present time is identification of the significance of the zero's and one's in the columns to the left of the first vertical line and the meaning of the figures 60, 90 and 120 respectively in column D to the immediate right of the first vertical line.

A Now, it is clear that the numbers at the left of the first vertical line relate to the digits zero and one of the base two number system. If there is a one there, for instance, as there is in the second line on B or C, and B and C are concluded -- are included in a

single bracket -- I am sorry -- but those two lines are included in a single bracket because either on addition or subtraction, it doesn't make any difference whether the digit is one on B and zero on C or zero on B and one on C. Do you notice that? That's the reason they are so included in a bracket there, and likewise below, you see a similar inclusion.

Now, the number zero on A is presumed continued downward so that all future lines have the number zero included there, and in the second group of numbers, the number one is, you could imagine ditto marks placed below it, showing that there is a one for A in each of the successive positions. These are efforts to abbreviate the diagram.

Now, as to what 60, 90 and 120 means I am slightly hazy, but I have not much doubt that it means -- you see there at the top is a letter D. I believe if we would refer to 443 we would find something called D and D is a common point of two leads from two plates. I think what you are seeing there is an armchair estimate of the voltage at the point D in the circuit. Now --

KL=17
4/3/i/17

Q And where we see other figures in the columns further to the right of 20120, 40, 15, do you know whether or not those are references also to voltages?

A Now, I am sure they are all voltages, but I might call your attention also to columns E and F which contain letters. They contain the letters L and H and L and H stand for low and high, and I believe low means 60 and I believe high means 120. No, my notes seem to show that low means 40 here. Well, that is just a difference --

Q Did you misread?

A What's that?

Q Did you misread?

A Do you see -- do you see on your diagram some faint numbers there to the right of H and L in the upper half of this diagram under E? Do they show on your diagram?

Q They do.

A Okay. Now, that meant that this armchair experiment was being conducted on this logical basis, that when the tube was cut off that we had a plate supply of 120 volts, so that when that tube was cut off the value of the plate would rise to 120 volts, and when the tube was cut on, it would fall to 40 volts. We must have had some basis for that particular tube. Remember that E there -- let's see what E is. I want to see --

Q Are you referring to 443?

:=3/2/18

A I am referring to 443, and 443 is a 6F8G. Now, I said 60. I wasn't sure of 60. It could have been 50, but I was -- there was a temporary lapse of memory in my reasoning. When it comes to 6F8G the swarm of electrons is much more intense than it is in the 6C8G, so this swarm of electrons is capable of transmitting more current and pulling the voltage of the plate downward more, so 40 is a reasonable answer. This justhas to do -- it really doesn't make any difference. It's all working and working fine for the purpose at hand, and it would work if it was 50 and it would work if it was 60, but actually, I believe this 6F8G would fall to 40 under these circumstances if you had 120 volts on this plate.

Q Down below on Exhibit 444 there is a bracket with the letter H equals 120 and L equals 50.

A Such are the vagaries of human effort. I -- that shows you that there is a slight contradiction of the very faint enumeration above, so in this case we have estimated 120 volts for the high voltage and 50 volts for low voltage. That perhaps is a good answer, too.

Q Further to the right on Exhibit 444 are other numerals, 60, 70, 35, 95, 135, 175, 155, 160, 70, 180. I may not have read all of them, but I have simply sampled some of them solely to ask you whether those refer to voltages or something else?

4/3/3/19

A They do refer to voltages.

Q Will you turn to Exhibit 445, please?

A I have before 445.

Q In whose hand is that?

A That is in my hand.

Q And to what does that refer?

A This sheet is extraneous to the subject matter of the present.

Q To what does it refer?

A It refers to part of the work done by Willson or some of his successors on crystals.

W-4-4

Q Is there a conventional symbol for crystal on it?

A Yes. Do you see a the top there that little square between two plates. That is a dead giveaway, but I also have a dead giveaway because we have an oscillating circuit to the left instead of the circuit that is customarily employed in computing machines.

Q Is the symbolt on Exhibit 445 that conventionally represents a crystal, near to a number?

A It is near the number 1852.

Q And then down below the drawing or diagram, is there some identification of a tube?

A Will you point to it on yours? I do not know what you mean. Oh, yes, it says 6F8G there.

Q Did you employ 6F8G tubes in connection with the crystal testing devices that you have described earlier in your testimony?

A I simply do not know. We did employ 617's, and we employed, as I remember now, and this circuit refreshes my memory, I was telling you about a buffer amplifier as I was explaining this research the other day, I had a rough diagram there and I said there is a buffer amplifier. You will notice that this is a push-pull buffer amplifier which stands in between employing pentodes so as to get a relatively high voltage on the crystal circuit.

Q Now, does Exhibit 448 -- excuse me -- 445 refer in

any way to the drawing which you put on the board the other day?

A It does.

5 1/1/11
A KL

Q Which has been marked Atanasoff Exhibit N?

A Right. May I help?

Q I think if we get all of us up there it won't help anybody. Excuse me. I am going to move this camera over there. Excuse me.

A Now, you must --

Q Excuse me just a moment. All that I would like to do at this point, Dr. Atanasoff, is, by referring to Exhibit 445 and in turn to Exhibit N which we have before us, to have you state what part of Exhibit N corresponds, if any, to what part of Exhibit 445. Can you tell us that in words?

A I can.

Q Would you do so, please?

A The first tube that is the symbol for the tube in 445 in the upper left corresponds to the oscillator here.

Q On Exhibit N?

A On Exhibit N. The pair of tubes which comes next to the right --

Q On 445?

A On 445. Correspond to the buffer block diagram. You understand this is a block diagram. It isn't supposed to be connected right, it's just supposed to suggest function.

Q All right. When you say this, you mean Exhibit N?

A Right. That is a more direct circuit diagram.

Q Which?

5/1/2/12

A That one, the diagram contained in 0445. Now, you will see the crystal to the right of the buffer in that, in diagram 445, and also in Exhibit N here, and then you will see another arrangement out at the right-hand side 6L7 there serving the function of the detector in Exhibit N. Now, in order to get relatively high voltages and good amplifications we have used, and a balanced circuit, we have used two tubes in the buffer in 445 and there is nothing wrong with having two tubes inside of a block diagram as indicated in N here. This is a kind of thinking people do about such things. You notice there are items missing from that diagram.

Q Which?

A The Miller effect tube is not shown there.

Q Excuse me. Again we have record problems. The Miller effect --

A The Miller effect tube is not shown in 445 but it is shown in Exhibit N and the cathode-ray tube is not shown in 445 but it is in, it is indicated in N.

Q All right, sir. Would you resume your seat, please. Do you have any way, Dr. Atanasoff, of fixing a date for Exhibit 445?

A I do not.

Q Now, we have already, I think, established that the reverse of 445 is extraneous, and if we haven't, may I ask you if it is?

5/1/3/13

A It is extraneous but it's not exactly extraneous to the material on the other side thereof.

Q All right. Does the material on the reverse of 445 relate in some way to this quartz crystal testing you have described?

A It does so relate. I find by a cursory examination of same it does relate.

Q Will you turn to Exhibit 446 -- excuse me. Is the typing on the reverse of 445 from a ribbon or some kind of a reproduction or carbon or what is it, by appearance?

A I believe it is a ribbon copy.

Q And do you recognize it as of your authorship or the authorship of somebody else?

A I don't know. This -- the authorship of this?

Q Yes.

A It is either mine or it is that of a man by the name of -- now, you understand I can see here that this is not the work of Hart --

Q Not the word of?

A I am sorry, of Willson, not the work of his successor named Hart, but is the work of his second successor. Well, my mind fails me here, and he is a graduate student of mine, got a Ph.D. and now works at the Naval Research Laboratory. I will get his name in a moment, but I can't get it under the pressures and exigencies of this court.

5/1/4/14

Q Kammer?

A Kammer is correct. Thank you.

Q Do you know whether or not the typing on the reverse side of Exhibit 445 has any connection with a thesis?

A Yes, it does.

Q Whose thesis?

A Kammer's thesis.

Q Will you look at Exhibit 446. Can you identify whose work that is?

A That is in my hand.

Q To what does that relate if you can tell?

A I cannot tell.

Q What are the circular representations on it?

A Well, one of them says, "coil," another one obviously was designed for a vacuum tube and my mind was not doing very well or I wasn't finishing it up. I was thinking about it. I don't know. I did it, but I don't know what it is. And on the reverse side thereof is further material from the writings of myself or of Kammer. Probably Kammer.

Q Is there any way of fixing the vintage of Exhibits 445 and 446?

A The vintage of that would be during the writing of Kammer's thesis, and Kammer was the last of my graduate students, and he was there during the years when the rest of the material here was collected, '39 or '40, so that would

5/1/5/15

be about the vintage, but I can't give the exact date. I might tell you furthermore that I now remember, it now comes back to mind after reading the backs of these pages and in regard to 445, that this was a refined circuit for a, you know, it's a balance circuit, you know that decides the crystal at the top, the crystal at the top is balanced by variable condensers at the bottom and this produces Lissajous figures of a slightly different character because this is a push-pull buffer stage, push-pull buffer stage and you notice that the upper circuit goes through the crystal but the bottom circuit goes through a condenser and this is with a purpose of balancing the capacitative effects of the crystal out so one can get slightly different physical results, and that was a later refinement, and I now remember that.

Q What are the representations of condensers on the drawing 445?

A Well, they are two parallel plates, but you notice, with wires coming off, two parallel plates with wires coming off, but you notice the representation at the bottom has a sloping arrow through it and this means it's a variable condenser for adjustment purposes.

Q Is there a similar representation to the left on Exhibit 445?

A Yes. There is one for adjusting, there is another

variable condenser there, a symbol of the same kind, another variable condenser there for adjusting the frequency of the oscillating circuit therein.

Q And on 446?

A There is such a symbol.

Q Consisting of what?

A Two parallel plates with a sloping line drawn through them.

Q On the representation for condensers on Exhibit 445, are the parallel lines vertical or horizontal?

A They are vertical on 445 because the circuit is horizontal. They are horizontal on 446 --

Q Excuse me --

A Because the circuit is vertical.

E-5-2

Q Excuse me, Dr. Atanasoff, if you will look at 445, is one convention representation of a condenser with the lines in a vertical position and one representation with them in a horizontal position?

A They are both valid representations. As I was explaining, when the circuit is horizontal the lines will customarily be vertical and when the circuit is vertical the lines will customarily be horizontal.

Q Okay. Will you take the rubber binder off of Exhibit F-1 -- my glasses are bothering me, and I can't read this far away, is it F-1-A?

A F-1-A you desire at this time?

Q Yes, please.

A We are going back to F-1-A.

Q And directing your attention to Exhibit 1443 contained in Exhibit F-1-A about which you have heretofore given some testimony, can you tell us approximately when Exhibit 1443 was made up?

A I imagine in late '41 or during early '42.

Q Does that relate to the main machine or the prototype?

A This relates to the main machine.

Q Are the various objects that are reflected on Exhibit 1443 according to some kind of a convention from place to place?

A Yes. There are conventions employed there. There are also designations which have no relation to convention.

Q Does the lettering on Exhibit 1443 relate in any way to the lettering which we have observed on any of the documents in Exhibit F-2 to which you have been referring?

MR. DODDS: I object to it as leading.

THE WITNESS: Well, you have to lead me more because I don't know what you are saying.

BY MR. HALLADAY:

Q I am just trying to find out if there is any logical correlation or whether there is not between the lettering on Exhibit 1443 which you have before you and such exhibits as 443 which we were earlier reviewing?

A I know where circuits which are remotely related to 443 are contained in 1443 and can suggest same to you.

Q Would you do so, please?

A Those circuits are contained in box B, the box labeled by the letter B.

Q On which of the two exhibits?

A On 1443.

Q And does the armchair logic that you have referred to in 444 relate in any way, or does it not, to the drawing

exhibit 1443?

A Deductions similar to those of 444 may be applied to the logic circuit which is contained in a square labeled B in 1443. This is a rather remote connection but there is a connection there. I think that, I think that this is all one can say to any advantage here.

Q All right, sir.

MR. HALLADAY: We have a drawing that I want to employ at this point. Maybe it would be a good time for a recess while we look at it and arrange to have it marked.

MR. DODDS: Surely.

(Recess taken.)

(Atanasoff Deposition Exhibits T and U marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, I am putting before you Deposition Exhibit F-2 again and will you open that file folder, please, at the beginning?

A I have.

Q And will you look at the very first document which is in it, please?

A 405.

Q Is the number 405?

A It is.

Q Is that document dated?

A It is.

Q Is all or some part of that document in your hand?

A All except a reference signature by Mr. Clifford Berry.

Q To what does this document relate?

A It relates to a circuit diagram for punching cards.

Q Was the document made up on or about the date which it bears?

A It was.

Q And that date is what?

A June 19, 1940.

Q On the back of No. 405 are some additional markings, do you know whose markings those are?

A I don't know. I am not sure.

Q Doyou know to what they related?

A They relate to some elements of a base ten card reading device.

Q Is it possible for you now to give any further explanation of that?

A Well, you can see there a ratchet mechanism of some description and this is when the ideas were in the formative stage, and you can see there a ratchet mechanism for advancing the cards at successive digits of the base ten system are red and you can see there an oblique brush for reading through

the holes in the cards.

Q On Exhibit 406?

A I might add that I have some of those brushes in my possession. These brushes date from that very day. They have been not in my continuous possession since that time but they are in my hands now.

Q Will you turn to Exhibit 406, please?

A I have.

Q And in whose hand is that?

A That is in my hand.

Q The entire exhibit?

A Well, the drawing is in my hand and I believe that the digits below are in -- digits and letters below are in somebody else's hand.

1

KL=20
/1/1/20
WS

Q To what does Exhibit 406 relate?

A These relate to, this drawing relates to a portion of a logic circuit.

Q Is there any way by which you can fix the vintage of Exhibit 406?

A The history?

Q No, its vintage.

A It's age?

Q Approximately when was it done?

A It was early in 1940, but I cannot give a closer estimate.

Q In the upper right-hand corner there is a round appearing object. What is that?

A That is a vacuum tube.

Q Can you identify what kind?

A It is a pentode, probably. It probably was intended to represent a pentode. It doesn't do so completely.

Q And above that is a phrase?

A The phrase is carry pulse.

Q Whose hand?

A That is my hand.

Q Exhibit 407, is that the next one?

A It is.

Q Can you identify whose hand that is in?

A That is in my hand completely.

6/1/2/21

Q To what does Exhibit 407 relate?

A It relates to certain aspects of the logic circuit.

Q Can you fix the approximate date on which this exhibit was written by you?

A It was late in '39 or early in '40.

Q Exhibit 409, in whose hand is that, if you know?

A That is in my hand.

Q To what does it relate?

A It relates to some concepts that I had at the time of the possibility of using the screens of pentodes in connection with logic circuits.

Q Can you fix the approximate date of Exhibit 409?

A It was during the late existence of the prototype or early in 1940, that is, late in '39 or early in '40.

Q Does the original of Exhibit 409 have any holes in it?

A It does.

Q Do you know -- strike that. Did you in the process of doing work during those years keep any notes in a notebook?

A I have never had -- I have occasionally kept a notebook, but almost never, and I don't believe during that time that I did keep a -- a ring notebook, do you mean, or something of that kind?

Q The appearance of the original paper before you with three punched holes in the left-hand margin would suggest, and which don't show up in the copy which I have, suggest that

6/1/3/22

it's a notebook sheet type of paper.

A Doubtless it is a notebook type of paper. I suspect that this was a sheet of paper that was at hand when I got ready to make this drawing, and I doubt if it was ever kept in a notebook.

Q Exhibit 410. Now, in your original file, will you tell me what the serial numbers are of the documents that are physically clipped together by a paper clip that start with 410?

A Well, they are consecutive and they run from 410 to 421, inclusive.

Q And tell us whether or not the paper on which those numbers now appear in your original file is the same or different paper in that sequence from 410 to 421?

A Well, it looks as if, that the sequence is the same from 410 to 418, perhaps, and that 419 and 420 are different paper, or may be. I don't know. I don't know. There are gradual graduations of the paper so that the last sheets seem different from the first, but I am not sure that -- this might be due to exposure, question of exposure, yellowing of the paper due to exposure. I am not an expert on paper.

Q On the documents from 410 through 418, will you observe whether or not there is the appearance of a paper clip marking in the upper left-hand corner?

A . There has been the appearance of a paper clip mark

6/1/4/23

on those documents as if at one time they were separated and now they have been cojoined.

Q And will you now look at the top left-hand corner of Exhibit 419, separating it, if you would, please, from 418 so you can see the upper left-hand corner clearly.

A I do observe that mark.

Q Is there some rust mark in the upper left-hand corner of 419?

A There is.

Q And will you look at 421 and see if there is the appearance of a rusty paper clip in the upper left-hand corner?

A Of the back?

Q Of the back, it would, of course, be the upper right-hand corner.

A Yes. There is none. There are marks of paper clips, but I would ask for cooperation. But I am not sure there is a rusty paper clip there, a rusty mark there.

Q Can you tell by examination of the subject matter of 410 through 420 -- 418, excuse me, if that subject matter relates to that contained on 419 and 420 and 421 or if there is any different in subject matter?

A The subject matter has a degree of continuity.

Q With reference to Exhibits 410 through 418, can you state the approximate -- excuse me. Are those in your hand?

A Those are all in my hand.

6/1/5/24

Q Can you state the approximate date upon which those documents were made up?

A Those documents were written during the year of 1939.

Q With reference to 419, 20 and 21, in whose hand are those?

A Those are in my hand.

Q Can you state the approximate date of that writing on Exhibits 419 through 421?

A They were also written approximately in '39. They might have gone into a month or two of '40, but they were made during '39 or very early in '40.

Q Can you summarize the general purport of these Exhibits 410 through 418?

A I can.

Q Would you do so, please?

A I -- at the time I was slightly acquainted with Boolean algebra, but did not understand it well. I never connected my circuit logic with Boolean algebra in my mind. These pages represent my attempt to find a logical structure for the design of logic circuits. I am not even -- I was able to design logic circuits principally by main strength and awkwardness. How well I succeeded in this algebra I have not reviewed for the purpose of the present representation, and I

6/1/6/25

do not at this moment clearly know. I can review these papers and attempt to remember how well I succeeded. There is no question but what I was able by intuition and by main strength and awkwardness design these logic circuits, but I cannot claim that I recognize the connection of my logic circuits with Boolean algebra with which I was partially acquainted at the time and to which the data contained herein must be related.

Q Do the documents, Exhibits 410 through 418 represent some recordation of your thinking, or what?

A They represent ratiocination of the time, and I am not reading them too freely. I know that's what they are. My memory tells me very clearly that that's what they are. There's no doubt but that's what they are, but I will have to review them with the purpose of reconstructing them before I could make any very definitive remarks for this Court.

Q Would your answer be the same with respect to Exhibits 419, 420 and 421, or would it be different?

A It would be the same.

Q On the back of Exhibit 421 are two words. Are those in your hand?

A They are.

Q Do they have a connection with the information on the face of Exhibits 419, 20 or 21?

A To the best of my knowledge and belief, there is

6/1/7/26

no connection.

Q Were those words written on there contemporaneously with the information written on the face of those exhibits or at another time?

A As far as I know, they were written on contemporaneously.

Q Will you look at Exhibit 422, please?

A I have it before me.

Q Do you know whose authorship that is?

A That is my hand.

Q Can you fix the approximate date of that work?

A That was in 1939 or early 1940.

Q Will you look at 423, please?

A That is also in my hand.

Q In your original file are Exhibits 422 and 423 paper-clipped together presently?

A They were clipped. Evidently the paper clip --

Q My question was, are they presently paper-clipped together?

A They are presently paper-clipped together.

Q Are there any objective signs that they had historically been paper-clipped together?

A Well, there is evidence of a rusty paper clip on the back at the points where there would be rusty marks if they had been paper-clipped together.

6/1/8/27

Q I direct your attention to Exhibit 424. Is that exhibit presently paper-clipped to some other numbered documents? Is it presently paper-clipped to --

A It is.

Q -- to some other? What are the other numbered documents?

A 424, 425 and 426.

Q Does the physical appearance of those numbers 424 through 426 give any evidence that they have previously been paper-clipped together or otherwise fastened together?

A They have been. There is evidence that they had previously been paper-clipped together. I might add to this, my determination to maintain the structure of my files, which may have been violated on rare occasions, but the people handling my files had strict orders to maintain the structure, the original structure, and in the main they have done so.

Q Then do you find a date on 424?

A January 9, 1940.

Q Whose hand is that in?

A That is in the hand of Clifford Berry.

Q Is his signature on that page?

A It is.

Q What if anything can you say about the authorship of the other writing on the page?

A Well, these are explorations relative --

6/1/9/28

Q Excuse me. I am asking only about the authorship of the writing. Whose writings is it?

A I am sorry, so sorry. It is my writing.

6/2 starts

Q There is printing down below on the left hand, in the left-hand corner, hand printing, of Exhibit 424. Do you observe what I am speaking of? The first word that I have in mind to point your attention to is the "more". Do you see that word and then the words following?

A Yes.

Q Can you identify the hand that put those printed words in Exhibit 424?

A All of those printed words at the bottom of the sheet were placed there by my hand.

Q Is there anything on Exhibit 424 in Mr. Berry's hand other than the date and his signature?

A There is not, and incidentally, it appears to me that the date was in my signature, was in my hand.

Q Then as of now by further inspection, what if anything other than Mr. Berry's signature on Exhibit 424 is there that you can identify as being his writing?

A Nothing.

Q And there are references in the box in the right-hand side to certain things. Can you identify what those references are?

A Well, one of the things that plagues you in the

6/10/29

design of computing machines employing vacuum tubes is the great amount of power which they use, and as I wrote that, I was thinking about the power requirements. Now, it says there that there are four 6K6G's. I haven't verified this, but I am sure that if, unless I made an error at that time, that each one requires four-tenths of an ampere of filament current and there are four of them giving one and six-tenths ampere filament current; one 6F8G using six-tenths of an ampere filament current. These, I believe, are all at voltages of 6.3 volts. Now, I know this from memory, and I also know by memory that I was contemplating at that moment employing six -- three 6C8G, each requiring three-tenths of an ampere filament current, and that made me a total of nine-tenths of ampere filament current and an add-subtract mechanism thus requiring a total current of a filament -- let's do the addition again, and it seems right, of 3.1 amperes.

Now, at that moment I was contemplating a machine with 20 units therein, you will notice, and that gives us a kind of a hint that on January 9th our thinking was in terms of 20 units giving a total current of some 60 amperes. Now, that is the way I interpret the material in the box It says current needed there clearly enough.

Q And as to that, the current needed was for what part of your then design?

A Well, this would be the total current needed for all

6/11/30

the add-subtract mechanisms which represented the largest portion of the vacuum tubes needed for this machine, and it contemplated there would only be 30 add-subtract mechanisms in the machine as of this time.

Q Excuse me. I think you misspoke.

A Thirty add-subtract mechanisms in the machine as of this time. Is that what I said?

Q Yes, you said 30, whereas immediately before you had said 20.

A I am sorry, and I must repeat 20 is the correct answer. We ultimately had 30, but at this moment I must have been thinking in terms of 20. This is the way JVA got by with the same frame, you see. He gradually felt how many units he could put in there and then expanded the limit and then they all went in.

Q Turning to 425, please, is that in your hand?

A That is in my hand.

Q Is the date in your hand?

A The date is in my hand.

Q Now, I observe there appears to be some correction in the date?

A Yes.

Q Do you observe that?

A Yes, I do.

6/12/31

Q Who made the correction?

A I imagine I made it. I imagine all of a sudden I became aware that in February 16th I was in '40 instead of '39.

Q To what does exhibit 425 relate?

A Well, I can make a few suggestions. I don't know what the multiplication therein is. I can only guess as to what the 150 per minute might be. I notice that there is a card-handling mechanism, those two rows with a card-handling mechanism, those two rows with a card, horizontal card between it represent a card-handling mechanism there. You see at the top some enumerations, carryover condenser rate, this is a real part of the final machine. Positive throw, I do not know what this implies. Boost, I know exactly what this implies and this applies a principle that was used in the final machine.

E-7-1

Q Will you look at Exhibit 426, please?

A I am looking at Exhibit 426.

Q In whose hand is that?

A That is entirely in my hand.

Q Once again in the upper right-hand corner is there a date?

A Yes.

Q Is the date written in two different or by two different marking devices?

A Well, in the first place, there is a 7 probably corrected to a 6, although it could have been a 6 corrected to a 7 and the next place 1940, but it could possibly be a 46 in place of a 40 and that was interpreted as 1940.

Q Let me ask you this question. At the upper right-hand corner of Exhibit 426, there is a date written in what kind of -- is it written in pencil or pen or what?

A It is written in pencil, the main date is written in pencil.

Q And it now reads as written in pencil, what?

A February 16, 1940, I would read it.

Q With the numeral, following the numerals 194 subject to potential differing interpretations depending on who looks at it?

A Yes.

Q Then below that there is another number, 1940?

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A Right.

Q The number 1940, what kind of a marking device was used to put that on there?

A A pen.

Q Who put it on there?

A I do not know.

Q Do you know when it was put on?

A I do not know.

Q Do you know whether or not the date of this instrument 426 in fact is February 16, 1940 or February 17, 1940?

A I do not as a matter of fact know.

Q Can you determine now by examining Exhibit 426 whether it is the first page which is continued on 425?

A It would seem that this is true.

Q To what does 426 relate?

A 426, I can read the words thereon.

Q Well, don't read it, if you can by referring to it, tell us to what it relates?

A It relates to elements of the design of the computing machine.

Q Which one, the prototype or the main machine, so-called?

A Main machine.

Q Now, Dr. Atanasoff, according to your best recollection, when were 425 and 4256 written?

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A There is no doubt in my mind the date was intended to be February 16, 1940.

MR. DODDS: Excuse me. May I see the original of that?

THE WITNESS: Yes.

MR. DODDS: Thank you.

BY MR. HALLADAY:

Q Will you turn now to Exhibit 427, please?

A I have it before me.

Q Can you tell me what numbers presently are physically clipped to 427 in your file as it is before you?

A 427 to 437 inclusive.

Q Would you be good enough to tell me from inspection of those numbers whether there is an appearance of a rusty paper clip on 427?

A There is such an appearance.

Q And going through them further, do you find any succeeding page which has a rusty paper clip mark on it?

A The only -- there is a slight appearance of a rusty paper clip on the back of 427. It, however, clearly has arisen by penetration of the rust marks through the paper from the front of page 427. There are no other rusty marks until you have arrived at the page 437 which contains a rust mark on the back which is evidence that this group are in their original or are assembled in their original condition.

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Q And then can you tell from Exhibit 427 what the purport of it is?

A The purport of it is something to do with the logic circuit.

Q And can you fix by reference to that document alone its approximate date?

A It's right in the same time, '39 or '40.

Q Referring to No. 428, does that have a date on it?

A It does have a date.

Q In whose hand?

A In my hand.

Q When was that date put on this document?

A Well, the date says June 8, 1939, and I read it and this looks logical.

Q Is your answer that you put it on on or about that date or some later date?

A I am -- I never date things later. I always date them on the instance of the use. I might date them the next day but never later than that. I just don't do things that way.

Q Is Exhibit 427 in your hand, all of it?

A It is.

Q 428?

A Yes.

Q What does 428 relate to?

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A Also relates to elements of the logic circuit.

Q Is 429 in your hand?

A It is.

Q Can you fix the date of that?

A Only by its being adjacent and on the same paper with the previous document, it looks as though, if I had to fix it independently of that contiguity, I would fix it during '39.

Q How about No. 430, in whose hand is that?

A That is in my hand.

Q Can you fix the date of that, approximately?

A The same, 1939.

Q How about 431, in whose hand is that?

A That is in my hand.

Q Can you fix the approximate date of that writing?

A Late 1939 or 1940, perhaps.

Q How about 432, in whose hand is that?

A That is in my hand.

Q Can you fix the date of that writing?

A The same answer as the preceding question -- page.

Q 433, is that in your hand or somebody else's?

A That is entirely in my hand, and I fix the same date, that is the second half of 1939 or first month or two of 1940.

Q What does Exhibit 431, I am going back, 431 relate to?

A Exhibit 431, I am visualizing the connection between

contacts and condensers, but this is all I can tell you about that exhibit.

Q To what does 432 relate?

A To the same subject.

Q Up at the top of Exhibit 432 there are some symbols?

A There are.

Q Can you interpret those symbols?

A It says the double La Placean of W equals -- he doesn't want me to say that.

Q Say it that way and we will see if it is something comprehensible to a lay person.

A It says the double --

Q You have your hands up to your mouth and the reporter can't hear you.

A The double LaPlacean of W equals KW.

Q We will have to furnish spellings of LaPlacean. What is that?

A It's a fourth order differential operator which relates to flexible plates, and you see I find a little disparity between that and the whole upper half of the page with the lower half and it looks as if it's a species of doodling, I don't mean doodling, I am thinking, and perhaps I am accomplishing something as I write that kind of stuff but I don't -- but I don't fancy that I can -- I know that the double LaPlacean of W equals KW is an equasion that relates

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to plates. You remember that I had work going on in these directions.

And W equals, you know I hate this, to testify to this, W equals U of X and Y times an explanation there probably represents a special solution of this equasion. I can't verify that instantly in my mind and I hate to testify this is true, but this relates to some formative process in which I am seeking solutions of this partial differential equasion which resides at the upper end of the page.

Q Does that thinking on your part have any relationship or did it at that time to your reference in connection with the computing machine?

A It did not. I mean not direct. Of course, indirectly there were connections but not directly.

E-7-2

Q On Exhibit 432 is the word written ab initio, if I am reading it correctly?

A Ab initio, yes.

Q Is that in your hand?

A It is.

Q Can yougive us any idea why that is written on this page?

A No. But I can tell you what it means.

Q I think we will let the judge figure that out.

A He knows that kind of thing, doesn't he?

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Q Exhibit 433, is that in your hand?

A That is entirely in my hand, sir.

Q To what does that relate?

A That relates, you see, neither -- either up there? That is logic circuits, isn't it, clearly?

Q What do you mean by that?

A Well, you know, we now say either or, but you see, this was done long before either or were ever used in connection with computing logic circuits. This is written far before that, and this represents my own efforts in the logic circuit area.

Q Approximately what date would you put for Exhibit 433?

A There is no question that this is all material from the years 1939 and 1940.

Q Look at Exhibit 434.

A Right.

Q Whose hand is that in?

A That is in my hand.

Q Now, there are some representations there in circles?

A There are.

Q What are those?

A You know, maybe, you know, I know I thought about it, and I would say that this page represents an effort to develop a diode logic on my part.

Q What is a diode?

A A diode is a vacuum tube with two elements.

Q What is the vintage or approximate date on which you put down 434?

A 1939 or early 1940.

Q With respect to the zero's and one's that appear on Exhibit 434, to what do they relate?

A They relate to the digits of a base two number system.

Q Turning to Exhibit 435, in whose hand is that?

A That is in my hand.

Q To what does that purport to refer us?

A You see, you know this gives me some strange feeling also because I see there an effort to concatinate vacuum tubes in a way that it's much easier with transistors, concatinate, that is, put them in series, another effort at logic circuits.

I am looking for easier ways of putting together logic circuits at this stage.

Q Can you fix the approximate date of Exhibit 435?

A 1939 or early 1940.

Q Referring now to Exhibit 436, and just for physical reference purposes, is thatall in your hand?

A The main drawing is in my hand.

Q Is there some red marking on Exhibit 436?

A Yes, sir. And that is also in my hand.

Q To what does Exhibit 436 relate?

A Well, the red markings refer to certain functional, functionale, and there is a difference in those two words, functionale processes which are related to the work of Gross and his predecessors. The drawing which resides on that page I have less hints, it is elements of the logic circuit, however, You see 120 across there represents our conventional 120 volts for the plates of these tubes which were used in those days.

Q Just for convenience in reference, Dr. Atanasoff, does it appear that the number 436 in effect is upside down on the page the way one would ordinarily read it?

A Yes, it does. It is clear that that is true.

Q Then can you determine from inspecting the document in front of you whether the red was written on top of the pencil drawing or the pencil drawing written on top of the red?

A I would prefer a magnifying glass or a microscopic examination to determine that. I cannot be sure with my eye.

Q In any event, is it clear that one is over the other?

A I believe that the pencil is over the red, but I am just not 100 percent sure.

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Q What kind of vacuum tubes are reflected by Exhibit 438?

A As far as --

Q Excuse me, Exhibit 436?

A Sometimes a person is careless about that, but as far as I can determine these are triodes.

Q Will you look at Exhibit 437?

A I am.

Q Whose authorship is that?

A That is my authorship.

Q Can you tell us what that refers to?

A That refers to elements of circuit logic.

Q Employing what kind of devices?

A Triodes, as far as it is clear, and an effort -- it mentions diodes there and triodes in the writing thereon, and it is evidently an effort to combine diode and triode logic.

Q Can you fix the approximate date of this document?

A I would fix the approximate date as during 1939 or early 1940.

Q Does this represent and reflect some recordation of what you were thinking about at that time or what?

A It certainly does. Yes, it does. It represents exactly that, my efforts, and I have memory of those efforts.

Q Dr. Atanasoff, in connection with your preparation to

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testify here, have you participated in the preparation of some drawings, and I used the word drawings in a loose sense?

A I did.

Q And specifically have you participated in efforts to prepare drawings which would exhibit visually the appearance of the so-called prototype?

A I have.

Q I have had marked as Atanasoff Deposition Exhibit T, a drawing which I have asked Mr. Allegretti to put on the board up here so that we all can see it.

MR. DODDS: Excuse me. Would you leave that, I want to refer to it later.

MR. ALLEGRETTI: I would like to put it on the floor so it doesn't obscure the appearance of the chart.

MR. DODDS: That's all right.

BY MR. HALLADAY:

Q I have put Atanasoff Deposition Exhibit T, with the kind assistance of Mr. Allegretti, on the board so that we can all see it, and I assume, Dr. Atanasoff, that this drawing was not physically done by you?

A It was not physically done by me. No.

Q Have you, however, been over it and checked it out, had corrections, alterations, changes and other things done to it so as to reflect your best memory of what such a drawing

would have looked like as you made one of this sort when you had completed your prototype by December 15, 1939?

MR. DODDS: Object to the question as leading.

THE WITNESS: I can state in my own words that -- what happened in the construction of this drawing. I made certain sketches, and these sketches were incorporated by a draftsman into a machine and then later I worked over it and I found errors and those errors have been successfully corrected on three occasions, at least, so that now this machine represents my memory of the general appearance and the effective inter-relation of the parts of the machine as it was in late 1939.

Q Now, I think that in giving the answer which you did, you had one verbal inadvertence. Will you state for the record again, please, the process by which this drawing that has now been marked Exhibit T was prepared?

A I first made some pencil sketches illustrating my memory. These were taken by the drawing -- by the draftsman, a patent draftsman and he prepared the original of this drawing. Subsequently I have examined it on a number of occasions and on at least three occasions corrections have been made at my suggestion as to parts which were incorrect and so that now I have, in my last examination, I found nothing wrong with this drawing as compared with my memory

of the structure as of that date, as of the date late 1939.

Q And for the purposes of the record, Dr. Atanasoff, can you give us a verbal description of an interpretation of what we see when we look at this drawing, Exhibit T? First let me ask you this question. Are the labels on Exhibit T with the arrows connected to the labels, to your recollection, accurate?

A They are accurate.

Q And can you by reference to this exhibit T take your mind back to late 1939, describe the physical appearance of the prototype and tell the Court how the prototype operated?

A I can.

Q Will you do so, please?

A May I use a pointer, if I also read the label in each case?

Q If that would be helpful to you it would be quite all right, and there is a pointer on the board in front of you.

A We have before us --

Q Now you are turning away from the reporter so please keep your voice up.

A We have before us first a circle of bakelite. On it are mounted condensers. The condensers, there are two

rings of condensers as are indicated there, one ring on the near side and one ring on the far side. This was just for economy of structure. The ring on this side and the ring on the other side were related as the cylinders in the large machine called KA is related to the cylinder called CA.

KL=32
8/1/1/32
WS

One finds the slow shaft in this position, horizontal position, the slow shaft is the horizontal shaft on which the circle of bakelite is mounted. The slow shaft is geared to the fast shaft with a worm and wheel. In the rear, the fast shaft marked there occupies this position. On the fast shaft are two devices, the commentator which is used for boost purposes and the commentator which is used for carry-over.

Q I observe, Dr. Atanasoff, on Exhibit T the term condenser and also the term capacitor. Do you see, for example, carry-over capacitor to which I am pointing?

A I do, yes.

Q And up above, condensers?

A Yes, sir.

Q What if any relationship is there between those two terms as shown on Exhibit T?

A These terms are employed synonymously. They are each so common that it is very easy by inadvertence even when great determination is used to avoid each of them entering a form, any form of discourse. Now, you see the fast shaft has on it a pulley and the pulley is driven by a motor which is probably a washing machine motor. It was a core horsepower non-synchronous motor, just an ordinary induction motor, probably split phase in character.

Now, we see, to summarize additional

8/1/2/33

apparatus, a small metal box here on which are two vacuum tubes.

Q The small metal box to which you are pointing being labeled on the drawing what?

A It's labeled metal regenerating circuit -- memory regenerating circuit. These three -- this box was -- this circuit, this portion of the circuit here was used to regenerate the portion of the memory which was associated with the condensers. Well, let us say -- It doesn't make any difference -- let us say on the near side of the shaft. We have gotten things hidden there so you can't tell which is which. On the other hand, there is another box which is called 8-tube add-subtract mechanism, and you will remember the 8-tube circuit previously demonstrated in -- the reference I cannot give you, but previously shown here. This circuit employs triodes and these are double triodes, the ones with the grid caps there.

Q The objects to which you are now pointing, five dual triodes --

A They are dual triodes of the variety 6F8G in this circuit.

Q Dr. Atanasoff, the object to which I am attempting to point now with the light pointer on the 8-Tube add-subtract mechanism box, is that what you have elsewhere called an

8/1/3/34

envelope or envelope?

A Yes.

Q All right. I am sorry to interrupt you like this.

A Sure.

Q But in an effort to keep this record --

A Sure, you have to keep it straight.

Q I hope clear. Continue with your description, please.

A Well, there are, you see inside one, two, three, four, five double triodes, dual triodes is another name for it, and then you see three tubes without the grid caps and these are pentodes, and we have had the designation of those pentodes before us. I know -- I remember these are 6F8G's and I will verify that sometime. This is also a pentode here in that other circuit.

Q In the memory regenerating circuit?

A There is also one pentode in the memory regenerating circuit.

Let me do this right. Over here to the right marked power supply is another box with electronic circuits in it and this device, probably that is a double diode for rectification purposes, this is probably a 180 type tube, 180 because those were, I believe, current in that day. This unit supplies through the leads which are demonstrated here

8/1/4/35

into the rest of the apparatus, the voltages for operating the rest of the circuit. It supplies filament voltage for these other electronic chassis and plate voltages for the other electronic chassis, and in these circuits we have always employed to a positive and negative voltage. These positive and negative voltages being approximately equal for the purposes of the way that the logic circuits co-act.

Now, on this power supply chassis there is also an on and off switch, and at the other end a wire connected to a plug which is used to drive power from a common AC main. And attached to the motor there is also a plug so you can operate the motor without operating the rest of the apparatus, or the reverse.

Now, we find below here some things called clearing switches -- correction, omit -- I will explain something else first because it will be easier.

You notice that the condensers are connected, they are connected at the outer ends to buttons, and these buttons, as a matter of fact, we know today are nothing but contact points for switches of the day which can be procured very easily. They are supplied with the contact at this end, turned, and a little stem that goes through and is attached to the bakelite by a nut at the other end.

Now, there are contacts on the other side, but one only sees the nut end of that other contact on

8/1/5/36

the opposite side. The two sets of condensers are offset by half the spacing of each so that they all go on the board. They all do not -- they do not connect electrically.

All right. You will notice that the condensers are connected to a contact point at that terminal and connected to a common slip ring at the inner terminal. It doesn't seem to have a designation. Yes, it does, it does say slip ring and brush. This is a slip ring right there and the brush bears thereon and comes off like this. This occurs not only on the near side of the disc but on the far side of the disc, exactly a similar structure.

W-8-2

Now, you notice the lead leading from the brush bearing on the slip ring down through here and going through a clearing switch to a terminal to the brush bearing upon the boost commentator on the fast shaft. Now, that means -- that is an important logical part of the way this machine works. When signals are being read back into the condensers, the condensers are always boosted in voltage. This is so when they are unboosted and the external ends are being read into the logic circuits or into the memory regenerating circuit, as the case may be, that these voltages will turn out to be positive and negative. You know vacuum tubes don't put out positive and negative voltages, they put out voltages which vary, but they are always positive voltages above the ground to avoid, to bring these voltages down to the level of the input requirements of the vacuum tubes employed in the memory regenerating circuit, and in the logic circuit inputs we boosted them durimg the time these voltages are read back into the condensers and then drop them to zero, drop the slip ring, that slip ring, by means of this device, the device being the boost commentator will be dropped to zero point.

Now, to wipe out the signals on the condensers, it is only necessary to not boost during a revolution, and a little consideration will show that this

will result in all of the signals being cleared from this ring of condensers if one of those buttons is pushed.

I am looking now at the clearing switch, at the item called clearing switch, which has a ground attached to it, but all we do is ground this lead per revolution, and then the near side, condensers on the near side will vanish, the charges on the condenser on the near side will vanish or they will pass into that state which corresponds to zero, and when you push the other button, the condensers, the chargers on the condensers on the far side of the disc will vanish or pass, more precisely, pass into that state which corresponds to the signal zero. The signal zero means the signal zero in the base two number system.

We have a coding that I might mention for the sake of clarity. The voltage minus five, any voltage between minus five and minus 100 or on up will be called a one, according to this coding system, and any voltage of zero or plus will be called a zero according to this coding system. This is a coding system used both in the prototype and in the main machine.

Now, if one wishes to add two numbers -- I might say this, in this machine numbers were placed on these condenser circles by the simple expedience of stopping the machine and taking in your hand a lead which is connected to a

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battery of the proper -- as a matter of fact, if these had been previously cleared, the voltages will correspond to zero, so it's only necessary to put the one's on the ring of condensers, and you will find us doing this all the time and it looks like a common earthy method of doing this, of accomplishing this purpose.

What we do, if we want a one there, we just have a lead with a negative voltage and we just reach up and touch that point, and if you want to put in three one's in succession, touch that one, touch that one, touch that one or any other combination you wish. You have plenty of time to do it because the time of charge of these condensers, we got real good condensers, as good as we could get in that day, we can get much better ones today, and you can put any number you want to all the way around. And then you start the machine, and you can see -- we had a method of verification that the number on there is correct. Now, likewise, you could put any number you wished upon there, any base two number that you wished upon the rear of this condenser circle. Then, when you -- if you wished to add these two numbers, why, you proceed as follows. You have the numbers rotating, being maintained by the memory regenerating circle, as far as the near ring of condensers go, and a simple consideration will show that the logic circuits are also regenerating the condensers on the far side of the

4

circle.

And then we push a switch here. We push upon that member, the one-cycle switch. We push upon the one-cycle switch right at that point, and this is exactly the way it was made in that prototype. You are pushing, and you notice it can't go forward because of this circle on the slow rotating shaft. And then the notch comes up and it slips in. Then you take your hand away and it's locked in there, and it goes through a cycle, and when it has finished the cycle it snaps back out, and in this way by a very simple mechanical device, we get a one-cycle operation. Doing it differently, of course -- in the later machine we did it differently, but in this machine we get in this way a one-cycle of operation.

During that cycle, the following series of events will be occurring. The charges on the near side, this will be maintained by the memory regenerating circuit, but also, the signals hereon, as a result of agency of this switch, will be being presented to one of the terminals of the logic circuit. Also being presented to one of the terminals of the logic circuit will be the signals from the back, from the condensers on the back of this device. Also being presented to this box --

XL=37
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IS

Q This box --

A This box being the logic -- the box representing the logic circuit or the add-subtract mechanism -- which is it called -- add-subtract mechanism. All right. Three signals are coming into this box, the signal from the near group of condensers called KA, the signal from the far group of condensers called CA and the signals being carried from the previous step in the operation by the carry-over capacity and the carry-over commentator. This box does in successive the operation involved in each of these steps and it replaces the signal in CA by the signal which corresponds to the sum, if an addition is being performed. The logic circuits will be demonstrated to perform either alternately sums or differences and we have seen some evidence of that in testimony that has already been presented.

Q In December of 1939 when the prototype was in its then condition, you have earlier said you had performed some tests on it. Will you describe those tests?

A I will attempt to describe the tests on the prototype and the associated apparatus logically so that there is a group of tests here depicted. Is that satisfactory?

Q Quite, all right with me, Doctor.

A Now, you see we had this box called -- we had a number of tests that we did to demonstrate the operations of the machine and the satisfactory condition of the components

8/3/2/38

thereof, and I will enumerate these tests. We had a test, a kind of a test to show that as a matter of fact, this memory regenerating circuit was regenerating the memory of the near circle of condensers.

Let's list these tests. One test, the method of doing this fairly obvious. You put any signal you desired on the near ring of condensers. You used an oscilloscope to read the signals thereon, and you noted as the machine was operated where the signal changed with time, and if the signal persisted, if you put it on a certain way and it remained in that way as time passed, you knew the memory regenerating circuit was in operation. Two, the first tests on the add-subtract mechanism were not done in connection with this machine but in connection with separate circuits. There were external circuits provided called a test set, which is not here drawn. The purpose of this test set is to apply signals to the add-subtract mechanism like the signals applied from the condensers and from the carrying mechanism and verify if the two outputs of the logic circuits were correct. Two outputs? Why, of course there were two outputs, because one of those outputs that the add-subtract mechanism went in to replace the charge previously upon the condenser circle in the far end of the disc, and the other one went past, back up here into the carry-over capacitor to replace the carry-over capacitor if a carry-over was required into the next place.

8/3/3/39

Those were the two outputs.

So we have the second group of tests in which we placed the add-subtract mechanism in a test rack, supplied to it voltages corresponding to the code for numbers which I have at this time described, and observed whether the outputs of that box were proper.

Now, we had to be sure that they were proper, not only under exact conditions because this isn't appropo to practical operating conditions. We had to make sure that this device would operate satisfactorily throughout the range of operating voltages and normal to the circuits being employed.

On this set we didn't have one bit of voltage regulation and I remember no difficulty with the operation of the set except those usually attendant to getting the darn thing.

Q When you say this set, you are talking about --

A The whole thing, if you wish, or more precisely, with the add-subtract mechanism, which I was emphasizing at that point.

Q Again, just the term this set, meant what?

A That is no good. It means this entire device, the prototype on the one hand, and it more specifically means the add-subtract mechanism, the add-subtract mechanism resting in a test set.

8/3/4/40

Then the next step would be actual computations with the device, in which arbitrary numbers were placed on the near set of condensers and the far set of condensers. The one cycle switch was operated. You will notice there is a control here on the add-subtract mechanism which says add and subtract. If that control is toward the top this add-subtract mechanism will add, and if it's towards the bottom, it would subtract, and we, of course, tested that in both positions. Arbitrary numbers were placed upon the two circles of condensers.

8-9-1

The one-cycle switch was depressed and, of course, the signal on the near set of condensers being like the signal on the keyboard of any computing machine would remain unchanged, but we would verify whether the signal on the far set of condensers, ones on the opposite side to us as observers then became charged in the way which depicted a number which correponded to the logical and mathematical sum of the two numbers which were on the circles to begin with. Equally the tests were made for subtraction.

Q By what method did you verify that subtraction or addition had been accomplished?

A Well, the only method we had at this time for reading numbers out of the ring of condensers was by a cathode-ray oscilloscope. Was this the general line of thought?

Q I don't have a general line of thought, Doctor. I am asking you to tell us what happened?

A Well, I wonder if I properly understood your question? But I will go on this tack. I suppose this must be what you meant. I understand the logical difficulties of a deposition and the law slightly. I will proceed.

Q You had used the term that you had a method to verify.

A Thank you.

Q I am asking for a verbal description of that verification method?

A That confirms my suspicions. Now, even oscilloscopes were short in those days, and we had an oscilloscope in which the plates were brought outside and it was operated in connection with the tests on this and succeeding machine in the following way. A voltage was supplied, and this voltage, linked through a high resistor charging the plates of the condenser, charging the horizontal plates of the cathode-ray oscilloscope causing the point to move in towards the right. I could employ, I mean a blackboard, if it were possible.

Q Let's try it just verbally, please.

A All right.

Q I know it makes it more difficult for you but let's try it that way.

A It's easy enough for me but I only have concern for the listener. You see there was a source of voltage of such polarity available and this source of voltage, to this source of voltage, to one side of this source of voltage was attached a higher resistor, and to the other, to the other side was attached nothing except that it was attached to one plate of the condenser, and the other terminal of the resistor was attached to the other plate of the condenser and slowly charge would leak on to the plates of the cathode-ray

oscilloscope and to the condenser connected across them so that the point would slowly move to the right. There was affixed to the slow shaft a little contact, I remember it was a set screw and opposite the set screw was a brush and these two connections are not shown in the diagram here. When the slow shaft came to a certain portion of the circle, the set screw contacted the little spring and the spring discharged the condenser across the plates of the oscilloscope causing the oscilloscope spot to move to the left again to the zero position. The net result was as follows: If you had no vertical charges being applied to the oscilloscope, if you had no vertical, no charges being applied to the vertical plates of the oscilloscope, the spot of the oscilloscope would move slowly to the right during the active portion of the cycle of the machine and would return to zero during the inactive portion of the machine during, that is, during, while there were no condensers contacting the brushes of the machine. That was the inactive portion of the cycle. So far for the horizontal plates.

This represents what would be called today a method of syncing the oscilloscope into the apparatus, but the sync which was originally on this oscilloscope was unsatisfactory for the purpose so we built this external syncing circuit of very simple character which was used in testing this prototype and the main machine.

Q What is the word syncing short for?

A Synchronizing. It's short for synchronizing.

Q Continue, please.

A Now, as far as vertical motions of the oscilloscope go, we could take voltages from a point inside of the memory generating circuit or from a point inside of the logic circuit and these voltages could be used directly or through amplification, and we did both, mostly directly, to move the spot up and down. The net result of all of this is that when the oscilloscope was connected to the machine in the ways which have been described, there appeared on the screen of the oscilloscope a jagged line, and from the shape of this line, one could determine what base two number was on either the near set of condensers of the vertical plates were connected to the memory regenerating circuit, or the far set of condensers if the vertical plates of the oscilloscope were connected to some point, and I could describe that point with diagrams but I can't describe it very well without diagrams, to the add-subtract mechanism. This is a method of verifying numbers upon this oscilloscope, a very homely method, and one that has no significance here particularly. It would be instantly recognized by persons skilled in the electronic art as a valid method for understanding this awkward- this device. It was an awkward method, but it was the only method we had until the completion of our data-in, data-out

apparatus.

Q After that time, Dr. Atanasoff, did you continue to have the prototype on hand for any period of time?

A The prototype actually existed in the laboratory from its date of completion which was, I don't know when, November or December of 1939, late in the year 1939. Now, you remember Clifford Berry didn't go to work on this prototype until September of 1939, and this prototype was working satisfactorily in the laboratory by the end of the year and from that point onward into the next year the prototype was in existence; however, after two or three months of 1940 had passed, we had managed to get the main machine, the one whose pictures you have seen, into existence, and so it could be used for the demonstration. At that time the prototype was destroyed.

Q Now, referring to Atanasoff Deposition Exhibit U which I have had Mr. Allegretti put on the board before us, is that merely an enlarged portion of Exhibit T to show further detail?

A It is. I never saw it before, but it certainly is. Yes.

Q All right. After the prototype had been completed, will you describe for us the work that went forward in connection with the main machine?

A Well, during the late months of 1939 and the early

months of 1940, design work was going on on the main machine, the various appurtenances thereof were being conceived, sketched, organized, interrelated and in general those steps were taken which were necessary for selecting the structure of the main machine and for carrying forth the construction of that main machine. This doesn't coincide too exactly to the method, to the present methods of invention, if you allow me to use that term provisionally, conception, design and so forth, because the whole work was being rapidly pressed and phases overlapped. They were not, all the phases, for instance, of the prototype were not the only activities taking place at one time, but the prototype, the prototype, at the same time a great deal of time was spent working on elements of design of the main machine.

Q Will you turn to Exhibit F-1-D, please?

A I have F-1-D.

Q Photograph No. 1402?

A I have 1402.

MR. HALLADAY: We have a problem of assembling some papers here to get them in order to correspond to the order of the questions I have in mind. Would it be all right with you if we quit now and come back 15 minutes early?

THE WITNESS: Fine.

MR. HALLADAY: Can we come back at

a quarter of 2:00 in place of 2:00, is that agreeable?

MR. DODDS: Agreeable.

(Whereupon a recess was taken until 1:45 o'clock P.M., November 15, 1968.)

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EA - KL

November 15, 1968
2:00 o'clock p.m.

Whereupon,

JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

MR. HALLADAY: May it be understood that we will recess today and, incidentally, in order to permit Dr. Atanasoff to catch a plane, we would like to quit at 4:30.

MR. DODDS: All right.

MR. HALLADAY: Unless there is a logical stopping point prior to that time, and I will try to keep track of the time and not make you run too hard.

THE WITNESS: Four o'clock, Henry. I tell you I will be running hard if I make it by 4:00 o'clock. Will you have Mr. Halvorson available to help me do various errands?

MR. HALLADAY: I will. Then we will reconvene at 10:00 o'clock a.m. on Tuesday, December 3, 1968 in these same quarters. I hope it will be this identical room, and I will do everything I can to make it available. Otherwise if there is some change I will

12/2/42

let everybody know, and we will then run through Friday, December 6, and if it appears that the deposition can be completed in its entirety by working on Saturday the 7th, this is agreeable. Otherwise we will at that time consider a date for completion, and I am suggesting we tentatively reserve for that purpose reconvening again on Wednesday the 11th. However, I am asking that this be reserved to block out any other intervening interference with the assumption that if we don't conclude on the 6th or 7th we will make every effort to do so on the 11th, 12th or 13th, and at that point we can consider more definitively how much, if any more time may be required.

MR. DODDS: I assume that the Bell Telephone Laboratories depositions which were originally scheduled for the 18th are put over?

MR. HALLADAY: We will have to be working around that and will be in further touch with you.

Also, to clarify the state of the record, I believe I now can say, Mr. Dodds, and I wish you and your associates would check to be sure, we have now given you an additional set of Atanasoff Deposition Exhibit H-1 including documents numbered 1,000 through 1224 which so far as I presently am informed is complete.

MR. SHIMER: Well, we have them but I

9/2/3/43

haven't checked the numbering of it.

MR. HALLADAY: I understand. My purpose is to say as far as we are concerned we have delivered to you an additional set and I believe these are more legible than the earlier set, and in any event, I am reasonably certain that portions which had been clipped off of the earlier set are contained on this one.

We also have delivered Atanasoff Deposition Exhibit C-1, including documents 0168 through 0196 which we believe now to be complete. We have also furnished you Dr. Atanasoff Deposition Exhibit B-1, document 012, and from Atanasoff Deposition Exhibit I, document number 01544 through 01551 inclusive, so that either with the first or second sets or by combination thereof we have done what we believe was suitable to give you copies of everything to which reference has been made in the course of the deposition.

MR. DODDS: I would like also to say that I assume that we will receive copies, reproductions of these various charts to which reference is drawn or to which he has referred in time to give us time to study them before we resume.

MR. HALLADAY: We have made preparations to take Polaroid copies of them in the belief they will be sufficiently legible for you to study them, and I will

9/2/4/44

forward them as soon as I get them completed. Then if larger copies for some other purposes are wanted at a later time, arrangements can be made with respect to that. I may also take photographs of the large exhibits on a process which will permit them to be put on a slide for easier portability in which event, if I do so, I will so advise you.

MR. DORITY: May I use a phone to make a call for a change in quitting time. We have a man coming here to help us with the exhibits.

MR. HALLADAY: Would you mind using the phone next door?

MR. DORITY: All right.

W-10

BY MR. HALLADAY:

Q One point of clarification in my own understanding, Dr. Atanasoff, at a given moment when you were testifying, you made reference to the circles of condensers on the prototype as being, according to the notes I put down at that time, incomplete, and I was not clear from the context of your statement whether you meant by that that the circles were unfinished or were less than 360 degrees or what you meant. I direct your attention to Atanasoff Deposition Exhibit U which we have on the board, and can you tell us for a more perfect understanding if the circle of condensers that is reflected on that exhibit is incomplete within the meaning of the word as you employed it in saying the circles were incomplete?

A You will note that the condensers are uniformly spaced around the circumference of the desk. As a matter of fact, the condensers connect to terminals and the terminals are uniformly spaced. But this series of condensers and terminals only occupies a part of the circumference. There is an open portion which may amount to a sixth of the whole circle. It's not a critical matter, a sixth, though maybe more or less. But that gives us, that allows the machine to run continuously but gives us a vacant period during the operation of the machine when various switching operations can occur.

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Q Was that condition of being incomplete, as you have just now described it, something due to the unfinished condition of the discs or was it a deliberate proposition?

A It was a deliberate proposition because we required time to do switching.

Q You required what?

A Time to do switching.

Q By that, what do you mean?

A Well, for instance, that one cycle switch, that one cycle switch has to be closed and opened during that period. Otherwise, it might come in in the middle of a signal and you wouldn't know what you had. And you will note that there is another meaning to this vacant period, since a number -- you will notice that the large disc turns in the direction indicated with the arrow here, so it is moving downward and if this is encountering any brushes, this is the first place, this is the second place, this is the third place, and so forth, in the order of the digits of the base two number system, and this is the last place. Yes, sir, that statement is correct. The contact at the bottom and the condenser there connected to constitutes the last place of the series of the base two digits.

Q All right. Do you have your photographs in the sequence 1402 and following before you?

A I do.

Q Would you look at 1402, please?

A 1402 is before me.

Q And can you tell us approximately when that view was taken?

A Well, there is a date on the negative as to when this was taken.

Q Well, was the information from the negative reflected on the back of 1402, the enlargement?

A Yes. It says there 4-22-40.

Q Do you recall now that we went through this negative process yesterday?

A Yes. This is the same date as on the negative, I can promise that.

Q Will you look at a document that has been marked Mauchly Deposition Exhibit Z and tell me whether or not that by inspection appears to be a duplicate of 1402?

A It is the same picture.

Q Will you turn to 1403?

A They are not in order. I will have to straighten them out.

Q Do you have 1403 before you now?

A I have 1403.

Q And what is the date on which that photograph was taken?

A That photograph was taken on 4-22-40.

Q Will you look at Mauchly's Deposition Exhibit Y and tell me if that is a duplicate of 1403?

A That is a duplicate.

Q Will you now locate No. 1407, please?

A 1407.

Q What date was that taken on?

A That was taken on 8-7-40.

Q Will you look at Mauchly Deposition Exhibit AA, please, and state whether or not that is a duplicate?

A That is a duplicate.

MR. DODDS: What was that date?

THE WITNESS: The date is 8-7-40.

I imagine it is the seventh day of August, 1940.

BY MR. HALLADAY:

Q Will you now find Mauchly -- excuse me -- your No. 1408.

A I have it.

Q What date was that picture taken on?

A It says on the face of it it was taken 8-7-40.

Q Will you look at Mauchly Deposition Exhibit BB and tell me if that is a duplicate of 1408 -- excuse me, Mauchly Deposition Exhibit BB.

A This is a duplicate of my No. 1408.

Q Will you find it now 1405?

A 1405 is before me.

Q What is the date of 1405?

A 8-7-40.

Q Is that or not a duplicate of Mauchly Deposition Exhibit CC?

A It is a duplicate.

Q Will you find Atanasoff Deposition Exhibit 1406, please?

A 1406.

Q What date was that picture taken on?

A That was taken on 8-7-40.

Q Will you look at Mauchly Deposition Exhibit DD and tell me if that is a duplicate of your Exhibit 1406?

A It is a duplicate.

Q Will you please find your Exhibit No. 1413?

A 1413 is before me.

Q Excuse me. Would you turn back to 1406?

A I have 1406.

Q The same as Mauchly Deposition Exhibit DD, is that?

A It is the same as Mauchly Deposition Exhibit DD.

Q What is the date of Exhibit 1406?

A 1406 has the date 8-7-40.

Q Then do you have 1413 before you?

A 1413 is before me.

Q What is the date of that photograph?

A I do not have a date for this photograph.

Q Is it a duplicate of Mauchly Deposition Exhibit EE?

A It is a duplicate of EE.

Q Will you now locate your Deposition Exhibit 1410, please?

A 1410 is before me.

Q Do you have a date for that?

A I do not have a date for this.

Q Do you observe whether or not Mauchly Deposition FF is a duplicate of your exhibit No. 1410?

A It is a duplicate.

Q I have also in my possession here a photograph marked Mauchly Deposition Exhibit GG for which I believe there is no corresponding number in your file. Will you look at that exhibit, please?

A I am looking at it.

Q Of whom is that a photograph?

A That is a photograph of Clifford Berry.

Q What does he hold in his hands?

A He holds in his hands a chassis with terminal block, and located on there are 45 twin triodes of the type 6C8G with grid caps. This circuit is used for regenerating the bank of condensers called KA.

Q Do you recall whether or not that photograph, Mauchly Deposition Exhibit GG, is the same or different than a photograph of Clifford Berry that appeared in the Morning Tribune on or about January 15, 1941?

A It is the same picture.

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11/1/1/45

Q Will you find Atanasoff Deposition Exhibit No. 1417, please?

A I have before me 1417.

Q Can you fix the date of that photograph?

A I cannot exactly.

Q Can you fix it approximately?

A This came from Mr. Clifford Berry's thesis and Mr. Berry's thesis was finished in the middle of 1941. That means at the end of the first summer session and second summer session, so the date of this photograph is early in the summer of 1941.

Q And is your Exhibit 1417 the same as or different than Mauchly Deposition Exhibit HH?

A It is the same as Mauchly Deposition Exhibit 8H.

Q HH?

A HH.

Q Will you please find Atanasoff Deposition Exhibit No. 1418?

A I have before me Atanasoff Exhibit 1418.

Q Can you identify the date or approximate date of that photograph?

A Well, that would be early in the summer of 1941.

Q By what method do you arrive at that?

A I am using this because this was included in Clifford Berry's thesis, and his thesis terminated, oh, in

11/1/2/46

July or something of the kind. So it is necessary that this object be prepared for publication and it would be, oh, certainly we have a date for the date filed of, and I am sorry I don't have the exact date filed in my mind, I just don't have it in my mind. Somewheres I have it in my records the exact date which Clifford Berry's thesis was filed with the library.

Q That can be established by other methods.

A Yes. You can be sure this occurred, this photograph was taken at least two weeks prior to that date.

Q And is your Exhibit numbered 1418 the same as or different than Mauchly Deposition Exhibit II?

A It is the same.

Q Will you find Atanasoff Deposition Exhibit 1416, please?

A I have in my hand.

Q Can you fix the date as of that photograph?

A This photograph is also from Clifford Berry's thesis, same explanation as before.

Q Is it the same or different than Mauchly Deposition Exhibit JJ?

A It is exactly the same as Mauchly Deposition JJ.

Q Do you have before you No. 1409?

A I have before me 1409.

Q Can you fix the date of that photograph?

11/1/3/47

A I cannot fix the date of this photograph.

Q Can you identify its source?

A Its source is from the private files of Clifford Berry.

Q Would you look at Mauchly Deposition Exhibit KK and state whether or not that is a duplicate of your Exhibit 1409?

A It is a duplicate.

Q Have you 1414, the photograph before you?

A 1414 I have.

Q Can you fix the date of that photograph?

A Again I do not have a direct fix on the date of this photograph.

Q Do you have a reference to its source that could lead to fixing the date?

A It was obtained from a picture found in a photographic album by Clifford Berry.

Q Found there by whom?

A By me.

Q Is Exhibit 1414 a duplicate of Mauchly Deposition Exhibit LL?

A It is a duplicate.

Q Will you find Exhibit 1415, please?

A 1415. I have 1415.

Q Can you identify the date of that photograph?

11/1/4/48

A I do not know the exact date of this photograph.

Q What is the source of the enlargement that you have before you No. 1415?

A It came from the original photograph -- it came -- it is a reproduction of a print supplied by Mr. Norman Fulmer of General Electric.

Q Who is the person who appears in the Exhibit 1414?

A Mr. Clifford Berry is standing there.

Q Is your Exhibit 1415 a duplicate of Mauchly Deposition Exhibit MM?

A No -- well, it is substantially the same photograph. I believe that -- let me see. I must have something that is closer than that. I have it somewheres. It is the same picture, from the same instantaneous exposure, but the source is different. I am afraid that we don't have that exactly, that one here.

Q With reference to the appearance of the objects in the photograph Mauchly Deposition Exhibit MM, and in your deposition Exhibit 1415, is there a difference in the quality of the two reproduced reproductions?

A Yes, there is.

Q Which one is clearer to the eye?

A The one that is called Mauchly Deposition Exhibit MM.

Q Otherwise are the objects that are reflected in the photograph in each of the two photographs apparently identical

11/1/5/49

on inspection?

A They are. May I make a further explanation of this?

Q You may.

A You remember I told you that there was two sources of that exact photograph and the second one I got the original -- I borrowed the original print which Norman Fulmer had taken to this time, hired a high-grade photographer, and he did his best to reproduce it as well as possible, and I think this has resulted in additional clarity of one print over the other.

Q All right. Will you locate your Exhibit 1412?

A 1412 is before me.

Q Can you fix the approximate date of that photograph?

A I have no firm date for that photograph.

Q Do you have any point of reference for dating it?

A Well, we can, by the state of completion one can make an estimate that it is along into the beginning of 1942.

Q And is Mauchly Deposition Exhibit NN a duplicate of your Exhibit 1412?

A It is.

Q Would you find your Exhibit 1419, please?

A 1419.

Q Can you fix the date of that photograph?

A I can. The date of this photograph is 18 May, 1942.

Q And from what source do you obtain that date ?

11/ 1/6/50

A From my original records transferred to me by the photographers who took the picture.

Q And will you look at Mauchly Deposition Exhibit 00 and see if that's a duplicate of your Exhibit 1419?

A It is a duplicate.

Q Have you got 1411 there?

A Here is 1411.

Q Will you refer to the photograph marked Atanasoff Deposition Exhibit 1411, Dr. Atanasoff. Do you have it before you?

A I do.

Q And can you fix the date or approximate date of that photograph?

A I have no firm date, firm estimate of the date of that photograph.

Q Do you recall the source of the photograph?

A The photograph came from, again, it's from Clifford Berry's files, private files of Clifford Berry out in Altadena, California.

Q Who is the person in the picture?

A The person in the picture is Clifford Berry. I can give you an approximate date, estimated date for that photograph.

Q Will you do so?

A The estimated date of that photograph is

11/1/7/51

September of 1941.

Q Now, we have also in the course of another deposition had identified as Mauchly, referred to as Mauchly Deposition Exhibit X, which I think is not duplicated by anything in your personal file?

A I have a copy.

Q Would you look at that?

A It's extraneous.

Q What's that a picture of?

A That's a picture of the physics department. It overlooks the window of my office in the physics department as of those years.

Q What years?

A I don't know. Maybe even these years, but it looks too grown up for those years. I guess it is of late years, probably.

Q All right. You don't know the source of Mauchly Deposition Exhibit X?

A I do not know the source of that. I think it was taken recently.

MR. DODDS: Excuse me. 1411 did not correspond to a Mauchly Deposition exhibit I gather?

MR. HALLADAY: No.

THE WITNESS: Not exactly.

MR. HALLADAY: We didn't have that one with us at the time we were with Dr. Mauchly.

E-11-2

Q Dr. Atanasoff, did you put your photographic exhibits back in the numerical order or did you keep them separated in the order which I had been attempting to identify them?

A They are back in numerical order. I am sorry.

Q Well, therefore, I am going to place before you Mauchly Deposition Exhibits in the order that they were marked. Now, this is going to get too confused. Would you mind taking the photographs you had before you out and sorting them into this order, please: 1402,

A 1402. You want that at the top or the bottom?

Q I want it at the top as you look at it so start on the bottom.

A 1402.

Q 1403?

A 1403.

Q 1407?

A 1407.

Q 1408?

A 1408.

Q 1405?

A 1405.

Q 1406?

A 1406.

Q 1413?

A 1413.

Q 1410?

A 1410.

Q 1417?

A 1417.

Q 1418?

A 1418.

Q 1416?

A 1416.

Q 1409?

A 1409.

Q 1414?

A 1414.

Q 1415?

A I believe there is a mistake. Are you sure the next one is 1416?

Q 1415.

A 15?

Q 1415?

A I have it.

Q 1412?

A Right.

Q 1419?

A Right. Shall I hand them to you?

Q I will work with the duplicates if you will keep

them in this same order and it probably would help us at some point if we had the numbers on the front, but I don't want to interfere with yours.

MR. HALLADAY: May it be agreed on that the duplicates for the Court we can have the court reporter state numbers on the face of these photographs so they are easier to tell?

MR. DODDS: Okay.

BY MR. HALLADAY:

Q You have identified 1402, 1403, 1404 -- excuse me, -- 1402, 1403, 1407, 1408 --

A Right.

Q 1405?

A Right. The vacuum tube one is next.

Q And 1406?

A 1406.

Q As antedating the middle of August, 1940? I have used the term middle of August to get us a date later than 8-7-40, purely for reference. Is that a correct statement that I have just made?

A As antedating, meaning older than?

Q Yes, sir.

A Being older than.

Q Taken prior to?

A Prior to the 15th of August?

Q Yes.

A Yes. Are you asking me what, whether they are or not or whether that is a correct statement?

Q I am asking you whether that in effect summarizes what has been said before? I haven't gone on to 1413.

A I am sorry. Yes. It seems to be true, but are they supposed to be in numerical order in any sense?

Q They should be in the following order: 1402, 1403, 1407, 1408, 1405 and 1406?

A I have them in that order.

Q All right.

A I was asking a different question. Are these supposed to be in a chronological order? I was attempting to ask that or have you decided --

Q No. All I am asking --

A Are you asking me or --

Q Whether or not they were taken prior to August 15, 1940.

A And August is the --

Q 8th month.

A -- 8th month.

Q Of the year.

A All right. There is no question about it.

Q Now, having in mind the period of time prior to mid-August, 1940 --

A Yes?

Q -- can you now say whether or not the photographs that you presently have in your hand, Exhibits 1403 -- excuse me -- 1402, 1403, 1407, 1408 and 1405 show the condition of the machine and parts thereof as they would have appeared to the eye during a period of time prior to August 15, 1940?

MR. DODDS: Objected to as leading.

THE WITNESS: They do.

BY MR. HALLADAY:

Q And within the limits of black and white two-dimensional photography, are they fair and accurate photographic representations of what they purport to portray?

A They are.

MR. DODDS: Objected to as leading.

BY MR. HALLADAY:

Q In the summer of 1940, Dr. Atanasoff, tell us whether or not you pursued any efforts to obtain funds to finance the construction of the so-called main machine?

A I was working actively on seeking funds.

Q And you have heretofore referred to Exhibit 455 which I have separated now from the folder Atanasoff DepositionExhibit F-4 in order to place it before you. During the summer of 1945, did you have one copy or more

than one copy of a manuscript prepared similar to that which is now identified as 455?

A I had two typings of this manuscript done. I don't know how many copies were prepared for typing. Perhaps we had five or perhaps we were limited to four.

Q In the summer of 1940, did you forward a copy of the manuscript that we now have identified as Exhibit 455 to anyone?

MR. DODDS: Objected to as leading.

THE WITNESS: I furnished copies of this manuscript to Irving Stewart for the Scientific Aids for Learning; to the Research Corporation in the person of Mr. Poillon for his perusal; and another copy was sent to Dr. Warren Weaver, Director of the Natural Sciences, the Rockefeller Foundation.

Q Without inspecting any copies of such documents that were received by those persons yourself, can you say whether they were exact duplicates of that one which we now have marked as Exhibit 455 or would it be necessary to see the specimen itself?

A I don't know exactly what the word "exact" means, but I can reach into this file and produce another document of the same type. These two documents placed together and this document carries the number 456 in place of 455.

Q Yes?

A Those two documents are of different typings.

Q Yes?

A And they comprise, they comprise the two typings, by accident, I suppose, I don't know. I can see they are different typings. There are slight differences, slight minute differences which can be detected and they comprise the two typings that I know, by memory, were produced of this document.

KL=52
12/1/52
WS

Q Do both exhibits 455 and 456 contain photographs which have dates on them 8-7-40?

A They have the same set of photographs within them and they have such dates as you described.

Q All right. Were any manuscripts of the character of either 455 or 456, to your knowledge, sent out that did not include the photographs with these dates on them, namely, 8/7/40, for the figures, I believe it was 8, 9, 10 and 11? Let me double check for sure.

A The answer is no.

Q To your knowledge, can you tell us whether or not duplicates of either 455 or 456 were sent to the persons whose names you have mentioned? Whether it's one or the other is what I am trying to find out, if you know.

A The answer is yes.

Q All right. Do you know which one?

A Was sent to which?

Q Yes.

A I do not.

Q Now, also in your Exhibit F-4 is a third bound volume number 457?

A Right.

Q Which appears to be some kind of a machinery reproduction of 456 or 455?

A Yes.

12/2/53

Q And I don't remember this, forgive me if it is a repeat, when was 457 machinery produced?

A I do not know.

Q Can you say approximately when?

A I can say, I can give an item or two of history of this document.

Q If that will help try to fix the vintage or lineage, I would appreciate you doing that.

A I received this copy in return for one which I gave, in return for a copy which I loaned Mr. Bradley of Chicago. I was very careless at this instant and he recited this was one of the original copies, and in this he was mistaken. I had given him -- now, I am not 100 per cent sure that I gave him an original copy, but he recited as he returned this copy to me that it was one of the original copies, and it is not, and I presume, therefore, it was made by a reproduction process by him.

Q All right.

A And I do not know what year it was made.

Q And with respect to Exhibits 455 and 456, has either of them been out of your files?

A They have at no time been out of my files.

Q Will you examine No. 1413, please, the photograph?

A I have 1413.

Q Does that photograph fairly portray the objects

12/3/54

shown thereon as they would have appeared to the eye as of the time of the photograph?

A It does.

Q And the time of the photograph, again, if you know, was what?

A I do not know the time of that photograph. I can make a statement for you.

Q Your best recollection or judgment, please.

A I must be very careful in these estimates because a person could easily get confused as these questions come without end from counsel and I suppose they will come without end from now on. I suggest that this photograph was taken about June of 1941; perhaps a month before or after that, I cannot be sure.

Q Do the succeeding photographs numbered 1410, 1417 -- you see, Dr. Atanasoff, I had assembled them in this prescribed order.

A I know they are assembled so, but they get scratched through and some pulled out and maybe they don't get back.

Q All right.

A 1410, 1417 --

Q 1418.

A 1418.

Q 1416.

12/4/55

A 1416.

Q 1409.

A 1409.

Q 1414.

A Read the next one.

Q 1415.

A All right.

Q 1412?

A All right.

Q And 1419.

A Okay, I have those in my hand.

Q Considered in that sequence, do they reflect the progress of work on the machine from time to time?

MR. DODDS: Objected to as leading.

BY MR. HALLADAY:

Q You may answer.

A I do not know.

Q Will you look at them, then, and see if you can answer the question?

A Well, the last photograph is in the right position. I don't have any doubt about that. I find myself unable to comply with counsel.

Q In other words, you cannot tell merely by an inspection of the photographs whether we have the sequencing correct?

A I could perhaps answer if you would allow me two days to think about this and to study them and to order them, then I would be able to testify and I might do some good. I have made some estimates now and I am doing my level best, but I think we had better, if counsel permits, withhold further examination in this form.

Q Without regard to the sequence, then, will you again take and have before you Exhibit 1413?

A I have it before me.

Q And the next one is 1410.

A The next one is 1410.

Q Does that fairly and accurately, subject to some deficiencies in photographic reproduction, exhibit what one would have seen with the eye on the date of the photograph?

MR. DODDS: Objected to as leading.

THE WITNESS: It does.

BY MR. HALLADAY:

Q What about No. 1417?

MR. DODDS: Objected to as leading.

THE WITNESS: It does.

BY MR. HALLADAY:

Q 1418?

MR. DODDS: Same objection.

THE WITNESS: It does.

12/6/57

BY MR. HALLADAY:

Q 1416?

MR. DODDS: Same objection.

THE WITNESS: It does.

BY MR. HALLADAY:

Q 1409?

MR. DODDS: Same objection.

THE WITNESS: It does.

BY MR. HALLADAY:

Q 1414?

MR. DODDS: Same objection.

THE WITNESS: It does.

BY MR. HALLADAY:

Q 1415?

MR. DODDS: Same objection.

THE WITNESS: It does.

BY MR. HALLADAY:

Q 1412?

MR. DODDS: Same objection.

THE WITNESS: It does.

BY MR. HALLADAY:

Q And 1419?

MR. DODDS: Same objection.

THE WITNESS: It does.

12/7/58

MR. DODDS: Again, counsel for defendants serve notice that if the deposition is offered in evidence, motion will be brought to strike from the deposition answers to leading questions.

THE WITNESS: I move you, sir, that a tea break be held.

MR. HALLADAY: That is agreeable with me.

(Recess taken.

E-13

BY MR. HALLADAY:

Q Dr. Atanasoff, did you have any --

A Thank you, sir.

Q -- role in the writing of Mr. Berry's thesis that was filed some time in the summer of 1941?

A I did.

Q Will you describe what that was?

A Well, I don't know how acquainted counsel is with thesis writing process in American universities, but usually the major professor has something to do with the thesis. In the first place, the conception of the method of recording which is depicted there was mine, the original conception of that was mine. Now, Clifford Berry was left on his own in presenting the material, and of course you know that a master's thesis are not,a great exhibit of originality is not required in a master's thesis. So Mr. Clifford Berry wrote a good thesis, and he did as much work as could be expected for a master's degree, but it certainly meant that I had a hand in writing the thesis.

Q What was the subject of the thesis?

A The subject of the thesis, I do not know the title, I do not remember the title, but the subject of the thesis was a method of recording data.

Q And will you look at Exhibit 1417, please?

A 1417. I have it before me.

Q I believe you have heretofore indicated that the source of that was Mr. Berry's thesis?

A Yes.

Q Now, what relationship does it, do the objects that are shown on Exhibit 1417 have to the subject of Mr. Berry's thesis?

A Well, of course, this is a data reading and recording apparatus which was used in the computing machine. By the time Mr. Berry wrote his thesis, we had designed and constructed this, these devices, and they were related to the recording of the data.

Q Can you describe that more fully, please?

A You mean the process of recording data?

Q The objects shown in the photograph 1417, the reading and recording of data and the subject matter of Mr. Berry's thesis?

A I presume what you want me to do is to outline the concept of the data recording which we used here and how it's related to Mr. Berry's thesis and how it's related to the machine. Does this comprise the area to which you are desirous of hearing about?

Q It may be so understood.

A Fine. Now, the concept which I had was the following: That we would use a sheet of dielectric, that the Dielectric would be punctured by electric spark at the

points where it was desired to record data or more precisely where it was desired to record a one. This would make the record. This spark source was reliable and the voltages were high enough to puncture the dielectric in question, so a record was constructed. Then the record would be read back in the following way:

As the record passed between contact points, there would be a voltage applied to the contact points which tested the dielectric at that point for a punching. If a punching is found it meant there was a one on the record. If a punching was not found it means that there would be no, no one, and no one means a zero in the base two number system.

Now, you know, we would test the efficacy of this recording process by the following method: We would measure the voltage which was necessary to punch the dielectric originally and the voltage which was necessary to read back the signals when it had previously been punched. We would take the ratio between those two voltages, and we wanted to secure that this ratio be as high as possible; that is, we were trying to select a material and a method and a shape of electrode, and what-not, so that the ratio of these two voltages would be as high as possible.

Now, we had no trouble getting

ratios of three. Of course, the material must have great uniformity because if the uniformity of the material varies more than the ratio we have in question, you are in trouble because you will be detecting signals where there are none or be failing to punch where you desire to punch. We found material -- we found material -- in the end, we found material which worked well but we never had this material under completely adequate quality control.

Now, let's talk about -- that is an outline of the method of recording base two numbers and punching them. In conception it is a very fine method because there is no question about having any rapidity of punching that you desire and any rapidity of reading that you desire, and you know this method of recording base two numbers is very efficacious and will be used, it just simply means either a punch or no punch that exactly corresponds, that alternative exactly corresponds to the zero and one of the base two number system so that the coding is the most effective and least amount of material is necessary for making a record. As a matter of fact, while I was trying to estimate how many punch -- you can see the size of that, of course, you can't tell the size too well here, the size of that card, but on that card there would be punched, a card that would lay on that thing there which is perhaps --

Q You got No. 1417 in your hand?

A I have 1417. The card that would lay on there would carry the data of ten base ten cards, carry the same data as ten base ten cards. So you can see it's an extremely excellent method of recording.

Now, the relationship of all of this to Clifford Berry's thesis. Clifford Berry's thesis took this process which we had along in this trough, you know, working on it. He had to have a thesis, and so he took this and for his thesis worked on various experimental approaches to the exact method of handling these processes and he succeeded in markedly improving them.

Q Then who actually wrote up the thesis?

A He did. He wrote his thesis.

Q Was it approved by you or by someone else?

A It was approved by me.

Q Was it --

A And by other people too, formally, but that is only in course, as we say. There wasn't any serious approval by anybody but me.

Q What was the relationship between these objects that are shown on Exhibit 1417 and the main machine?

A The objects which are shown on 1417 are objects which were used on the main machine.

Q What was the use thereof?

A The use thereof was for punching -- when we had a cylinder with 30, let's see, you see that cylinder had, in effect, 30 times 16 base 10 digits or 30 times 52, perhaps, base 2 digits, 30 times 52, 1500 -- say 1600 base 2 digits, a cylinder would carry at a single time 1600 base 2 digits, and at a single revolution all this material would be punched out on a base 2 card and retained there. Now, that is the function of it, and it enabled us, it furnished what is in effect a slow memory and one that could be easily retrieved and one that was entirely suitable for the purpose which we had in hand, that is, the process of solving linear system of equasions.

Now, as far as reading it back, we understand, really these things that appear in sight in figure 1417, the apparatus that appears there is really card handling objects. There is room back in the throat to put the punching and the reading mechanism in. I believe that I can assert these devices that in these photographs, the punching and reading apparatus is not in, it goes in the throat just before the card goes through the rollers, and it is not in position in either one of these devices here, but those were constructed and, of course, we used a high grade of materials, high grade materials, Tungsten spark points and the like so that that apparatus would be very durable and satisfactory and we never had any trouble with it as far as I am aware.

end.

L=59
14/1/1/59
WS

Q Referring to Exhibit 1417 and 1416?

A All right. It is right where it is supposed to be, I presume.

Q Will you describe the viewpoint that is displayed from one looking at the camera, at the objects in 1417 and compare it with 1416, please?

A Well, 14 -- I think that anyone looking at those two pictures would tell what the relationship was very easily. 1417 was taken from an angle of 45 degrees towards, from what I will call the pin end of the device. I am going to name the ends of the device the pin ends and the pin end of the device is toward the observer in 1417 and the pins of the two pins sticking up there. I have got to have some language if I am going to start describing such things as that. On the other hand, the rollers are in sight in 1416, the rollers are in sight and towards the observer. All right. 1417 is taken from the pin end at an oblique angle of perhaps 45 degrees. 1416 is taken from the roller end and not quite straight on, either, but nearly straight on, and shows the rollers. They are ground, hardened and ground steel rollers which carry the paper through very accurately and we found accurately within a thousandths of an inch, as far as that goes.

Q Where in relation to the object shown on H-1416 or 1417 would the positions have been for these tungsten points that you mentioned earlier?

4/1/2/60

A Now, look at 1417. Would you like to have me make sketches? You want words, don't you?

Q If you can do it in words, Dr. Atanasoff.

A I will do it in words. Heck, I will do it in words. Look at, take 1417. You can see the rollers in the background. Just towards the pin end from the rollers is what I call the throat. Into that throat will go the punching and reading electrode, and there's room in there. The room in there is just below the rectangular bar which you find above and slightly towards the pin end from the rollers.

Q And referring to No. 1418, the view from below that you have previously made reference to --

A Right, yes, sir.

Q Where with reference to any object that can be described in words on that Exhibit 1418, would these tungsten electrodes be inserted?

A They would be inserted -- now, on the pin end, you were looking upward from below, these devices, and the pin end is generally towards the right and top of the picture. The roller head is shown there clearly. The reading point would be located towards the pin end from a point, from the position of the rollers, but contrary to the appearance here, the center of the spark or the sparking points would be just at the top of the, not at the bottom as it would appear from this

14/1/3/61

photograph, but just at the top of that plate which exists there and up towards, which you are looking in this photograph.

Q Referring to Exhibit 1417, can you tell us which of the two plates that show in that photograph has the bottom that shows in 1418?

A I have to figure a moment, I am afraid.

Q All right.

A Well, I guess -- Yes, I know. You notice in 1418, you notice the bottom part of that aluminum plate shows scratches, but it also shows a reflection of the devices which were housed below. You can see them if you look there. That shows us that there are two aluminum plates in the picture divided by the angles and passing diagonally across the upper left-hand corner.

Q There are three objects that appear in the upper left-hand corner of Exhibit 1418 running along that diagonal line that you have just mentioned, I think?

A Yes.

Q What are those?

A Well, I notice that from the other pictures. Look at the picture, look at figure No. 1416. Do you see those angle irons, those ends that appear there? They traverse the length of the machine and support the parts, and they appear at the upper left-hand corner of figure 1418. They appear diagonally across the upper left-hand corner of 1418.

14/1/4/62

Q Then if we were to take Exhibit 1416 and count from left to right --

A Right.

Q One, two, three, four angle irons down below the rollers that are in the picture?

A Right.

Q Is it one or another of those angle irons, one, two, three or four, that shows up in the upper left-hand corner of 1418?

A It's a pair of them. It's number two and three, I believe.

Q Counting from left to right on Exhibit 1416?

A Yes. Now, look up there in that diagonal corner and you can see a pair of them there, I believe. Of course, I am not -- yes, I believe it's that way.

Q And then directing your attention to Exhibit 1418 and the solenoid that you have previously described or the cylindrical appearing object --

A Right.

Q -- where, with reference to Exhibit 1416, would that be located, again referring to these angle irons from left to right as one, two, three and four?

A It would be located towards number one angle iron at the left of 1416.

14/1/5/63

Q Would you gather up the photographs, please, and put them back in Exhibit F-1-D from which I believe they came, and turn your attention now, please -- Excuse me. Do you have the folder all right?

A Yes.

Q I turn your attention now to a different sequence and I am looking for Exhibit C-3.

A C-3?

Q Yes.

A C-3 is in hand.

14/2 starts

Q And I am also placing before you Exhibit F-6, so that you have before you C-3, F-6, F-1 and F-1-A, and will you turn in Exhibit C-3 to document number 217, please. Do you recognize that as a carbon copy of a letter of August 5, 1942, to Mr. Richard Trexler?

A It was a letter by me.

Q That is a letter that you have heretofore described in the course of a previous examination?

A Right.

Q The letter says, "You will find enclosed a description of our computing machine," in the first sentence, of which I have only read a part?

A Right.

Q Will you refer now to Exhibit F-6, please, document number 0489 through 0524 and tell me in whose hand 0489 through

14/1/6/64

0524 is written?

A In the hand of Clifford Berry.

Q Do you know when Mr. Berry wrote 0489 through 0524?

A During the first five or six months of 1942, perhaps seven months, I don't know.

Q Will you look through the sheets that are included in that No. 489 through 524 and tell me whether or not on the first sheet you are able to observe any writing that you can identify as yours?

A First sheet, no, I can't see any at first glance.

Q Do you have a recollection, apart from looking at this document sheet by sheet, of yourself having had written anything on the writing of Mr. Berry's?

A Oh, yes. You see, I corrected it. Now, may I say that this doubtless wasn't Clifford Berry's first draft of the thing. He probably had another handwritten draft before this, and I probably corrected that handwritten draft much more extensively. By this time, Clifford Berry was writing this at my instance. We had a number of discussions, one or two of them slightly unhappy, I remember. I hated to have him give him the word abacus for the condenser banks which carried the numbers and he was determined to do so, give it up, and this is a little minor thing, not of much consequence, but that instance is clear in my mind in discussion, and he also didn't call that device which adds and subtracts an

14/1/7/65

add-subtract mechanism, but I don't know, there is another name for it that you will find here, I think computing element, something of the kind, but I was following his work with great care and penciling it and correcting it from time to time. I believe maybe somewheres in here you will find some corrections in my hand. Now, here on page 494 you will find two words written by me.

Q What are they?

A "Do not overload the plate circuits." Instead of "affect" I put "overload." You see it is not a very brilliant correction, but it was by me. 495 -- but this was, our typing available, in spite of the presence of Mrs. Berry, wasn't too easily used for scientific purposes. You will find on page 500 some interlineations of numbers by my hand, but this was in good shape at that time.

Q Can you tell whether or not this handwritten document was prepared before August 5, 1942, the date of the letter to Mr. Trexler, or after?

A Oh, it was prepared before. Without any doubt, it was prepared before. You see, it would be prepared and then would have to be typed, and this is the material which was sent to Mr. Trexler, so there's no question about it being prepared before.

E15-1

Q Then would you turn to Exhibit 525?

A 525. Yes, I have it.

Q And in Exhibit F-6?

A I have it.

Q Is that a document that is stapled together presently?

A Right.

Q Had it been historically stapled together, can you tell by observing it or hadn't it?

A Well, no. Historically it was stapled together but it has been separated for reproduction and then restapled.

Q How can you tell that?

A Well, look --

Q I know. But the Court isn't looking at it now.

A You want some words to go into that machine?

Q That's right.

A There is an old rusty evidence of a staple on both sides of this document.

Q Is Exhibit -- excuse me one moment. Is Exhibit 525 multiple pages but only the first of which has been numbered with the numbering machine for identification purposes?

A That is true.

Q How many pages are there?

A There are 20 pages here.

Q And would you look at Exhibit 526 and tell me if that is -- tell me what is 526?

A 526 is a carbon copy of 525.

Q Again ,is that a 20-page document?

A It is a 20-page document, yes.

Q All identified for these purposes with a single number on 526?

A It is, yes.

Q And what about 527?

A It is another document.

Q Is that again a 20-page document only the first of which has been given and identification number?

A Right.

Q Then on 528, is that a 17-page document only the first of which has been given an identification number of 0528?

A It is.

Q Now, with reference to these documents 525, 526, 527, and you say now, or 528, which if any thereof were referred to in the letter to Mr. Trexler of August 5, 1942, as a description of, "Our computing machine"?

A I don't have any doubt that it is 525, 26 and 27, a common typing, I believe. I will have to examine this closely, but I believe it's a common typing that is referred to in the relation, so I have three copies here and

probably four copies were typed and one copy went to Mr. Trexler.

Q Now, at some time or another were some patent drawings or patent type drawings made up and sent to Mr. Trexler?

A They were.

Q Have you attempted to locate all of the drawings that ever were created in connection with a document such as 525 or those others in this exhibit F-6?

A I have.

Q Have you included in the files which you have brought here and which heretofore have been identified, all of such drawings in this respect that you have been able to locate?

A I have.

Q Do you now know that there are certain internal references to drawings in the write-up sent to Mr. Trexler?

A I do.

Q That you cannot locate corresponding drawings for?

A Yes. We are short drawings, and we, a party to sending -- besides Clifford Berry being a party sending this material to Trexler, Mr. Legvold became involved.

Q Referring to Exhibit F-1-A, can you tell us whether any of the documents contained therein represent documents that were sent to Mr. Trexler?

A They do.

Q And can you go into that folder now and give us an identification by number with any assurance that you are going to be correct or you are going to have to resort to make certain?

A It is my opinion that all of the drawings that are contained herein were sent to Mr. Trexler. Now, of course, you know the drawings before you are of two kinds, one were original patent drawings illustrated by this, which are drawn upon -- which are drawn in ink.

Q Illustrated by this, you say, referring to number what?

A 1441. And then there are reproductions of those by photographic process to a slightly reduced scale which are illustrated by items No. 1438 and others like them. The ones that were sent to Mr. Trexler were the, at first, were the photostat reproductions of these drawings. It is clear that I do not have in my files a complete set even of those, the original drawings, even of those which Mr. Trexler says he reproduced, I refer to 1446 on which a list of drawings is given.

vL=66
5/2/1/66
EA

Q And have you made a search for the drawings that are listed on Exhibit 1446?

A I have but it has been some time ago and I am not quite sure. I will have to do so again at leisure because my memory fails me about what happened when I made that search.

Q All right. Do the identifications that are on 1446 in letters and numerals correspond to similar identifications on drawings that existed at one time?

A Yes. The only point being that on some of these drawings you will find drawing numbers written in pencil even though the drawing is in ink. This is because -- I don't know whether this is a common practice among patent attorneys or not, but it apparently is because sometimes they wish to revise their list of drawings and it's easier to do so if the drawing numbers originally signed are in pencil. Now, let's see, we will take just those that I have in here. Now, here I have drawings which I have at hand are seven and eight--

Q Excuse me. If you would give the identification number assigned for identification in the course of this proceeding?

A All right. Good. I will. 1441, seven and eight, and I make notes to jog my memory.

Q You are saying 1441 includes?

A 1441 includes seven and eight.

Q Figures seven and eight?

15/2/2/67

A It does. Yes. 1444 contains twelve.

Q Again is that figure 12 you mean?

A Figure 12. 1445 contains figure 20. 1442 contains nine.

Q Again, figure 9?

A Figure 9. Thank you. Now, I suppose we will have to -- now, here is figure 11-A, B and C on other documents, 1431 is 11-A.

Q Did you say 1431, Dr. Atanasoff?

A 41, 1441 -- I am sorry, it is 31, 31 is 11-A. 1432 is 11-B and 1433 is 11-C. Now, this includes all the drawings which Mr. Trexler says he has had.

Q Will you look at the other --

A Form of drawings?

Q What I would call negative photostats because they are white on black?

A Yes. That's all right. They are negatives of the original. They are, yes.

Q And give us the current identification number and then the internal figures to which each respectively refers?

A Right.

Q Can I help you hold them?

A Yes. I expect you can. 1434 contains figures 1, 2, 3, 4, 5 and 6. Let go.

Q Also 7 and 8?

15/2/3/68

A I am sorry. Yes, of course, 7 and 8 at a reduced size, right. Thank you.

And figure 1440 contains figure 20 and figure 1435 contains figure 9 and figure 1439 contains figure 12.

Q If you are making a note you had better make your note.

A Now, 36 contains figure 11, again, and 11-B 1437 and 11-C 1436. I guess that's 11-C. Yes. Now, this is exactly the list that Trexler said he received. As far as I can see this is exactly the list Trexler said he received.

Q Now, do you know whether or not other drawings existed that are not contained in the documents you have brought with you to this deposition?

A I know --

Q Of this sort that we are presently discussing?

A Yes, I know. I know that, by my memory I know that other drawings were produced.

Q And if --

A But I am not sure, they were produced very late in the course of 1942, and it may well have been that they were not transmitted to Mr. Trexler. I do not state that all of the drawings here were produced. I do not think they were. I believe that a start was made on these drawings, and as drawings came to some end, which is outside of my files.

W-16

Q All right, sir. I think the time has come when you have indicated that you need to pack up and get ready to head back East and it's agreeable with me if we go off the record after I first put on the record my request that we reassemble these files and then when we are off the record, I will help you get them back in your suitcase for security and custodianship.

MR. DODDS: I would like to make a request that the chronological notes to which the witness referred at earlier sessions be available at the next session.

MR. HALLADAY: They will be.

THE WITNESS: Do you know what the chronological --

MR. HALLADAY: Yes, I think so.

(Whereupon the deposition was adjourned to December 3, 1968, at 10:00 o'clock A.M.).

* * *

VOLUME VI

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

Honeywell, Inc., Plaintiff, -vs- Sperry Rand Corporation and Illinois Scientific Developments, Inc., Defendants.	4-67 Civ. 138

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 10:30 o'clock A.M., December 3, 1968.

(APPEARANCES AS HERETOFORE NOTED)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (CONTINUED)

MR. HALLADAY: On the record. I had said during one of the days of the prior sessions of taking Dr. Atanasoff's deposition that for convenience I would have some of the photographs marked on their face which had theretofore been marked on their back, and during the recess I also asked the court reporters to come up here and to put their official court reporter exhibit identification on the copies that had been made for inclusion with the original of the deposition, and I believe that the court reporters have now accomplished that task, and I believe that what now constitutes the original of the exhibits as duplicated are all present here in this room.

I am not certain, because I haven't yet asked the reporter, and I am about to do that, whether in the marking they discovered any missing folders, and if so, if they made a record of them and if there are certain missing ones we will arrange to supply them so that the file for the Court will be complete.

THE REPORTER: There are no missing

folders but there appear to be some missing documents in some of the folders.

MR. HALLADAY: Then make a record of my inquiry to you, if you will, or if you have placed a mark in the exhibits where the documents are missing and we will undertake to supply whatever seems to have been for one reason or another omitted.

THE REPORTER: Yes.

12/3/68
K=1
WS-2

MR. DODDS: May I ask, I believe the original of these photographs had some of Dr. Atanasoff's on the back. Have those been duplicated on the copies?

MR. HALLADAY: I can't answer that question of my own recollection. The set that I am working with does not have that information on the back of it, but we will undertake to supply that information with whatever the appropriate copies are.

MR. DODDS: Okay.

MR. HALLADAY: Now, for further record reference, I personally labeled an envelope from that part of the file which is intended to be the Court's with my own marking F-1-D. I would like to have the court reporter simply validate that and I will back refer to it again so that we are sure we are talking about something that has previously been referred to.

(Atanasoff Deposition Exhibit F-1-D marked for identification.)

MR. HALLADAY: I have had the court reporter mark this now as Atanasoff Deposition Exhibit F-1-D, 12-3-68, W.S., for Ward Sutfin, and inside are the following numbered photographs, the numbers appearing on both the front and the rear and in the following order, so that I can help you have them assembled in the order they are now in in Exhibit F-1-D: 1402, 1403, 1405,

1406, 1407, 1408, 1417, 1418, 1416, 1409, 1414, 1410, 1413, 1415, 1411, 1412 and 1419. There should be a total, I think, of 17 photographs. Does that check, Mr. Shimer, with the copies which you have?

MR. SHIMER: Seventeen photographs, yes, sir.

MR. HALLADAY: All right.

MR. DODDS: I think, as I indicated before, these photographs which you have just identified in folder F-1-D do not correspond to the ones which the witness inspected and testified about, in that they do not have the notes on the back at the present time.

MR. HALLADAY: The current copies that I have just referred to in the record do not appear to have those notes on the reverse. I believe the copies before Mr. Shimer have had those notes put on by you gentlemen.

MR. SHIMER: Yes, I believe so.

MR. DODDS: Yes.

MR. HALLADAY: So that what I am proposing to do is to copy the notations onto the Court's exhibits that are identical with the information on the back of the exhibits that you have in your file. Then you will know that they are one and the same. Is this all right?

MR. DODDS: That is satisfactory.

MR. HALLADAY: Very well.

BY MR. HALLADAY:

Q Now, Dr. Atanasoff, turning to you, and just one minor point that I would like to clarify. I noticed in observing the typewritten transcript of your deposition that on one or another occasion you were quoted as using the word "commentator" in connection with a description of the computing machine or a computing machine, and I simply want to understand whether or not that was, if you said it, it was intended to be said or if there was a different word that you intended to say?

A I do not remember using the word "commentator", although I may have. I wonder if the word is "commutator."

Q Is there any use of the term "commentator" in connection with the machine that you were describing?

A Not to the best of my memory and belief.

Q There is the word "commutator"?

A There is such a word.

Q All right. In the course of your deposition, I had asked you to make reference to photographs that were marked exhibits 1402 through 1419, and I now place before you Atanasoff Deposition Exhibit F-1-D containing photographs with those serial numbered identifications on them.

First, I would like you to observe this

with me. Are they assembled in the following order: 1402, 1403, 1405, 1406, 1407 --

A Wait a minute.

Q Excuse me.

A Go ahead.

Q 1408.

A Go ahead.

Q 1417, 1418, 1416, 1409?

A Right.

Q 1414, 1410, 1413, 1415, 1411, 1412 and 1419?

A They are.

Q And have you for convenience put those numbers on adhesive stickers on the face of each of the exhibits which you now have in your files?

A The ones I have now in my file have those numbers on the face on adhesive tape, not in my handwriting, however, but they do have these numbers.

Q That is the file that you have before you that I just handed you, F-1-D?

A Right.

Q Did you do likewise with your retained copies of these or have you --

A You know there is a slight difference in this list, I believe. I don't know whether there is or not, but we will have to verify this.

Q All right. What I would like you to do is --

A Can you get those in the same order? Could you get those in the same order? 1402, 1403, 1405, 6, 7, 8, 1417, 18, 16, 9, 14, 10, 13, 15, 11.

MR. FALLON: I don't have 11. We have 12 and 19.

THE WITNESS: And 12 and 19. All right. Eleven is missing from mine. I don't think it is missing from my file of negatives, it's just missing from this file of reproductions.

BY MR. HALLADAY:

Q All right. And included in the series in your original file there is no number 1404 in this grouping?

A 1404?

Q Right.

A There is not, as I have them here.

E-3-1

Q All right.

A You know that in my file there is in no sense an original file.

Q I understand. I am referring to the file as you brought it as an original file to distinguish it from the one that has been reproduced specifically for reference in the course of this deposition.

A Yes. Right.

Q Then I want to ask you this: Whether on your own retained copies of Exhibits 1403 and so forth, you had put on the face of them the numbers and if those numbers on your originals correspond to the numbers on the copies that you now have before you.

A All right.

Q Photograph by photograph.

A One, two, three, four, five, six, seven, eight, 17, 16, 9, 14, 10, 13, 15, 12 and 19. They do now except for the one.

Q Then in the file before you marked Atanasoff Deposition Exhibit F-1-D, 1411 appears not to duplicate a photograph in what I have been referred to as your original file, a similar collection?

A 1411 occurs in that group, doesn't it?

MR. FALLON: Not in what he referred to

here.

THE WITNESS: The answer is no.

BY MR. HALLADAY:

Q All right. Would you, however, reinsert it in F-1-D between 1416 and -- excuse me -- between 1415 and 1412?

A I have done so. Is this one -- all right. I have done so.

Q All right. Now, in the course of the previous testimony which you had given, I had presented to you these photographs in a certain order and asked you to reflect on the same and to describe whether or not you thought those reflected the progress of construction of the main machine from time to time or the sequence of same, and in a general way, at least, you answered that you couldn't do that without reflection. Now, that may not be exactly what you said,but that was the burden of what I understood you to say. Did you say essentially that or did you say something different than that?

A I believe I said essentially that.

Q All right. Would you now look at the photographs included in Exhibit F-1-D, 1402 and so forth, in the order that we have heretofore put on to the record this morning and tell whether or not the current order of the photographs does or does not reflect at leastin a general way the sequence or progress of the construction of the main machine from time to

time?

A They do.

(Atanasoff Deposition Exhibits V, W, X marked for identification.)

BY MR. HALLADAY:

Q I have put on the board here in the room, Dr. Atanasoff, Atanasoff Deposition Exhibit U which is an enlarged version of a portion of the prototype as I think we had called it which is shown in its entirety on Exhibit T which I am also putting on the board just for reference, and I don't believe I have asked you the specific question whether or not you yourself had a hand in the preparation of Exhibit U.

A I had a casual hand in it. I was aware it was going on and it represents an enlargement of a portion of Exhibit T and so indirectly I had a hand in its preparation.

Q You have already told us what part you had in the preparation of Exhibit T?

A Exactly.

MR. HALLADAY: Would you, please, Mr. Allegretti, put Exhibit V before the witness so that he can have it.

BY MR. HALLADAY:

Q Examining Exhibit V as it is before us here on the board, can you tell us what, if anything, you had to do with the preparation of that exhibit?

4

A This exhibit was prepared by draftsmen from photographs and from discussions with others, but I had played the following role in the preparation of that. At each stage of the development of this drawing by patent draftsmen, I have marked the structures presented there and have verified that they are the same or the substantial equivalent of structures which are contained in photographs or as have been known to me, known to me to be elements of the structure of the original machine.

Q And with respect to the add-subtract mechanism that appears on Exhibit V as if it were physically removed from the main frame and which is labeled in the lower right-hand corner, did you have a hand in deciding to have that display made in that fashion?

A I did.

Q And with respect to the figures that show up on that display of the add-subtract mechanism, I have heretofore been using the term tubes. You have used the term envelopes, and the label there says, "7 dual triodes."

A Yes.

Q What is the meaning of that reference?

A A dual triode is a vacuum tube which contains within a single envelope three thermionic -- two thermionic triodes and these tubes possess that property.

Q And directing your attention to the reproduction or

representation on the drawing Exhibit V of the dual triodes in their apparent removed condition in the lower right-hand corner of Exhibit V, can you tell from where you are sitting whether each of the seven dual triodes appear or does not appear to have a grid cap?

A As I view that drawing, they all have grid caps but one tube does not have a lead to the grid cap.

Q That is on the one that is exploded from the pictorial representation?

A Right. And it's a tube that is mounted somewhat centrally between two other rows of tubes.

Q Then directing your attention to the other tubes or envelopes, and if we count from top to bottom in the first column of them to the left, one, two , three, four, five, may I call them modules for a convenient reference?

A That word is acceptable to me.

Q In that first bank of five, the top one there appears visible only how many of these envelopes or tubes in it?

A Two are completely visible and one is partially visible.

Q And then below that in module No. 2, reading downward in the left-hand column, how many triodes are visible?

A You mean how many triodes or how many envelopes?

Q Well, if we use the term dual triodes, and I say triode, my intention is to speak of one envelope, or my

language one tube?

A Yes. But you shouldn't use, I do not mean to correct counsel, but you shouldn't use the word one triode as equivalent to one envelope.

Q I should not?

A You should not.

Q All right. Then I will try to be as precise so that we don't get confused.

A Because, you see, as a matter of fact, this will prove confusing because there are two triodes in a single envelope and that will be confusing.

Q All right. Referring to Module No. 2, according to the designation which I have been employing which is the second one down in the bank on the left?

A Right.

Q To which you are pointing, and I am also pointing, how many dual triodes are represented there in Exhibit V?

E-3-2 A Seven.

Q And in that pictorial representation do all of them have both grid caps and leads?

A They all have grid caps but the center tube, again, as far as I can discern from my view of that, of the drawing, does not have a grid lead.

Q With respect to module No. 3, again counting downward in the same fashion, does that appear to have a grid

cap and lead on the centrally located dual triode?

A It appears to have a grid cap and lead. Yes, sir.

Q Now, with respect to that, is that an inaccuracy in this reproduction?

A That is an inaccuracy in the drawing, in the original drawing, and therefore in the reproduction thereof.

Q Then with respect to these modules of the dual triodes, can we count 35 of them? How many can we count on Exhibit V?

A How many modules?

Q Yes.

A We can count 14 -- no, 15 in sight.

Q Fifteen in sight. And then on the machine proper how many modules were there altogether?

A There were three modules. Yes, modules.

Q Then immediately to the left of the first bank of modules to which I have been referring and pointing, there is an appearance of an upright member of some kind, am I correctly describing it?

A There is.

Q Then immediately to the left of that are some objects. What do those objects -- what are those objects?

A The objects to the left of that vertical member?

Q Yes, sir?

A Those are representations of the types of vacuum tubes

which are located on the other face of this structure.

Q Then in the main machine when there were all of the modules assembled in place, how many were there?

A There were a total of 30.

Q And as to each module, how many of the dual triodes had grid caps and grid leads?

A They all had grid caps because they all were identical dual triodes. On each module, one centrally located as shown in the picture to the lower right, does not contain a grid lead but all of the rest do.

Q So that if in examining Exhibit V there is an apparent representation of a grid cap and lead therefrom for the centrally located tube on each module, is this simply a matter of an error in the drawing itself?

A It is.

Q Can you give us your best memory, Dr. Atanasoff, as to the approximate time at which the main machine, as we have been referring to it, attained the condition that is reflected by Atanasoff Deposition Exhibit V?

A With two exceptions, this machine attained this form, essentially this form during the summer of 1941.

Q And the two exceptions are what?

A I notice that this machine seems to carry the complete array of the boost and carry drum and seems to carry the complete timing control contacts which were --

Q Both of which are so labeled on Exhibit V?

A Both of which are so labeled, and which were perfected and placed on the machine after the summer of 1941.

Q You have heretofore said something, Dr. Atanasoff, about the time at which the prototype generally reflected by the Exhibits T and U, one of which is on the board?

A Right.

Q Was dismantled or eliminated or someting of that sort. Can you tell me now what your memory is as to approximately when that event occurred?

A The prototype became operational late in '39 and was operational in the, a similar function could be performed by the main machine as indicated by Exhibit V, as indicated in general by Exhibit V, but not exactly because certain parts were missing, and then it was dismantled and the date on which it was dismantled, according to my best memory, may have been May of 1940.

4/1

Q After its dismantling, do you know what happened to the parts that were dismantled?

A Some of the parts were cannibalized and reused in building the main machine, and some of the parts were otherwise disposed of. I do not know how.

Q Do you know of the whereabouts of any of the remains of that prototype?

A I do not.

Q Have you made any effort to locate same?

A I've made a diligent search for same.

Q From the time of the dismantling or elimination of the prototype, did you conduct any tests from time to time during the construction of the main machine on its computing activity?

A We did.

Q Who participated in those tests?

A The principal participants were Mr. Clifford Berry and myself.

Q And you have heretofore described the tests as they were employed in connection with the prototype. Can you tell us how the tests were conducted in the process of the construction of the main machine?

A I can.

Q Will you do so?

A It's a rather surprising comment that even at this

stage of the development of this machine, I was aware that the data in data out devices were giving me more trouble than most other parts of the circuit. We only had available to us very crude methods for data in and data out and these methods have been described in the prototype, and the same methods of data in and data out were here employed in the original testing of this machine. The logic circuits had been worked out, and, of course, we had basic tests which we employed on the logic circuits, and for the sake of having a description of the process that adheres to some logical system, I will describe the testing of the add-subtract mechanisms first.

These mechanisms were tested statically on a test bench, aside from the machine itself, not as a part of the machine itself, but as a separate entity. This was done by a test set which exposed the add-subtract mechanism to the inputs which it would receive on the machine and recorded as outputs from the add-subtract mechanism the outputs which it would yield if it were operating in the main machine. I recognize the objections to such tests which will be made. It will be said that such tests are not dynamic. In this matter, even in those years, we were well aware that the difference between dynamic and static tests in a vacuum tube structure such as the one indicated in the lower left -- lower right-hand corner of Exhibit V, and static tests thereof at

the dynamic speeds to which the machine depicted in Exhibit V would expose these units, leaves little choice; in other words, the static tests have great validity for the dynamic situation. This might not be true if the speed were enormously increased as compared with the speed at which Exhibit V was designed to operate.

But on the other hand, these static tests had much to recommend them because they got the units one at a time out on the bench so you could have them upside down and do the tests with the inner workings of the device at your very fingertips, and so you could locate misperformance and correct it as the occasion demanded.

In this way, all of the 30, more than 30 units, part of which would be on the machine at one time, 30 of which would be on the machine at one time and two or three additional spares would be provided, were tested and adjusted so they would perform according to the logic which was required of the add and subtract mechanism.

Q You have said something, I think, in your discussion about a test set?

A I have.

Q Or something of that sort?

A I have.

Q Can you describe the test set --

A The test --

Q -- that was employed during that period of time?

A The test set was located in a little box, a little tin box such as is so common in the electronics of yesteryears, maybe two inches high, five by eight inches, or some such size, it makes little difference, and in this device and mounted thereon were provided, for instance, transformers to provide the correct filament voltage for the module under test. This box also had a power supply providing the power voltages which are necessary for the performance of the add-subtract mechanism in test.

It also had additional circuits which provided the input, the inputs which these logic circuits, the add-subtract mechanisms themselves would receive in the course of the actual operation on the machine.

And then in addition to this, means were provided for measuring the outputs which were obtained from add-subtract mechanisms. As of that date, the outputs of add-subtract mechanisms were measured by two moving needle meters which were attached to certain leads, certain leads of the add-subtract mechanism.

Q Were those -- Did you call them needle --

A Moving needle meters.

Q Were those needle meters physically incorporated into the test set or mounted on it, or how would we get a visual picture of what it was you were dealing with?

A The box was provided and it contained everything but the meters, but the meters were just fastened to the leads. The meters were provided with their own individual containers and they rested on the bench, so you would have to observe the motion of the needles in order to tell the output of the tests, of the test, the results of the test of the output of the add-subtract mechanism in the course of tests.

Q What means was provided in connection with that test set for supplying the voltages to the add-subtract mechanism?

A Well, they had a normal, a transformer which furnished an output voltage of, well, after filtering and rectifying of perhaps 120 volts plus and 120 volts minus. This -- when you say a power supply that would provide these filtered rectified DC voltages, why, you pretty sharply describe the situation.

Q How did you employ this test set in the actual testing? Can you describe what physical movements or manipulations you had to engage in to accomplish a test?

A Well, you -- the add-subtract mechanism itself was provided with a male multi-lead plug. The test set had a cable attached to it and on the end of the cable was a female multi-lead plug, so the two would articulate and join.

In testing a unit, you did join them. Thus, the unit received the voltages necessary for its

operations as soon as the AC plug attached to the test set was plugged in the mains, the source of AC current which was present in the room.

Then you connected the meters at the proper places. There were on the test set three buttons, and three buttons were provided. The add-subtract mechanism, it has been intimated, and it will be further described, I believe, contains three input leads. These input leads receive impulses from three different sources. There are three buttons. The three buttons correspond, imposing upon these input terminals voltages which correspond in the code employed at the time to the zero and the one of the base two number system. By manipulating the proper buttons, by pushing, if the buttons were not pushed, they gave zeroes, but if the buttons were pushed, the corresponding lead received an impulse which corresponded to a one in that particular code.

By manipulating the buttons, we could test the add-subtract mechanism under all conditions of input signals which were pertinent to the problem at hand and according to the codes of the day.

In addition, the add-subtract mechanism had two other terminals which were supplied with voltages which in code told the add-subtract mechanism to add or subtract. When the voltages were coded in one way, the machine would

add, and when they were coded in a different way, the machine would subtract.

A provision was made on the test set for a moving mechanical element which, when moved into one position, would provide that voltages would be supplied to the add-subtract mechanism which would induce addition by that unit, and which, when moved in the other direction, would adduce subtraction in that unit.

Q In connection with the test set, was the test so devised as to accomplish any regulation of the voltage?

A At that day, consideration of the problem of regulation had taken place and it was decided that the test set would work sufficiently well if monitored by a voltmeter, but not a supply -- but not -- but the test set -- it would be satisfactory if the test set did not itself contain any voltage regulating elements, and it did not, as of that day.

It may be said that the problem of voltage regulation was, rested heavily on the minds of the designers of this apparatus and the choice of the structure of add-subtract mechanisms as of the day was such as to provide the greatest range of voltages -- may I correct that -- a great range of voltages under which the machine would give exactly the right results. It was recognized that the structure of the -- the larger structure of the add-subtract mechanism could have been simplified if we had accepted

operation of this device under a lesser range of voltages, but this choice was not made. The contrary choice was made.

Q You have heretofore testified, Dr. Atanasoff, about applying for funds to support this project?

A I have.

Q Did you ultimately or did the University ultimately or a foundation connected with the University ultimately obtain such funds to support this project?

MR. DODDS: Objected to as leading.

THE WITNESS: The funds to support this project were secured at various times and dates from the University, and finally, funds were obtained from an outside organization to fund this project.

BY MR. HALLADAY:

Q What outside organization?

A The Research Corporation, a foundation founded by, oh boy, -- well, the name of the gentleman escapes me at the moment.

MR. DODDS: Cattrell?

THE WITNESS: Cattrell, by the Cattrell interests. Thank you, Mr. Dodds.

BY MR. HALLADAY:

Q Prior to the time that that grant was actually received from the Resource Corporation, did any representative

thereof come to Ames, Iowa, for any purpose?

A He did.

Q What was that person?

A To see what the nature of the apparatus --

Q My question was certainly a poor one. Who was the person?

A The person was, one such person was Mr. Sam Caldwell who at that time directed the operation of the differential analyzer at the Massachusetts Institute of Technology, and who was therefore considered a foremost figure in the computing art as of the day.

Q Do you recall approximately when it was that Mr. or Dr. Sam Caldwell visited you at Ames, Iowa?

A Oh, early in the year 1941.

Q Do you recall on that occasion whether he was alone or accompanied by somebody?

A I believe on that occasion he was alone, to the best of my memory and belief.

Q Do you recall how long he stayed there on that occasion?

A Overnight; a couple of days, perhaps.

Q And was Mr. Caldwell back there after that?

A He was.

Q On how many occasions, if you can recall?

A Oh, three or four or five.

Q Do you remember the next occasion when -- is it Dr. Caldwell or Mister?

A Dr. Caldwell.

Q When, if you can remember, was the next time Dr. Caldwell was back to Ames?

A I believe that he came again before the end of 1941, but the exact date thereof, I do not have in mind.

E-5-1

Q On any occasion while Dr. Caldwell was there in January of 1941, did you demonstrate in any way the main machine in its then condition to him?

MR. DODDS: Objection. The witness did not testify Dr. Caldwell was there in January of 1941.

BY MR. HALLADAY:

Q On the first occasion when Dr. Caldwell was there, whenever it was, did you demonstrate in any way the main machine to him in its then condition?

A I did.

Q Can you give us a verbal picture of that demonstration?

A Well, the demonstration was equivalent to the demonstration that I started to give awhile ago and generally equivalent to the demonstration which I have described as having been given on the prototype, but I have not completely described the demonstration which we gave on this machine and so I cannot refer to that, and I will have to go through details at this time if you wish.

Q Will you do so, and when you say this machine you are referring to what?

A I am referring to Exhibit V.

Q All right.

A And the machine which is represented by the drawing in Exhibit V and physical machine which is also portrayed here in photographs starting with photograph 1402 in Exhibit F-1.

Q D.

A What?

Q F-1-D.

A F-1-D. I am sorry. Now, I have described the testing by test set of the add-subtract mechanism of this device, and Iwill make a general description of the methods of illustrating the operation of the machine in further detail at this time as allied to Mr. Caldwell, but it will be closely followed. This was a routine which we had developed for the purposes of checking out and illustrating the operation of the machine. You will remember that I pointed out that the condensers, that the condensers were sufficiently good so that you could place a charge on the condenser by merely touching the condenser lead on one of the drums, either the KA drum as indicated here, drum No. 2 in the Exhibit V or the CA drum, drum No. 1 in Exhibit V, touching the terminal. Now, you needed to touch the terminal, if the terminals were at zero potential, this would, in the coding of the day, this would represent to a sufficient degree of precision a zero in the number system, and in order to get a one in a number system you had to apply a negative voltage to that terminal and if you had a B battery with, say, 60 or 90 volts, and if you provided yourself with a high voltage resistor in series with your lead so you wouldn't short circuit the B batteries, B batteries being expensive and hard

to come by, then you just touch that lead to the exterior terminals of drum 1 or drum 2 and you could put one's on any terminal which you touched. And in this way, the drums were charged with -- electrically -- in such a way as to represent numbers in the base two number system.

Now, there was provided, as is depicted in Exhibit V, a bank of tubes to which I will point and which is located in the central portion of the picture and which has a lead, which has a legend attached called, "Memory regenerating circuit." It is a group of tubes located in the back, and this group of tubes has been otherwise described by exhibiting a photograph of Mr. Berry holding a bank of tubes in his hands and it was this bank of tubes which Mr. Berry was holding in his hands, and it is -- I will have to do reference -- well, there is in the photographs which I have supplied to this case such a picture of Mr. Berry holding this bank of tubes in his hands.

Q Would you look at Mauchly Exhibit GG?

A I do. I have looked at it.

Q Is that is that not the photograph you were speaking of?

A That is the photograph to which I am referring. Mauchly Exhibit GG? GG. Now, when the system was operated, when the motor was started, the drums would start to rotate and certain brushes -- let us first consider drum No. 2 --

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certain brushes bear upon the contacts of Drum No. 2 and through the agency of these brushes and through the agency of the device which I have described as -- as has been otherwise described as memory regenerating circuits, the charges on these condensers would be regenerated and they would not decrease with time but their full strength would remain within reasonable limits and sufficiently accurate limits for the purpose at hand, and this fact would represent such a test -- would represent in itself a test of the agencies herein described, and this was a demonstration which was made.

This demonstration is sufficiently described by my previous words except that I should now say that it was necessary to attach a cathode-ray oscilloscope to a certain terminal, a certain brush terminal on Drum 2. This brush terminal being otherwise described as the last terminal contacted in any given revolution by the drum, and this terminal is not a terminal of unduly low impedence, and so that the attaching of a -- the terminal of a cathode-ray oscilloscope to this point does not otherwise disturb the circuit, and then if the sweep circuits of the cathode-ray oscilloscope are suitably interrelated to the rotations of the drums, the picture on the oscillograph tube will depict the numbers which reside on drum No. 2, and with this interpretation we could verify that the numbers on Drum No. 2

were sustained by the regenerative circuit and did not degenerate with time. That was a part of the demonstration which was given.

Now, similar remarks apply to Drum No. 1, but in this case there is no separate regenerative circuits. The regenerative function is performed as a matter of course by the mechanisms contained therein, hereinbefore described as add-subtract mechanisms, and these devices furnish the voltages which were necessary for the regeneration of the signals on Drum No. 2 and the method of tests was the same as before.

Q I think you said Drum No. 2?

A I am sorry. Correction. It should be Drum No. 1.

Q Were there other demonstrations?

A There were other demonstrations.

E-5-2

Q Describe them, please?

A One demonstration that was given was to demonstrate that the machine had the ability to add base two numbers. In order to perform this function, it was necessary to place on Drum 1 and Drum 2 by the methods described, arbitrary Base 2 numbers. I might add a detail which perhaps should have been emphasized before, that, of course, we will be working simultaneously with corresponding circles of condensers on each of these drums.

Since the first, normally speaking, the

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first circle of condensers on Drum No. 2 and the first circle of condensers on Drum No. 1 co-act with a certain add-subtract mechanism which can be labeled as add-subtract mechanism No. 1, and I do not remember where it was located in that assemblage of add-subtract mechanisms, and when things are arranged in this way, the numbers which were contained in Drum No. 2 would be regenerated as previously described and would remain on Drum No. 2 and likewise for Drum No. 1, the signals which were on Drum No. 1 would be regenerated by add-subtract mechanism 1 and would remain on Drum No. 1. However, we could close a switch here called the temporary one-cycle switch on Exhibit V by pressing our finger on it until the switch jumped inward and then quickly taking our finger away so as to not interfere with a later time when the switch would jump outward. In this way, for one cycle, there would be an inner action of Drum No. 1, Drum No. 2, add-subtract mechanism No. 1 and certain other parts of the circuit to perform an addition of the numbers of the number on Drum No. 2 into Drum No. 1 so that after this cycle there would appear on Drum No. 1 a number which is the sum of the numbers previously residing on Drum No. 1 and Drum No. 2, and this constituted the addition of numbers by this device.

Q How was that demonstration capable of being seen?

A Well, what had to happen, you then had to have a

cathode-ray oscilloscope on Drum No. 1 attached to the brush, to the second brush of Drum No. 1 and this -- and the motions of the oscilloscope would then depict the fact that the number on Drum 1 had changed and now corresponded to the sum instead of the original number which was on Drum No. 1.

Q Were there other demonstrations in connection with the main machine and Dr. Caldwell's visit there the first time?

A Another demonstration which was made at the time of Dr. Caldwell's visit was to do a subtraction and in order to do that the voltages being applied to the two terminals of the add-subtract mechanism No. 1 were suitably changed whereupon add-subtract mechanism No. 1 would think it was a subtracter instead of an adder, and the course of the experiment would otherwise be -- the course of the experiment and/or the demonstration would otherwise be the same, but after the actuation of the temporary one-cycle switch for one cycle there would appear on Drum No. 1 the difference of the number, which was formerly on Drum No. 1 after subtraction of the number which is on Drum No. 2 therefrom.

Q Were there any more of such demonstrations that were in existence at that time?

A Oh, at that time there would be, after having this operated with particular numbers, then a few special experiments would be performed such as the problem of having

Drum No. 1 empty and subtracting from it a single unit on Drum No. 2, whereupon the device would carry throughout its range and there would therefore appear upon all positions in Drum 1 a "1", a fact which would be depicted by a suitable representation on the cathode-ray oscilloscope which was attached thereto.

There were certain other experiments which I could describe. A common one was to put a number in a certain form on Drum No. 2 and have no number at all on Drum No. 1 and add this number in successively and notice after two additions why the number, the signal which appeared on Drum No. 1 would be the same in shape as that which appeared in Drum No. 2 except it would be shifted one base two position as a consequence of doubling or we could add it in four times and then it would have been shifted two positions. This was a common demonstration of the -- well, perfectly good demonstration of certain facts in the operation of the machine.

Q Are there any others that you can now describe as having occurred at or about the time Dr. Caldwell was there?

A No other demonstrations occur to me at this time.

Q By the time of Clifford Berry's thesis which you have heretofore identified as having been submitted, and when was that, approximately?

A During the summer of 1941.

Q By that time --

A The middle of the summer, July or something of the kind, the 8th, I believe the thesis had to be submitted by July 8 to secure the degree.

Q By that time had there been any progress in the construction of the main machine beyond that that it had when Dr. Caldwell was there earlier?

A Yes. You see Dr. Caldwell's demonstration was done with a partial array of add-subtract mechanisms. During that interval the rest of the add-subtract mechanisms were constructed.

Q At the time that Dr. --

A There --

Q Excuse me?

A There were other apparatus, during this interval, that was constructed. For instance, the base 10 card reader was constructed during that -- during the first half of 1941; the base two card reader and punch were constructed during that time, and I believe that the power supply, I mean the filament transformer which is indicated by the proper legend in Exhibit V was moved across the chassis. For certain purposes of the machine it was desired that the machine operate synchronously with the AC potential so a change had been made and instead of the motor being belted to the device as is depicted in certain photographs which have been

supplied, we now find the motor being geared to the high speed shaft as is indicated in Exhibit V, and we see the motor, motor indicated there, and a gear box which connects with the high speed shaft.

Q Can you describe in words now the work on the machine, its various stages of construction until the last time that you had anything to do with it while you were at Ames?

A Yes. I can make an attempt at that.

Q Will you do so, please?

A A great many additional appurtenances were added during this period. The exact circuit for punching, for base two card punching was selected and transformers provided in a box which is called, "Transformers for punching," given here.

Q On Exhibit?

A In Exhibit V. There was the boost and carry drum, and during the early experiments which were witnessed by Mr. Caldwell, there was only a part of the structure, but the complete unit was constructed and installed. A great deal of thought was -- let me say first, the, these units here which were constructed, as I told you before Clifford Berry's -- at the time of Clifford Berry's thesis, were installed permanently in the machine and geared thereto and interrelated thereto so that their relation would be controlled by the

operation of the machine. A great deal of thought was given to the matter of the overall control of the machine, and devices, therefor, were designed and constructed.

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They are in a position which is not visible in Exhibit V. There was located a panel containing devices for such control. The temporary one-cycle switch was removed therefrom, and this function was taken over by relays and other devices necessary for such functions; and another drum was provided, called timing control contacts for controlling the inner relationship of such controls with the other operation of the machine. It was necessary to interrelate them to the motion of the machine and it was the purpose of this drum to do this interrelation.

I believe I have run out of memory at this point.

Q When was the last time that you saw that machine, as nearly as you can tell?

A Well, I left -- I will try to be responsive here. I would say 1945 or thereabouts.

Q When did you leave Iowa, or Ames, rather?

A I left Ames for employment with the Naval Ordnance Laboratory in the later part of September of 1942.

Q And from that point forward, were you a resident at Ames or somewhere else?

A I was a resident in Washington from that point on. I maintained, for some time I maintained a voting residence at Ames, if you speak in that legal terminology.

Q I was thinking more in terms of living.

A Where I lived and ate was, of course, Washington, D.C.

Q And how long did you maintain Washington or its vicinity as your living place?

A Well, I have maintained Washington and vicinity as my living place until this very moment, I guess, in some sense.

Q As of the time you departed from Ames to go to the Naval Ordnance Laboratory in 1942, whenever it was, can you describe the then state of the main machine?

A Well, I think I have largely exhausted such descriptive material by describing the changes which took place before I left, before the end of the period when the machine was worked on. As far as photographic material, I can refer you to 1419 as representing rather awkwardly the appearance of the machine at the last time I saw it. Yes, 1419.

Q Do you have 1419 before you now?

A I do.

Q Is that the one that you intended to refer to in your testimony just previously?

A It was.

Q Will you look at Exhibit 1412 and tell us, if you can, how nearly, if at all, that shows the appearance of the machine as it existed prior to your departure, immediately prior to your departure for Naval Ordnance Laboratory

employment?

A It is a good picture thereof.

Q As of that time, can you describe how that machine then operated, if it did?

A At that time, the machine operated, of course, for addition and subtraction in the fashion which has been depicted. The one-cycle switch had been removed and in its place was functioning other mechanisms containing the controls which would enable the machine to add or subtract. Certain controls had been provided which would permit the machine to do a specie of division, and I say a specie of division because this was a function which I was reaching strongly for, a specie of division so as to eliminate one unknown from two equations whose coefficients were placed upon the cylinders thereof -- whose coefficients and constant term, correction, are placed upon the cylinders thereof. The data in and data out, the base ten data in device was operative and you could place a base ten card on the base ten reader and this card would be, this base ten number would be converted to a base two number and that base two number would be stored upon one of the cylinders, and this precise cylinder was the cylinder herein called CA, it being, corresponding to the drum number one. This is necessary because only CA will conduct a computation and computation was necessary in this machine for converting a base ten number to a base two number. The

controls were not otherwise operative. The base two data in and base two data out devices which were necessary for the effective use of the machine in a rapid calculation had been constructed, but the total of device and material had not been effectively cojoined.

Q By material, you mean what, sir?

A The paper which is used for the cards punched.

Q Is that something you have earlier spoken of as dielectric?

A You can speak of it as dielectric if you wish.

Q It seemed to me that you had earlier spoken of that yourself, and I wasn't sure.

A It's a good word for it. It has other properties besides those of dielectric, however, and I don't want, unless you desire a specific description of the paper problems, why, I will not launch into a description of the exact properties of the papers which are necessary for the purposes thereof.

Q I was only wondering whether when previously you had spoken of the dielectric, you were also talking of the cards you are now talking about?

A I believe this is true, yes.

Q All right.

A If that is all you wish. Now, the performance of these devices, but these devices had worked on occasions but the performance of these devices in toto was incomplete.

Q I noticed that while we convened at 10:00 o'clock and you have been sitting here this time, you haven't been testifying all that time, but it's now ten minutes of 12:00 and you haven't had a break in the course of the morning.

A I would like one.

Q Would it be agreeable if we take our noon break now and maybe come back a little early?

A Fine.

MR. HALLADAY: Is that agreeable with all?

MR. DODDS: Satisfactory.

THE WITNESS: We will be back at quarter to 2:00 or a quarter after 1:00?

MR. HALLADAY: Quarter after 1:00.

(Whereupon an adjournment was taken until 1:15 o'clock p.m., December 3, 1968.)

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December 3, 1968
1:15 o'clock p.m.

(APPEARANCES AS HERETOFORE NOTED)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

BY MR. HALLADAY:

Q Dr. Atanasoff, you have before you Exhibit 1419 and also 1412. Can you recall whether or not the last time you saw the main machine it was or was not in the condition or approximate condition reflected by those two photographs?

A I cannot verify that all of the structures which are present in these photographs were on the machine the last time I saw it.

Q And do you have personal knowledge of your own as to whether or not the main machine still is in existence?

A I am not sure what you mean by personal knowledge. This is a technical matter, and I am not quite sure what you mean by that. I have personally sought the machine and parts all over the physics department and subterranean and other areas connected therewith, and I have found nothing of this character except we have found one drum that we know where

it is, one of the drums, and I don't know whether it was a CA or a KA. They were the same, I can't tell which it was, one drum, and a box containing some of the brushes that we used on this machine which turned up in the last three or four months at Iowa State University since somebody's disk, which has been recovered, without any doubt came from that era.

Q Other than --

A It also contained -- it certainly came from my personal possession because it contained a film of, a roll of exposed film of my children but unprinted, which has since been printed and verified, so without any doubt it was a box of material which came from my own possessions.

Q Other than those objects you have just described, have you found any other parts or portions of the main machine as we have called it?

A I have not.

Q Now, after you went to work for the Naval Ordnance Laboratories, and from that point forward, could you give us a brief description of the balance of your career?

A To date?

Q To date.

A Well, in September 1942, I went to work for the Naval Ordnance Laboratory. I was soon in charge -- I went to work on acoustic mines. I was soon in charge of

evaluation of the characteristics of all naval acoustic mines. I directed work to those ends and designed and built test apparatus for this purpose and evaluated the mines for the purposes of warfare and then as the war drew to a close -- oh, yes -- I should say, I should enumerate one other item in my personal history. There was one acoustic mine in the very low frequency region which is so low that it's not even called an acoustic mine, it's called a pressure mine. The pressure waves have a period of a minute or two and this is called a pressure mine and this mine had been developed at the Naval Ordnance Laboratory but it had been withheld from combat because of an agreement between Roosevelt and Churchill.

Then just towards the end of the war the Germans themselves developed this mine and commenced dropping it something like, somewhat before, I believe, D-day and in about 24 hours we had one of these mines in our laboratory. One of them didn't explode for some reason or another, and they pulled it out and brought fluid over and we had it in our laboratory, and low, it was the very animal that we had ourselves worked on and withheld from service. It was withheld from service on the principle that it would have been extremely injurious to the commerce into England if it had been in existence.

Now, we were faced with the opposite

thing, and although our purpose was not to build -- was to build mines and not to build countermeasures, it was soon clear we were the ones that had knowhow about this mine, and the Bureau of Ships whose cognizance it was to build countermeasures didn't have too much background at first, and so we went to work on countermeasures, and I designed a countermeasure for this mine which I will describe no further. Partly because of this act and for other reasons, as the war drew to a close, I was given one of the first distinguished, of the Navy's newly-created Distinguished Service Awards, the highest award given to civilians, and this was more of an event on that day than it would be today.

We then commenced plans to move the laboratory to White Oak. The laboratory had up to this time been in very poor quarters in the gun factory, and I was then made head of the acoustics division of the Naval Ordnance Laboratory and my cognizance and responsibility changed some and I commenced gathering a group of people together and after they had a few wooden buildings put together at White Oak, they commenced pressuring me to move some of my men out to White Oak, and I can imagine, White Oak is 20 miles, perhaps, from the gun factory, and I can imagine myself spending most of the time going back and forth from White Oak, and so I went out and visited the situation out to White Oak, and I told them if they would give me the whole thing I would move my

whole division out there and I did so. Nobody else wanted to move, and I just moved everything of mine out there. So it satisfied the other people and satisfied me.

Well, of course, at this time there was getting to be an intensified interesting computing machines, and for a time there was the decision that the Navy would build a computing machine, and the agency who would build the computing machine would be the Naval Ordnance Laboratory, and I commenced new work on computing machines. I say anew, because it's clear that the new technology and new means were different in scope than the ones that we had previously used, and although many problems were exactly the same, well --

Q Approximately when was that?

A Oh, goodness, it was during the year '46 if my memory is correct. The whole enterprise took place, I believe, in the year of '46. I haven't refreshed my memory, if I had my book here I could read it out of there but I will just guess '46.

W-8-1

Q How long a period of time did that activity continue?

A Well, in the first place we had no means, no means were provided and I had to commence recruiting men and I recruited three or four men and started them behaving according to Civil Service system of running up job descriptions, hiring additional men and getting those approved, why, then, it would mean six or eight months later the Navy was commencing to decide that they didn't want to build a computing machine after all. It was kind of an abortive effort but I record it for the sake of accuracy here. We did -- we were looking -- we had -- we were looking into the subject of cathode-ray memory at that time, also magnetic drum memory. There was no magnetic core memory, that hadn't been devised.

Then the new building was, the large building was built in the Naval Ordnance Laboratory there at White Oak and I and my staff and the group in the acoustics division occupied the space in that building, and we had, we constructed there a very large an-echoic room for the making, measurements on acoustics and air, and then we continued doing those things which were necessary to the normal function, to those normal functions of the Naval Ordnance Laboratory , which included mines, but other things, torpedoes, countermeasures of all kinds against them, detection devices against ships, men and weapons and the like.

Then, oh, goodness, I suppose in 1949 I took a position as scientific advisor for the Chief Army Field Forces and spent, I guess, eighteen months as Chief Scientific Advisor to the Field Forces of the United States Army, and at that time I returned to the Naval Ordnance Laboratory as Assistant Director with full charge of the Navy's mine program. I guess this was in '50, perhaps, and I was in charge of that until early in '52, at which time I resigned from Naval Ordnance Laboratory, formed a corporation and went into research and development work on my own. I had -- I was the principal stockholder, but I had associates.

Q What kind of research and development work?

A Well, you know when you start a thing like that you do what you can get, and what I could get readily because of my strong background, of course, was research and development with regard to fuses, and the first contract we had was in vacuum tube fuses, V.T. fuses, proximity fuses for the Armed Services of the United States, and later we took on a great variety of other jobs; and I maintained this group in operation until late in '56, at which time I was approached by two prospective purchasers of my division. It got to be fashionable to go into Washington and pick up small companies and add them on as a satellite onto your organization. So I had two purchasers at one time, which was a favorable state of affairs, and as it turned out, well, one of them was

Taylor Instrument Company and the other one was Arrow Jet General Corporation of California, and we sold out Arrow Jet General of California, and somewhat subsequently I became vice-president of Arrow Jet General of California, and resigned, I believe, in '51 -- I am sorry, in '61 or '62, I resigned and retired in '61 or '62, intending to do only a casual job of consulting after that time, and this is a state of affairs that I have been able to follow mainly since that day.

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WS#8/2

Q Between your exposure, if I may call it that, to this Navy project of a computer that you said was aborted and the end of your period of time with Aero Jet General as an officer or employee thereof, what other exposure did you have to working in the field of computers?

A I had no -- well, you know, no other exposure except as a scientist normally would. I myself, I am sorry to say, at this moment do not know how to program a machine upon a large computer, and some of my friends say it will take me seven months to learn and some say two. I haven't done it. I ought to do it, but I don't know, I have had some contact as a scientist to date, of course, must have some contact with the computing art, but no other art -- no other contact than that I -- that is as far as the art. You were asking about the art itself?

Q And working in respect thereto.

A Yes. Well, we used computing machines but only -- we never had access, I believe my company during its existence, now that outfit is using computing machines pretty extensively, but I believe we never had a project upon computing machines, literally, during that period.

Q While you were associated with the military did you have anything that required you to have a top secret clearance, anything of that sort?

A I did.

Q What required you to have that?

A Well, I was associated with a project called Crossroads and later with the other atomic projects, and so it was necessary for me to have Q clearance.

Q What was the nature of your connection with operation Crossroads?

A Well, you know, part of it was acoustics. Beyond that I believe I should not say, in view of the possible remaining classification. I don't think it amounts to much, but I believe, unless you insist, why I will go no further.

Q What was operation Crossroads?

A Operation Crossroads was the first postwar atomic operation held in Bikini Atoll. When, I don't know. I will figure it out if you insist.

Q Were you there?

A I was there.

Q What did you do?

A Well --

Q Within the limits of your ideas of security, anyway.

A Yes. Well, I worked like hell every day, long hours, aboard ship and aboard shore, largely in the island of Enyu , and didn't wear many clothes and one day --

Q What were you doing?

A Doing electronic work.

Q Of what character?

A Well, acoustic in character.

Q Was it measuring, detecting or can you give us a word that would describe the character of it?

A It was measuring and detecting and I will put a period there. I don't wish to go further.

Q Did you have any similar activities while associated with the military?

A Oh, yes, I had another operation called, well, project Helgoland. You can call it Project Helgoland. The military came up -- they had seized the German island of Helgoland off the north coast of Germany there, off Wesermunde and they decided to destroy it once and for all. They had done it once, they had destroyed it once after World War One but they decided to destroy it for good this time and it had been used as a storage depot for conventional munitions, and they decided -- and by they, I mean, I guess, principally the British decided to explode all those conventional munitions that remained there without being moved for many, for a considerable period of time, and it was believed that it would be dangerous to attempt to move them and destroy them otherwise, so they decided to wire them all together with something called shock cord. Shock cord is a piece of material which is a cord but it contains, it conducts high explosive. It contains material which is in the high explosive category and it conducts shock waves down each section, and they wired

them all together with a shock cord and were going to set them off and destroy the island forevermore.

And somebody in the division of the Navy called ONR, decided this was the largest man-made explosion which ever had been undertaken, and that we should now use that to get some idea as to how you could measure the pressure, the seismic waves from high explosives. Up to this time, seismic waves had always been associated with nature made events.

Well, they went all over the scientific world and asked for help, but there was only some two or three months remaining before the explosion was to take place, and as a last resort they came to Naval Ordnance Laboratory and approached me and asked me if I would instrument for these tests, and I don't know, I thought I shouldn't, but I knew someone should, and I knew it was a good chance of losing my shirt in an indirect way because the instrument manning at that time for the detection of seismic waves at arbitrarily selected sites without special long-time instrumentation didn't look like too good a proposition, and Dr. Merle Tuve of the Department of Terrestrial Magnetism of Carnegie Institution in Washington had strongly advised me against having anything to do with it, but I did it anyhow. I told them all right, if they would get me the highest priority that the Navy had and supply me with the money and means I would do it, and I

believe six weeks later I took, I drew my material almost entirely from the stockpile of raw material, stocks of vacuum tubes and stocks of brass, and six weeks later I shipped to Germany by way of American Airlines, I will have to count, I guess something like 20 seismographs which I constructed -- it happened that in my files I had some plans. I had once planned to build a seismograph and I had these plans in my files and I drew them out and they looked pretty good to me and I built according to the plans that I had touched on before, and we shipped to Germany something like 20 seismographs.

Now, in addition to that, I decided that simultaneously we should measure the air pressure so I also built a microbarograph and attached them to the expedition, and we also had to train observers, and you have a lot of training of observers because you have to do a lot of training, you know, in accurate timing of these. You have to set up a system of time signals so that you get accurate timing of the events at all stations, and we set this chain of stations up across Europe from, oh, east -- west of Hamburg on the north clear down to Goritzia in North Italy, and each station received signals in useful form except one in which there was an interruption due to the Army supply Jeep driver breaking his leg and it was considered, and I considered it kind of a good series of events.

Q While in the service associated with the military in connection with the acoustic or other work, were you exposed at all to electronics work and circuitry and things of that sort?

A Yes. Of course, that is the substance thereof, I would say, you know. Acoustic work today is almost, well, 75 or 90 percent electronics.

Q What was the proportion while you were actively in that area with the Naval Ordnance Group?

A Perhaps in such proportions as these. I can't add anything. You know, these things can't be exactly measured.

Q Then, Dr. Atanasoff, I am going to go back in time again and ask you if you can recall when you first met John W. Mauchly?

A Will you read the question?

(The question was read)

THE WITNESS: I can.

BY MR. HALLADAY:

Q When was that?

A That was between Christmas and New Year's in the year 1940 at a meeting of the triple A,S, American Association for the Advancement of Science, probably in the physics section meeting at Philadelphia, and the exact day, it's oh, the 27th or plus or minus a day or two, I don't know.

Q Before that event, do you recall what you had been doing immediately prior?

A Well, it happened that I was in Philadelphia because I was, I had some business in the East, and, of course, one of the things that I had planned to do while in the East was to visit these meetings of the triple A,S, an event which I considered important from a scientific point of view.

Q Where had you been before going to Philadelphia?

A Well, I had started with my -- a very rare event in my life, I started with the family from, including three children, from Ames, Iowa. I had driven to New York State where I had relatives, then into New York City and then into Philadelphia.

Q And the family that was with you consisted of what persons by name, please?

A My wife Laura, and three children, Elsie, Joan and Johnny, John, Jr.

Q Is Joan one word or two words?

A It changed somewhat with time. I believe it's still one word and originally it was spelled J-o-a-n, and I think it's now spelled J-o-a-n-n-e, but I am not sure.

Q Do you have a memory of staying overnight in Philadelphia?

A Yes.

Q On that occasion?

A Yes, I did.

Q Do you have a recollection of where you stayed?

A I do not.

Q Will you describe for the Court your best memory of your meeting with John W. Mauchly on that occasion?

E-9-1

A Well, you know what you do when you go to scientific meetings, you take out the list of papers which are going to be presented and you look over them and you decide which ones have some interest and, of course, it's perfectly obvious that you have to be selective because you can't possibly see and hear all the people who speak, and so it came that on this late afternoon I was sitting in the back of a -- I don't know whether they call it a lecture hall or a classroom, and the exact location of that lecture hall or classroom I do not know at the moment -- listening to a man by the name of John W. Mauchly discourse on some statistical problems that he was, that he had been working on and also discussing a harmonic analyzer which he had constructed.

Q Do you recall the site of this discussion, s-i-t-e?

A Will you spell it again?

Q S-i-t-e?

A The site of this discussion?

Q Yes.

A Oh, yes, very well. I have imagery of very exactly what happened after the meeting, quite clear imagery. I don't know, some things come back to persons and some things don't, but I remember I approached the podium and --

Q Well, that's not what I meant to ask, so by spelling the word, I somehow misled you.

A All right.

Q I am trying to find out if you can locate where in Philadelphia or in its environs, where this took place.

A I am sorry. I cannot. I thought I previously said not, and I therefore believed that you wanted something else.

Q No. I had understood you to say you couldn't say whether it was a lecture hall or a classroom.

A Yes. I said I cannot -- I believe the record will show I said that I cannot remember the place where this took place.

Q All right.

A I believe I said that. I hope I did, at any rate.

Q If you did I didn't understand it. Then will you tell us your recollection of what transpired?

A Well, I approached the podium, and I said, I gave him my name, and we commenced a discussion. They had been, as is usual in the case after a lecture, why two or three people remained, but there weren't many and in a moment I was talking to him and we were all alone. And we walked towards the back of the classroom, and the conventional benches of that site are clear to me today. I remember one particular thing that there was a bunch of junk piled toward the back of the classroom as sometimes classrooms in American universities get pretty, in pretty bad shape, and of course they are subjected to a continual shower of chalk dust, and the room was

was extremely dirty and dusty.

I remember standing at the back of the room with windows on one side and chairs of the room on the other, carrying on a conversation for perhaps a half hour with Dr. Mauchly.

Q Will you now do your very best to tell us that conversation?

A Well, words, the exact words do not present themselves to me. I have no memory of them. I know roughly what was said. We discussed his -- I was interested in his Fourier analyzer, and then I told him I was interested in computing machines, as a matter of fact, I was building one, and I suppose a good many other things were said but I have no memory of them. He seemed to be a very nice and likable person, and we seemed to strike up a very warm and cordial relation.

Q What, if anything, did you tell him about this machine that you were building?

A I told him, I told him -- I had a stock in trade of what I told people, and I told him how many vacuum tubes it contained, that it operated on vacuum tube principles. I told him it was a digital machine, although I didn't use that word because that word was not available at that time.

Q What word did you use?

A I said it was a computing machine which although

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electrical in character, worked like a standard calculator, like, we will say a Marchant or a Monroe. I used such words as that, and I also in those days, and I don't know whether I did with Mauchly, I might have said it is a computing machine, it is a proper computing machine as contrasted with an analog machine. Now, the word analog at that time I am almost sure I used in discussion because I had been, I, myself, independently commenced to use this word. It was current in my thinking and writing at the time, and I think I used that word analog but the word digital I did not have.

Q What do you recall, if anything, of what Dr. Mauchly said to you on that occasion?

A He said he was very interested in it.

Q What else?

A He told me about his job at Ursinus, I remember something was said about that, he was professor of physics there, I guess.

Q Did he at that time describe to you anything that he had done by way of work on a computing machine?

A The only work which could be contrasted in this category was his work on the analog Fourier analyzer.

Q Did he describe to you at that time any work done by him on any ring counters?

A He did not. To the best of my memory and belief I don't believe that any such description was given.

Q Did he then describe to you any work done by him involving electron or electronic or vacuum tubes?

A I have no such memory.

Q Did he describe to you at that time a device built by him that could be employed to simulate the activities of a railroad crossing signal or anything that sounds like that?

A Now, I am in this position: I know that in the course of those early days he described to me a circuit employing neon tubes. Now, I am not sure whether this disclosure was made at this meeting or at a subsequent meeting with him. So I cannot answer beyond this point.

Q Did Dr. Mauchly at that meeting in Philadelphia show you any papers that you can recall?

A Show me any papers?

Q Yes. Papers, documents, drawings, sketches, anything of that sort?

A No. If he showed me any papers it was something relevant to the paper which he had just given, but I don't even think he showed me anything at all.

Q In the course of the deposition of Dr. Mauchly, he identified for us Mauchly Deposition Exhibit A-3. I have here a Xerox copy of that or a part of that here with me which is the best I can do at this time.

A Yes.

Q And which I am placing before you. Now, recognizing

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that we are dealing with a Xerox and not with the original, of course, has some limitations to it. Will you direct your attention to a name and some initials?

A I have.

Q On that Exhibit A-3?

A I have.

Q Now, can you say whether -- can you say whose name that is?

A It's my name.

Q By whose hand was it put on?

A By my hand.

Q Do you have a memory of writing your name on anything in this course of the discussion?

A I do not, but I might just remark that the equasion above looks a little bit like an equasion relating to Fourier analysis, it just has a remote character of that kind.

Q Now, on Mauchly Deposition Exhibit A-3, the equasion above to which you refer, is that in your hand or not?

A I believe not.

Q And also on that exhibit there is something that resembles a square in the lower left-hand corner and some other markings of symbols which I can't interpret even if I were looking at them right side up, which I am not. Can you identify the authorship of those markings?

A You know, I can't be sure, but I suspect they are in

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my hand.

Q Does that recall to your mind any subject of discussion at that meeting in Philadelphia?

A I know what the meaning of that is, it's some kind of a layout of a determinant or of coefficients for a system of equasions.

Q Would you explain what you mean by that?

A Well, you know, when you are studying a system of equasions, the unknown variables really don't count, the only thing that counts is coefficients, and you see there are some A's and B's which were letters I was inclined at that time -- now, this identification in toto cannot be called secure, I can't swear that that is in my hand, it seems to be in my hand and it seems to be something that I might have done in the course of a very -- in a very sketchy way in the course of the discussion of systems, solution of systems of simultaneous equasions.

Q Do you recall anything of such a discussion at that meeting with Dr. Mauchly?

A Oh, I expect the fact that the computing machine was designed to solve systems of equasions would be one of the things that -- was one of the things I told him, but beyond that I have no memory.

Q Then on the reverse of Mauchly Deposition Exhibit A-3, at least as it appears in this book from which I am

obliged to work for the present time, there are some other markings and some writing, will you direct your attention to the writing, please, on that page, and it looks like it starts with a capital G, just so you will have reference to what I am asking you about?

A I believe that --

Q Can you identify that hand?

A I believe it is in my hand.

Q Can you interpret what that writing says?

A It says the name of, "Goetz," but there were German authors extant by the name of Goetz, but I have no particular one in mind that could be associated with this, and as a matter of fact, the whole lot of them seem to escape me at the moment. I don't know what it means.

Q Then also on that sheet of Mauchly Deposition Exhibit A-3 on the upper left is a sketch --

A That would --

Q -- with some circles in it.

A I can roughly -- I can roughly unravel what the meaning of that sketch is.

Q Before we get there, can you say whether or not that sketch was drawn by you?

A I do not believe it was.

Q Do you have a recollection of discussing with Dr. Mauchly anything to which that sketch pertained at the meeting

in Philadelphia?

A You see the records will show that awhile ago I told about the discussion either at this event or some other event of some utilization of neon lamps, and this looked surprisingly like a circuit employing neon lamps which would be unstable and would cause one light to light and then the other, or perhaps to stick in one position or the other, and this has some significance in the counting art.

Q Do you have a recollection beyond that?

A I have no recollection.

Q Of the discussion?

A Beyond that, no.

Q Now, there are other markings on this portion of Mauchly Deposition Exhibit A-3. Can you identify any of the other markings as of your authorship?

A I don't know, you know, I am not a good psychologist, but they have a test called a Rorshach, and this is likely to commence, get close to a Rorshach test. I don't know if the name has been said right, but I think I can not verbalize beyond this point with sufficient reliability to make it worth while.

Q I am not sure you understood my question. The question was simply whether you can identify the authorship of the other markings?

A I cannot.

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Q All right. And at this point it would be Rorshach in type to ask you to interpret them, is that what you were saying?

A Yes. You put out some kind of symbols and a man's mind commences working and builds up. I am pretty sure about the build-up with regard to that circuit, their being accurate and right to the point, and it convinces me as I look at it that as a matter of fact it was at this meeting he told me about his employment of the neon tubes, this convinces me of it, but in a fairly reliable way.

Q Do you now have a recollection of seeing Dr. Mauchly draw the circuit on Mauchly Deposition Exhibit A-3 in Philadelphia?

A Is this A-3?

Q Yes. It's part of it that you have before you.

A Well, I do not.

Q Do you have a recollection of writing the word "Goetz" on that document?

A I do not.

Q Do you have the recollection of writing your name on that document at that meeting in Philadelphia?

A No.

Q All right. And have you told us now everything you can remember about the meeting in Philadelphia between you and Dr. Mauchly?

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A I emphasize the dirt in the back of the room again because I know that he couldn't lay anything down and I couldn't lay anything down because the desk was so dirty. I know it seemed like I guess I stated, it seemed like a cordial meeting and a warm one, each hand. This concludes my memory of that meeting, I believe, as far as I can at present recall.

Q All right. In a letter which you wrote to Dr. Mauchly some time after this meeting in Philadelphia, you may recall a statement to the effect that you would explain to him the two dollars per digit business, I think that's approximately the language of a later letter, do you recall that approximate language?

A I do. I even recall it from the day. It's strange.

Q Well, do you recall that language employed in any way in your discussions with Dr. Mauchly while at Philadelphia?

A I do not.

Q Do you now know what the reference to the two dollar per digit business is or meant at that time?

A I believe I do.

Q Will you state that, please?

A This was some kind of an estimate that I made at cost of producing a computing machine of this character which seemed to me to be a very modest sum for the production of a computing machine.

Q How does that translate into two dollars per digit?

A Well, a bit is a base two digit, you see, and this meant two dollars a base two digit, not two dollars a base ten digit; meant two dollars a base two digit, and roughly that would mean, I will multiply that for you, about six dollars a base ten digit.

Q And in what way does two dollars per digit at that time relate to the computing machine that you were then working on?

A Well --

Q If it related at all?

A Well, it was related because you see I felt that I had happened on a way to build computing machines which was extremely reasonable and practical. You know there had been efforts previous to this time, I don't know how much you want me to expand, but in which grandiose computing machines had been conceived, as far as I aware, of a mechanical nature, principally of a mechanical nature, at any rate, and these went -- nobody was willing to pay for them because they just weren't considering the speed and the cost. They were out of proportion to the then need of mankind.

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Q Well, what -- excuse me?

A And, of course, when you come to two dollars a bit, it looked pretty cheap to me.

Q What relationship, if any, does two dollars per digit have to the main machine such as is reflected by Atanasoff Deposition Exhibit V?

A You see that machine there, that's -- let's count the bits in one of those memories there, we have, say, roughly 1500 bits per cylinder and that machine would take two sets of drums comprising a total of 1500 bits each and to operate with them, and that meant that at two dollars a bit, which you base it on, that would mean you could construct such a computing machine for $3,000, and that, I don't know if this calculation is just exactly how it worked out, but it seems -- it seemed roughly correct to me at that time. Now, obviously it hasn't got much relevance to the present cost of duplicating entities.

Q After the meeting in Philadelphia, did you come directly back to Ames?

A No. I did not.

Q What did you do in the meanwhile?

A Well, I drove down to Washington and spent about a week in Washington.

Q Doing what?

A Well, I visited some friends. I -- but most of my

time was taken up with a search in the Patent Office for the state of the art relative to computing machines.

Q In that activity were you alone or accompanied by somebody?

A Well, at that stage of the activity, Clifford Berry took a bus from Ames into Washington and arrived and joined me in this activity. He stayed at the same motel that my family and I were staying at, and he and I spent all of every day and some evenings in the office or nearby working on the records and the patents that we could buy and the records of the office.

Q Then after that did you go back to Ames?

A We did then return to Ames.

Q Now, we have already made reference to the correspondence that ensued between you and Dr. Mauchly, and I won't go over that.

A All right.

Q Do you have a memory of the next personal meeting with Dr. Mauchly?

A I do.

Q What is your memory as to when that occurred?

A I believe that was on Friday the 13th in June of 1941. The date is subject to a little hazard but not much. I had received a letter from Mauchly telling me that he was -- that he was coming into Iowa on Friday and that he was, I believe he was coming, at any rate, he was attending meetings at the

University of Iowa, and that he would be -- that he would conclude those meetings on Friday, and I wasn't quite sure whether he would come Friday or Saturday. I -- my memory is that he came late in the evening and Iowa is, perhaps even in those days, two or two and a half hour drive. So I remember distinctly it was approaching dusk as he arrived, and I am almost certain from memory, and from the memory of events, it was on Friday that he arrived.

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Q Do you have a memory of seeing his arrival?

A Oh, I remember suddenly becoming aware that a car had driven into my drive and I believe I was working around a little ways away from the drive, and as soon as I became aware of it, expecting his arrival, I moved towards the drive and the house, and there was his car and there was John Mauchly coming around the corner of the car accompanied by his son.

Q Will you tell us what happened then?

A Well, we greeted each other as is conventional in such cases, and he, I remember that he said he brought his son along because he was giving his wife a vacation, something to that effect, and I don't know how many children he had then, I have no memory of that. The boy was perhaps six or seven and he was taken in tow by my children for his entire stay. My children, my youngest was, the youngest was six and Elsie was, well, 13, perhaps, and Joan was in between somewheres. Then it was getting near dinnertime and I guess we had some expectations he would arrive, and dinner was served, and, of course, we sat around and commenced to talk about a variety of things, about his trip at first and then how he liked the meetings at Iowa City, but almost at once about computing machines.

Q How long did Dr. Mauchly stay in Ames on that occasion?

A I believe until the following Thursday.

Q Is your memory such that you can separate the events and the discussions of that Friday evening from those of the following days so as to say what happened day by day?

A I believe that the state of my memory is such that I remember that we did some thing -- I remember certain events, but placing them accurately day by day is going to be hazardous at this date from the state of my memory, and I have some memories which relate to the timing of events which I can get, but there are other cases in which I cannot tell whether a given event occurred on one day or another.

Q Then would you do this, please. Tell us what transpired in connection with the computing machine, leaving out personal things of eating or whatever, as best you can, telling it day by day as best you can, and when you can't, tell it without reference to the days, give us a running history, then, of what transpired, to the best extent that you can.

A On Friday evening we did not go to the physics laboratory and visit the computing machine, but sometime over the week-end we did so. We had discussed the computing machine in some detail at my home before this visit. The machine was in the basement of the physics building, the place where it was constructed and where it had always been located. I took Dr. Mauchly over by myself in my car and there was nobody around and the machine was covered with a dust cover and I removed the dust cover and we stood and looked at it

and discussed the computing machine.

Now, I made no attempt at this time to operate the computing machine or even turn it on, and I don't know whether you know about the state of things around a university, but when a man has an able assistant, why he generally leaves turning things on and off in the assistant's hands because the assistant is less likely to damage something or blow a fuse. I wouldn't have thought of turning the computing machine on. I remember that. I said, "Here it is," and we talked about this part which we could lay our hands on, the various parts of it, and talked about it. And -- now, I have another event, another event that took place perhaps on Sunday or perhaps a subsequent evening. He and his son and my family and I went over with him to visit the computing machine. This is another occasion in which the computing machine was discussed but on which no operation was conducted.

This could have been either, again, even over the week-end because we had Saturday and Sunday to carry on discussions and we carried on full discussions about the computing machine during that period.

Then come Monday morning, I remember that when I had gotten this letter which you have, which I have in my file here, saying he is going to be here over the week-end, Friday or Saturday or something of the kind, I said,

"Clifford, how is the machine?" And, of course, Clifford had some shaft or something out of the machine, and he told me about it. I said, "Would you put that back into operation?" and I remember that distinctly, and Clifford said, "Of course," and so the machine, when Mauchly and I first looked at it, it was intact and substantially of a degree of completeness that I suppose I will outline before I get through here.

Now, come Monday morning, however, why, here we are over there and Clifford Berry is present and we are all looking at the computing machine and the machine was then operated and demonstrated for Mauchly and it was operated and demonstrated on several other occasions.

Now, my memory of what happened during this period encompasses similar events besides the computing machine, but relatively few. I would say that a principal part, probably two-thirds or three-quarters of our waking hours when Dr. Mauchly and I were in company, and this comprised most of the hours of the day during his visit, we were discussing computing machines, either this exact computing machine or the theory of computing machines or the future of computing machines. All of these subjects came in for a turn at that time.

Now, he during his stay, on one day he was a visiting fireman and I had to do him the due courtesy of a visiting fireman and I said, "Well, why don't you give us

your lecture on the subject of your dissertation last December in Philadelphia or anything else?" and he said he would do it on that same subject, and so I went around trying to get an audience together, and I had certain influences, some, certain proper and certain improper influences around the physics department. I was able to get an audience together of perhaps 15 bodies, and I remember getting up in one of the lecture rooms there and introducing Dr. Mauchly for the purpose of his giving a discussion on the computing machine, on his problems and statistics, not on the computing machine, on his problems and statistics and on the harmonic analyzer. I want to get this right because I once slipped on that. And some of the audience, I was professor of theoretical physics at Iowa State University at the time, and, of course, it would be likely to be some of my students who would have an interest in this, and I remember there was a short discussion afterwards, but a rather brief one.

Now, I believe that we made a trip to the statistics department at Iowa State University and then we also ate three meals a day. Sometimes I had something to do, but this was in the summertime and to the best of my knowledge and belief, I had no classes at this time. I am practically certain this is true, and so I wasn't called away, but sometimes something would call me away and I would leave Mauchly in my office perusing some of the material, or I

would leave him with Clifford Berry. He seemed to get along extremely well with Clifford Berry and they were soon on good workable terms. He was given an opportunity to read the, what I call the manuscript or booklet, and I can make that reference clear from the material which is at hand, if you wish. It is a booklet which is in green covers and of which I have two copies dating before that day in my possession here today, and he was given a chance to read this. He did so. He asked permission to take one home and he did take a copy to my house and peruse it in the evening. We discussed it in the evening. We discussed it during the day. We discussed it, as far as I could see, in detail. I know of no part of it that was not covered in discussion at this time. He was at any rate given full access to it. There weren't any pages tied or pasted or anything else when he had the booklet in his hands. I remember his relation to a few parts of the machine.

For instance, if you will observe on Exhibit 1419 there, you will see part of the machine called -- well, it is in this drawing, too. It's called --

Q Exhibit --

A It's Exhibit 5.

Q V, excuse me.

A Exhibit V?

Q V for victory.

A All right, Exhibit V, not 5. All right. I call to your attention the thing called IBM card reader which is situated there and refers to this device here. I remember during the period previous to his visit that we had been working on four things. In the first place, we had been working on a cure box for connecting a synchronous motor to the high speed shaft. That was being done during that period. These two devices here were being worked on during that period and this device was being worked on during that period. I can also state that roughly at that period that covers for the drum behind were being produced, but that makes little difference. Now, this device right here --

Q Excuse me, Dr. Atanasoff.

A This device was called IBM card reader --

Q I know this is a problem and I hate to interrupt you but in your answer given just before the interruption, you said "this device here and this device here" and you pointed to two parts of the machine on Exhibit V.

A All right. I will read those devices out. "This device here", the first meant base two in device as recorded in Exhibit V. The next "This device" referred to base two out as recorded in Exhibit V.

Now, the third device is the one which I believe I did spell out, namely, the IBM card reader was not finished but was partly constructed as of that time, and

I can remember Dr. Mauchly -- I don't quite know, I suppose somebody was working on it and they had it in our shop which is adjacent to the, which was on the floor with the computing machine there and I remember us going into that shop and Dr. Mauchly standing with part of that device there in his hand, the matrix, the bottom part of it, holding it in his hand, and our discussing the details of that device.

Q Is there any of the photographs that gives us a pictorial representation of that matrix?

A Not very clearly. Perhaps the best one, I can run through them and try to find one. There is one that hints at it, but hardly more. Well, there are two that hint at it. I will lay this one out. All right, now let's look at two photographs, 1411 and 1414.

Now, 1411 shows Mr. Clifford Berry with the IBM card reader open and there is an IBM card in there right in front of his left hand which is resting upon this element which I called the matrix and which will be read by the brushes which are in the hinged part relating to his right hand, being held up by his right hand. Do you see those diagonal little strips there? They are all brushes and those brushes are going to read through the IBM card into the matrix. They are going to contact the matrix through the holes in the IBM cards, such holes as there are.

Now, I could call your attention to

another photograph, 1419, in which edges of the matrix are shown and which the guides control the position of the IBM card resting upon the matrix. One of them is clear and one end of another one is shown there underneath the black object which carries the brushes.

And then I call your attention to 1414 in which at the left-hand side you notice some wiring which is enmeshed in a peculiar way and this wiring is enmeshed because those wires are descending in this photograph, really ascending in the normal position of the device to contact the elements of the matrix, the contacts in the matrix.

Q Now, with reference to what you observed Dr. Mauchly observing, does any of these photographs to which you have made reference give a pictorial view of what was before his eyes?

A It is unfortunate that we did not take a picture at the time of Dr. Mauchly's visit showing the exact state, but my memory is quite clear on the status of the device, and I will attempt to express this status if that's your desire, if that's what you are asking me.

Q If you would, please.

A If that's what you are asking me.

Q I am particularly now referring to the matrix that you were just discussing.

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A The matrix, oh, you are referring to the matrix?

Q Yes, only that at this time.

A I have covered the photographs as they describe the matrix, as far as I am aware.

Q Well, the question was whether or not any of the photographs give a pictorial representation of what was before Dr. Mauchly's eyes or whether they don't?

A Not a very good one, no, I wouldn't say so.

Q When Dr. Mauchly looked at the part of the matrix that he looked at, was it separate from or attached to the main machine?

A It was separate from the main machine and it was separate from the rest of the IBM card reader. It was separate.

Q Now, you have said earlier that Dr. Mauchly had access to the manuscript, so-called, and you spoke of it as a green book?

A Yes, sir.

Q You said you had it with you?

A I do.

Q Would you produce it, please?

A This is not a production of the exact book which Dr. Mauchly had because I have no knowledge of the exact book. It is a book which was written, which had already been written at that time, and I have two of them here and they go under

the numbers 455 and 456, 0455, 0456, and it was either one of these booklets or one, as far as I am aware, of exactly the same typing and one or the other of these two booklets which he had in his hand at that time.

Q Did the booklet which he had in his hand during that time have photographs in it?

A It did.

Q Were they the same or different photographs that are in either 455 or 456?

A The same photographs, the same set of photographs and they were the same photographs, and those photographs are also enlarged in this set here.

Q Do you recall when you first handed or saw to it that Dr. Mauchly had access to this manuscript as now marked 455 or 456?

A I remember three or four occasions on which we were standing around discussing the manuscript. This was -- I have no further memory. It was not at the last instance of his stay but rather early in his stay because I remember the discussion which took place relative to the manuscript. That is my only memory about it.

Q Do you have any memory of discussing the manuscript while at your home?

A I do.

Q What is that memory?

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A Well, we were in my study and he had the manuscript in his hands and we were going over some part of it, but the part I do not know.

Q Do you recall when that was?

A I cannot tell you when that was. That was in an evening. It wasn't during the day. It was in the evening when we normally would be at home, but which evening it was, I do not know.

E-11-1

Q Do you have any recollection while in your home of ever drawing anything, sketching anything or seeing him do so?

MR. DODDS: Objected to, that is leading.

THE WITNESS: I think that -- well, I am positive that we did draw things, but I have no exact memory of any occasion on which we drew.

BY MR. HALLADAY:

Q Whether it was at home or somewhere else?

A Somewheres else, no.

Q What is your recollection of drawing, without regard to where it may have occurred?

A What is my recollection of drawing?

Q Yes.

A I said I had no exact recollection of a drawing, of an occasion on which I drew for Dr. Mauchly.

Q Do you remember doing any drawing at all?

A I don't remember any drawing at all. I have a rational reason for believing we drew because we never stayed together for many minutes, scientists never stay together for many minutes without drawing, but beyond that I have no other reasons for believing in drawing on that occasion.

Q All right. Do you have any recollection of Dr. Mauchly being introduced to Clifford Berry?

A I do not remember the occasion exactly in any way. I am sure he was introduced to Clifford Berry, but this certainty

is from other events and not from an exact visual memory of Clifford Berry and Mauchly standing before me and me performing the introductions, that I do not have.

Q Do you remember any occasion on which you left Dr. Mauchly with Mr. Berry?

A Yes. I remember occasions of this type.

Q Can you describe them?

A Not in any further detail. The exact occasion for meeting him is not in my memory in spite of the fact, as I previously recited, I had very few active duties, I had some -- I was a member of the graduate committees at Iowa State College, then college, not university, and as a consequence I know there were graduate students around there in furtherance of whose work I had to take some steps, and on these occasions I felt it perfectly free to go off and leave him in my office or leave him with Clifford Berry and he was left in both places.

Q Do you have a recollection now of persons other than Clifford Berry and your family who met Dr. Mauchly on the occasion of his visit to Ames?

A I remember Mr. Sam Legvold meeting Dr. Mauchly. I have a memory of Mr. Sam Legvold going to lunch. Lunch was generally eaten at the Memorial Union there at the, what was then and still is the Memorial Union, and we would go over and eat lunch together, and I remember an occasion when, it was

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mostly Dr. Mauchly and I alone, but sometimes Clifford Berry and Mr. Legvold would join us.

Q Do you recall any others who met Mr. Mauchly, Dr. Mauchly --

A I have --

Q -- during that visit?

A I have no certain memory of any others.

Q Do you recall the names of any persons who attended this gathering at which Dr. Mauchly gave a talk?

A I could make some -- no firm recall.

MR. HALLADAY: It's 20 minutes of 3:00, would this be a convenient time for our recess?

MR. DODDS: All right.

(Recess taken.)

E-11-2

BY MR. HALLADAY:

Q Dr. Atanasoff, directing your attention to Exhibit V which we have before us on the easel, can you tell us the extent to which that drawing represents the condition of the machine while Dr. Mauchly was there and the extent to which it does not?

A I believe I can.

Q Will you do so, please? And when I say Dr. Mauchly was there, of course, I am picking up there at Ames, Iowa?

A Right. At the time Dr. John Mauchly visited --

Q By the way, you are facing away from the reporter

now so please keep your voice up.

A Right. At the time Dr. John W. Mauchly visited Iowa State College and visited the computing machine project there, the machine had a general appearance not too different from this but there were certain differences. The motor drive, synchronous motor drive hadbeen completed two or three months before that time and was in place and operating. All of the add-subtract mechanisms had been completed, whether they were all in the machine or not I do not know. I can imagine that perhaps they were just partly in the machine. It didn't make that much difference, we could operate the machine with only part of the add-subtract mechanisms in place.

The array of tubes here called memory regenerating circuits had been completed long before and was installed in the machine and was operating.

The filament transformer was in position in the lower left-hand corner of the drawing as illustrated in Exhibit V.

The base two in and base two out devices were substantially complete and had been in the machine, I believe they were set in the machine to show their position while Dr. Mauchly was there, but they were available separately.

This base ten card reader was not in the machine, but as I described, Dr. Mauchly saw the matrix thereof.

The transformer banks for punching was not in place.

Of course, the shafts, high speed and low speed shaft were in position.

The temporary one-cycle switch was in position. That had not yet been replaced by another device.

The boost and carry drum was not in position. Its function was carried by a small model of itself, I mean which just related to, instead of relating to every position across the memory drum, just related to one position or two positions at a time.

The timing control and contacts were not in position. The drum which I call base ten to base two drum had been completed and was in position on the shaft, but you see its principal wiring would be to the matrix contained in the base ten card and that wiring was not in place at the time Dr. Mauchly was there.

Now, the power supply and regulator were in their last form at the time he was there.

I believe this covers the appurtenances which are immediately evident from review of the Exhibit V.

Q With respect to the legends on Exhibit V and the arrows pointing to the position of brushes, can you state what of such brushes were in positions reflected by the legends on Exhibit V as of the time of Dr. Mauchly's visit?

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A Well, the brush holders had been constructed, but I believe that they were only partially occupied by brushes at the time Dr. Mauchly was there, a few positions being occupied by brushes and the rest vacant. The brushes were put in there and held in place by a little set screw, and so you could easily leave the brushes out. A great deal of the wiring was in position. I pointed out some wiring that was not in position, that from the base ten to base two drum over to the matrix for the -- I mean the terminal board for the base ten, base -- I mean base card reader, IBM card reader, that wiring was not in position, but a great deal of the wiring across here was in position. I believe all this wiring was in position or was in its last phase of completion, and the wiring, and a great deal of the wiring to this, from this device down to that, down to the memory generating circuit was in position, from the Drum No. 2 to the regenerative positionwas in position, the wiring to timing and control contacts was not in position and neither was the drum finished or in position at the time he was there.

E-11-3

Q Again it's my problem with the record here that some of this repeats what you have just said.

A Sure.

Q Directing your attention to the words "brushes," to the left on Exhibit V, immediately above the drum that is captioned with the legend "base ten to base two"?

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A Right.

Q There is an arrow then from the word "brushes" down to a position in the drawing which I am attempting to indicate and which you now are pointing to which would be --

A There are two arrows for the word "brushes".

Q Excuse me, Dr. Atanasoff. Just let me finish this part to try to get it into the record, and I may be doing this in a very laborious way.

A That's all right. I am sorry.

Q I am just directing your attention to Exhibit V, the word "brushes" and the arrow leading from the word "brushes", that is furthest to the left on the drawing?

A All right.

Q And have you now looked at that arrow pointing to brushes in that general location?

A I have.

Q As of the time of Dr. Mauchly's visit were brushes situated in that position?

A They were not situated in the position of the left-hand arrow, no. There were no brushes at that position.

Q Moving from left to right then, the next arrow leading from that left legend, "brushes," with some --

A May I add a phrase to my explanation of the other?

Q If you wish?

A The other, the brush holder bearing upon the base 10

to base 2 conversion drum was not in place at the time of Dr. Mauchly's visit.

Q Neither the brush holder nor brushes nor wiring therefrom?

A Right.

Q Were in place at that time?

A Right.

Q For the base 10 to base 2 converter?

A Converter, yes.

Q And moving over to the position on Exhibit V where the arrow points near Drum No. 2, "KA," what are the facts as to the presence or absence of brush holders or brushes at this position on Exhibit V at the time of Dr. Mauchly's visit?

A The brush holders were completed at the time of Dr. Mauchly's visit. Certain positions of the brush holders had brushes in them. My memory is that it's three or four positions at the left-hand side.

Q Moving further then to the right to drum No. 1, "CA," where there again is an arrow from a right-hand legend or word, "brushes," the first of which points to, if I am reading it correctly, from where I am sitting, brushes in connection with the timing control contacts drum?

A There was no brush holder at that position at the time of Dr. Mauchly's visit. There is no wiring to brush holders and no brushes and the drum itself was not in position at the time

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of Dr. Mauchly's visit.

Q Then next to the right on Exhibit V is drum No. 1, "CA," and another arrow leading from the right-hand word or legend, "brushes," and as of the time of Dr. Mauchly's visit, describe the condition of that brush holder and those brushes?

A The brush holders were in position, certain of the positions were occupied by brushes, I think three or four of the positions at the left were occupied by brushes at the time of Dr. Mauchly's visit.

Q As of the time of Dr. Mauchly's visit, were there wires leading from brush positions or only from positions where brushes actually were installed?

A The entire wiring harness was in leading from Drum No. 1 to brush holders associated with drum No. 1 across to the top of the rack containing the add-subtract mechanisms. The wiring was in position running from Drum No. 2 down to what is recorded as memory regenerating circuits, but the other wiring there was not in position.

end take

f 12-1

Q Then further to the right with reference to the right-hand word or legend "brushes," is another arrow pointing to something that on Exhibit V is described as boost and carry drum. What are the facts as to the presence or absence of brushes at or about that point when Dr. Mauchly was there?

A Well, may I first recall that I stated that at the time of Dr. Mauchly's visit that brush and carry drum was not in position. Its function was being carried by a small device of the same character but a temporary one.

Now, that had a temporary brush holder associated with it, and those brushes were in position but the presently depicted brushes and brush holder were not in position.

Q What about wiring in connection with the brushes that were in position?

A It was just a temporary wiring.

Q To what?

A To -- you see, that wiring had to go from, let's say, boost and carry, it had to go to a brush upon drum 1 and a brush upon -- no, let's talk about boost first, separate boost and carry. Just consider boost. There had to be a wire running from the boost over to drum No. 1 and drum No. 2. There also had to be, we had to have a separate carried brush for each set of brushes for each place that could be utilized. At the

time of Mauchly's visit, we could only utilize two or three places in the left-hand side of the drum. Those wires run from the temporary brushes which were near the present position of the boost and carry and they went across to the add-subtract mechanisms.

Q And what, if any, connections were there between drum No. 2, KA, and the add-subtract mechanisms at the time Dr. Mauchly was there?

A The connections from drum No. 2 to the add-subtract mechanism went by way of the temporary one-cycle switch at the time Dr. Mauchly was there.

Q While Dr. Mauchly was there at Ames on this occasion that you have been describing for us, what, if anything, did you do in the way of tests or demonstrations in his presence?

A The tests and demonstrations were those, were exactly the ones that I stated that were done for Mr. Sam Caldwell. They consisted, first, of a test of the unit on the test set; second, of a test of the regenerative principles applied to the memory circuits of the machine; and third, tests of the computing power of the machine to add and subtract. These were the tests which Dr. Mauchly visited -- witnessed, and they are the same tests that I have previously described.

Q In the process of so doing, did you use or did you not use any test set?

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A We used the test set which had previously been devised and employed which provided the material, the physical material for the associated circuits to the add-subtract mechanism. It included a transformer for supplying the filament current, a power supply, including a transformer, rectifiers to produce a plus 120 volts and minus 120 volts which are utilized in the circuits in question, and also produced the input signals necessary to actuate the add-subtract mechanisms; and then also available were the additional, the deflection instruments necessary for describing the output of the test set -- not of the test set, of the add-subtract mechanism.

Q You said deflection instruments. By that you mean what?

A I mean moving needle instruments.

Q Or meters?

A Meters, right.

Q I have previously had the reporter mark as Atanasoff Deposition Exhibit W, an enlargement entitled "Fig. 1." Are you able to see that from where you are seated?

A I am.

Q Do you recognize that as being merely a simple enlargement of figure 1 from your manuscript, Exhibit 455?

A Yes, I do.

MR. DODDS: Objected to as leading.

THE WITNESS: This has been redrawn by following the contour, as far as I have been able to determine, by exact examination of the original drawing of Figure 1 which is contained in the manuscript, and it represents a photographic reproduction of this drawing.

BY MR. HALLADAY:

Q Would you take your manuscript, Exhibit 455, from your original files, so that you have it before you, please?

A I will. All right.

Q And tell us now whether or not Atanasoff Deposition Exhibit W is an enlarged duplicate of Figure 1 in Exhibit 455 or if there are some differences?

A I notice that one copy has had B-1, B-2 and B-3 written down in ink. I believe this ink, as far as I know, this ink is from those days, but the other copy has B-1, B-2 and B-3 in the original legends.

Q Is there some difference in the mechanical appearance of them but no difference in substance, or what is the difference you have been discussing? You see, I don't know what you are talking about.

A I am sorry. He is pointing out a difference in the way the letters are placed on the drawing. However, these letters are witnessed by lines at the points to which the letters witness are correct in each case as far as I can

determine.

Q Well, then, just for the record, can you determine by looking at Atanasoff Deposition Exhibit W, whether it is more nearly, whether it more nearly resembles Figure 1 in Exhibit 455 or Exhibit 456, and if it resembles 1 more than the other, tell us which one it resembles more nearly?

A It doesn't resemble either one very closely.

Q And in respect only to the identification of B-1, B-2 and B-3?

A Only to the placing of the letters B-1, B-2 and B-3, not to the points which they witness.

MR. FALLON: Mr. Halladay, let the record show that I entered into a colloquy with the witness because you asked something about or the words "photographic reproduction," was brought up, and in this respect, the reproduction is not photographic.

THE WITNESS: That is true.

WS
12/2

BY MR. HALLADAY:

Q Save for that, is Exhibit W an accurate reproduction of either Figure 1 in Exhibit 455 or 456?

A In a technical sense it is, as far as I am aware, an accurate rendition of either one.

Q Then what does Figure 1 show?

A Figure 1 shows in a schematic way the memory regenerative circuits and the connections during addition and subtraction between cylinders KA and CA. Also shows the add-subtract mechanism, the input and output terminals of the add-subtract mechanism, but the mechanism itself is depicted only in a block, by a block symbol. It also shows the boost -- I am sorry, the carry cylinder.

Q When you refer --

A It's marked boost but it's really the carry cylinder. It fooled me for a second.

Q When you said, referring to Exhibit W, or Figure 1, as the case may be, that it shows the add-subtract mechanism in the form of a box, is that the rectangle containing the letters A, D, E, C, G, F, B, reading clockwise, underneath which are the three letters ASM?

A It is.

MR. HALLADAY: Mr. Fallon, would you be good enough to lift that down just so that we can see the one behind it? I am sorry, I thought there was

one behind it.

MR. FALLON: Yes, there is.

MR. HALLADAY: The hand is quicker than the eye.

BY MR. HALLADAY:

Q I now have before us, Dr. Atanasoff, Atanasoff Deposition Exhibit X also labeled "Fig. 2." Can you identify that?

A This is a schematic drawing of the add-subtract mechanism as employed in the computing machine, the large computing machine which has been under discussion. It depicts each triode in a separate envelope, but you must remember that to this extent it isn't accurate, because, as a matter of fact, I believe it's triodes one and two, and so forth, that are in a common envelope. Except for this symbolic difference, the wiring diagram here is the wiring diagram of the add-subtract mechanism of that day.

Q Referring back to Atanasoff Deposition Exhibit W or Figure 1 of the manuscript, Exhibit 455, do you have any recollection of a discussion of that Figure 1 with Mr. Mauchly on the occasion of his visit to Ames?

A I do not.

Q I didn't hear your answer.

A I do not.

Q And referring to Atanasoff Deposition Exhibit X or

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Figure 2 from the manuscript, Exhibit 455, which we now have an enlarged version before us, do you have a memory of discussing that diagram?

A I do.

Q Do you recall when that discussion occurred?

A I do not recall.

Q Do you recall whether it occurred once or more than once?

A I am positive that it occurred more than once, but my memory only tells me once, of once.

Q Would you tell us what that discussion consisted of?

A It consisted of a discussion of the way that such computing circuits operated, the logical principles of devising computing circuits of this type.

Q Can you say now what words you used in that discussion?

A I certainly cannot.

Q Can you give us the text or context or gist of what you said?

A Well, I think that it is a noteworthy thing that you can make, it was as of that date a noteworthy thing that you could make a circuit compute in this way, and it is of that that we spoke.

Q Can you say what you said in substance?

A I remember -- I cannot.

Q Can you remember any part of the discussion?

A I remember one part of the discussion.

Q State that part.

A That part was as follows. I remember discussing this point, that it is a requisite of active elements for a computing circuit that they be done linear.

Q Anything more that you recall saying to Dr. Mauchly about the logic or the logic of the circuit?

A Not in specific form enough for the operation of memory to allow me to present it here.

Q Directing your attention back -- and I appreciate the scene shifting, Mr. Fallon -- to Atanasoff Deposition Exhibit W, is that a correct representation of the circuit involved in the regenerative memory portion of the main machine?

MR. DODDS: That is objected to as leading.

THE WITNESS: I am about to admit that the thing is not quite right, and I think you saw that, Mr. Dodds. There is a mistake in it.

BY MR. HALLADAY:

Q All right. What is the character of the mistake?

A Well, it is a draftman's error.

Q In what respect?

A It is in regard to the plate connections of the two depicted by the symbol T sub 1.

Q Now I am mounting a piece of relatively transparent plastic over the symbol for T-1 on Exhibit W, and just in case it's necessary to replace it at another time, I am going to put at this point registration marks where the corners of the plastic are away from the body of the drawing. Do you want to recap it? Can you mark on the superimposed piece of plastic what would be necessary to have Exhibit W correctly reflect the actual circuit?

A Yes.

Q Will you do so?

A Well, the lead running across from S-2 should move into this position, contacting the plate lead at the effective position there and not contacting the upper end of it.

MR. DODDS: Excuse me, Doctor. I think you said S2. Is that what you mean?

THE WITNESS: Say that again.

MR. DODDS: I think you said S2.

THE WITNESS: I am sorry. Thank you. From switch S3, the lead coming over from switch S sub 3 connects directly into the plate of T1, between the plate of T1 and the plate resistor shown in the original diagram. The plate resistor is in the correct position. The lead on the other side is correct. I will draw it as it is.

Now, we have to interrupt this circuit

here and I am going to show the interruptions by just little strikes across them cutting out those leads. It wasn't too handy the way I did it, but I did it well enough. Now, however, that tube is left without plate voltage and we must take a lead off and bring it up and call that plus 120 volts. Now, I believe that is -- all right, plus 110 volts, I should have said, but that will do well enough. Since I said minus 110 volts, we always kept the voltages roughly the same. They might have differed 10 volts, and I perhaps should have said plus 110 volts there, but it makes little difference. There is a little confusion in the legend here. Sometimes we used 110, sometimes 120, so the whole literature has kind of got this error sifted through it.

BY MR. HALLADAY:

Q And just for certainty, can we now tell by the positioning of the plastic overlay the condition of the original drawing, Exhibit -- or the reproduction of Atanasoff Deposition Exhibit W as it was, and then with the overlay in position as actually reflecting the circuit in question?

A Yes.

E-13-1

Q With reference to the circuit on Atanasoff Deposition Exhibit X, can you tell us whether or not that accurately reflects in a diagramatic fashion the add-subtract mechanism circuit that shows up inside of the box?

MR. DODDS: Objected to as leading.

MR. HALLADAY: On Exhibit W?

MR. DODDS: Objected to as leading.

THE WITNESS: I believe that that diagram Figure 2 exactly represents the connections and condition except for the proviso previously stated that the envelopes are here assigned to each triode instead of being assigned to triodes in pairs. Except with that one correction which is superficial and as far as the language of electronics goes, is a schematic error only, I believe that this exactly depicts the add-subtract mechanism.

BY MR. HALLADAY:

Q Then earlier in your testimony, Dr. Atanasoff, you had referred to the fact that the dual triodes that appear on Exhibit V in the add-subtract modules had grid caps, but of the seven, one did not have a grid lead. Is this reflected in any way on Exhibit X?

A It is.

Q Describe that?

A You will notice that here is the item which exactly

illustrates that. You see there is a grid lead there without any connections at all, a so-called free grid of the electronic world.

MR. FALLON: I think you ought to --

BY MR. HALLADAY:

Q Does that which you have so identified --

A It is --

Q Excuse me.

A I am sorry. This is a grid of what we call triode 9 in Figure 2 or Atanasoff X.

BY MR. HALLADAY:

Q All right. When you say this, you mean --

A The free connection, the unconnected grid is associated with the triode 9 in Figure 2. All right. Thank you. I am getting a little tired.

Q For the benefit of the Court, Dr. Atanasoff, can you explain how either with reference to these drawings or diagrams or without reference to them this main machine added or subtracted and how in the process would you describe how you could tell it was doing that, and you should have in mind if you would, please, that the Court may or may not be familiar with base two numbering systems. Now, recognize I may have given you by this, perhaps deceptively simple question something of a tall order?

A Well, let me --

Q But what I am asking you to do, if you can --

A Let's begin by --

Q -- explain how it operated to, for example, add, and how you could tell it was doing it?

A I will first give a one-minute discussion of the base two number system. The base two number system is a system of numbers which instead of having the digits 1 to 9 and then the zero which were invented by the Arabs, so many years ago, to indicate a circle and to indicate 10. We use the Arab zero but we only use one other digit, that is the digit one, so we are restricted to these two digits, zero and one. And we start to count in the following fashion: zero, which is nothing, one. Now, we are done with the digits and so we have to go to the device which is employed in the Arabic number system also of order. So we run, so we run -- so we shift the order and put this symbol down. This means one circle, one time around the number system and one time around this number system means two. It means, more precisely, I will give you a mathematical depiction of that. Then we have the digit, the number 11, just adding one to this and then these places are filled up and then we have to go to this number, this number representing what is called an Arabic notation, I mean in the base 10 number system 4, zero, 1, 2, 3, 4. After this comes, of course, 1 zero 1 meaning 5, 1 1 zero meaning 6, 1 1 1 meaning 7 and again we have run out

of positions in the first three digits and we have to advance to the fourth digit position and we have this number.

Now, if you want to, I can give you a mathematical description of the base 10 number system in these terms and the base 2 number system in these terms.

Q Excuse me, Dr. Atanasoff, just for completeness, you have gone through 8 in the decimal system with the corresponding binary system opposite on what you are drawing there?

A I have.

Q Would you mind putting 9 down?

A (The witness complies.)

Q Thank you. Now, I interrupted. Would you go forward with the statement of whatever you consider necessary to illustrate the question?

A At least for the record, I hate to go through this without any exhibit of erudition, so I will describe a number system in the following terms: A number system is an arrangement of this kind where --

Q You should speak up, please, sir, it's hard to hear you. I am sorry.

A Right. A number system is an arrangement of the following kind. Now if I can still do it, I will do it. It has things called digits and places in which we put symbols, and it has another situation which we call place, order of the symbol. Now a number system is depicted this way in which

any number N is depicted as a sum, and B is a number called the base and A is a coefficient which is multiplied into that base, and I should say a sub I is a coefficient of B raised to the ith power and in which a equals zero, one and so forth, but ending with a minus one. And you will find that in those terms any number system can be described and it describes this number system, of course, here base is ten and we have all the digits running up to 9 in evidence and zero also as -- that's true of any i, and also applies to this representation in regard to the base 2 numbers. That's the first step. That is a description of the number system.

Next we will do some operations with the base 2 numbers for illustration. I am sorry to impose this on everybody but -- suppose I put down a couple of arbitrary numbers. You see, you put them down by writing zero's and one's along here. Let me change that to a 1, may I do that, without bothering you? I have a reason for doing that.

EA 13/2/1

Q Now, you have written down what, just so that you say what you have written?

A I have written a couple numbers and I have to figure out what they are to satisfy counsel.

Q Just for the record --

A And I will have to figure out what they are because I do not know.

Q Dr. Atanasoff, bear with me. Just for the record what are the figures you have written down?

A 101011 and 110011.

Q One underneath the other?

A One underneath the other.

Q All right.

A Now I am going to do an addition. Of course, one and one isn't available in this number system so we put down a zero and carry a one in the upper position like that (indicating). Now we have to add three ones together and three ones together, three is of course written this way (indicating) but putting 1 there and carrying a 1 in that position, when you add this column you get a one, here you get a one, here you get a one and here you get a one zero.

Now, that is the way the base two number system works. I wanted a one there so as to illustrate as far as reasonably possible the method, the problems that you encounter in developing a logic circuit to do this job which

is done mentally by us here and which seems so elemental. Of course, you can devise a logic circuit for numbers to any base. They get to be pretty complicated if you don't work to base two and various devices are used to simplify the problem when bases other than two are used.

Q Dr. Atanasoff, you have said that as you wrote your 101011 on the board --

A Right.

Q And the 110011 on the board?

A Right.

Q That they were arbitrary numbers?

A That they are.

Q What did you mean by the term arbitrary?

A I mean that I haven't, except in this slight business of changing the zero to one in order to get an extra problem in the record, I haven't chosen them with any designs in mind and they are as if they were manufactured by a machine which is capable of uttering zeroes and ones at random.

Q Well, then, do you now know without thinking what the decimal equivalents are of 101011?

A Well --

Q Or 110011?

A No. I do not.

Q Can you --

A No. I do not know, and I will use these, the changing of these numbers to base ten digits to illustrate this principle depicted above in the theory.

Now, this means one 1, and this means one 2.

Q When you say this means, what do you mean?

A The right-hand digit.

Q Thank you. Now, I presume that this, well, it's hard, isn't it -- I don't know. The right-hand digit means one 1, the next digit, the second digit in the upper line means one 2, the zero there means, no 4, that 1 means one 8, this zero means, no 16, and that zero means one 32. So when we add those up, we get 43. That is the meaning of the upper number.

Now, the next number. This means one 1, the right-hand side in the second number, the right-hand side 1 means one 1; the second number means one 2; then we have no fours and no eights, fours and eights being powers of two, you see; but one 16 and one 32; so we add, adding them together, so we have those two numbers in Arabic notation in base ten number system written on the board. I hope my mathematics are accurate.

MR. FALLON: It is. Add up the last one.

THE WITNESS: Thank you.

BY MR. HALLADAY:

Q Then you --

A Then you must evaluate the meaning of the next symbol and it means --

Q Excuse me. Would you read the next symbol into the record?

A The next symbol is, read the sum, let me check the sum again. Yes, it seems to be all right. Yes. The next symbol reads one zero one one one one zero. That means one 2, one 4, one 8, one 16, no 32's and one 64, and that adds up to 80, 92, 93, is that right?

MR. FALLON: 94.

THE WITNESS: I guess it is 94 which is the sum of the other two.

Now, we can do a problem in subtraction the same way. I don't know, is it --

BY MR. HALLADAY:

Q I would rather stick just to the addition at this time if you please.

A All right.

Q Now, having given us this illustrative approach and some understanding of the two systems, how could you tell or how could the judge tell if you took him by the hand to your computing machine that it in fact was accomplishing addition of this sort?

A Well, you have on, let's say on CA you would have this number and that would have to be told by reading a cathode ray oscilloscope as far as the evidences which John Mauchly saw. This number would be on KA and then after the addition took place, this would be on KA and so on, I call it KA star -- I am sorry, I thought this -- I am sorry, corrections. This is CA, this is KA and this last number is CA star. I am sorry.

Q Meaning what?

A Meaning that that is a new number which appears on CA after the addition has taken place. Now, this number would have to be verified by a reading of a cathode ray oscilloscope attached to a brush bearing upon the CA cylinder.

Q What would be the appearance of the face of the oscilloscope tube while that was going on?

A It depends a little bit on the coding. Generally, you see, you got negative values for ones, so you would see here, roughly speaking, this number here would look like this (indicating), you have a depression there, then it would have a zero in the next position and then it would have a one in the next position, a one in the next position and a one in the next position, a one in the next position and a one in the next position, and then it would go up to zero and it would be like that.

Now, I guess I have, yes, all right. It might be exactly that way.

Q Could you put the legend CRT near that drawing you have made?

A I will, CRT, and it might be that the tube would draw -- I warn you that I might have drawn, I would conventionally hook a cathode-ray tube up so it would draw zero on the left instead of the right. Why we do that I don't know. We could draw it either way, but I am afraid that I would conventionally do it the other way. It doesn't make a bit of difference but you have to know how you connect it, and then you, having your coding in mind, then you can read the imprint from the cathode ray oscilloscope, and you can tell what the number, what number that represents, and that would be the method of verification that the computing done by this machine was correct.

Q Well, now, while Mr. Mauchly was there at Ames, did you actually go through anything that resembled this?

A We went through exactly this on the machine and on paper, doing it on paper and then doing it on a machine, verifying that the number, each number, each number that is being added on the machine was, as a matter of fact, the number that was on the machine and verifying that the sum was correct. We went through with such, with such illustrations of the operation of the machine.

W-14-1

Q In such an illustration, would you say that that was static or dynamic in character?

A I would say that this is dynamic, a dynamic illustration of the performance.

Q What does that mean?

A That means I am testing the machine, but I am also testing the add-subtract mechanism under conditions where it's actually running at a certain rate of speed and it is not merely a static device depicting the state as of one moment.

Q Did you do that on one occasionor more than one occasion with Dr. Mauchly when he was there in Ames?

A We did it on a number of occasions. There was at least two sessions in which the machine was operated and various sums and differences were displayed.

Q You say various what were displayed?

A Various sums and differences were displayed. We haven't talked about difference here, but I will --

Q When you use the term "difference," what was the machine doing?

A The machine is subtracting instead of adding.

Q While Dr. Mauchly was there at Ames, did you ever operate the machine so that it continued to run and continued to add?

A We did.

Q Can you describe that?

A Well, this is some of those tricks that the boys devised to display a machine in operation, and Clifford Berry had a way of counting the number of turns which a machine made, and then he could let the machine run for an extended period of time, counting the turns, and then verify that the sum of the adding a certain number of times into the machine was correct.

Q Can you recall just how that was done?

A How the counting was done?

Q Well, how -- what was this method Mr. Berry had derived or arranged for?

A You know, he had a revolution counter and he stuck the revolution counter in there, and at the same time closed the switch.

Q What switch?

A The switch, the one-cycle switch, but he just held the one-cycle switch closed. He didn't take his finger off. He just held his finger in there so the machine would continue to add during the period of the exhibit, and then he could put 100 turns in there if 100 is what he wanted to do, and then he could calculate what the results would be and verify this with a cathode-ray oscilloscope, an extended test as of this day.

Q I didn't hear that last.

A An extended test as of this day.

Q Which day?

A As of that day.

Q All right.

A Mainly about June of 1941.

Q Did you observe this actually going on?

A Sure.

Q While Dr. Mauchly was there?

A Sure.

Q Did you ever observe Dr. Mauchly actually punch any part of the machine while he was there?

A Sure.

Q Describe that?

A Well, I remember his helping Clifford Berry in various minor assembly work with the machine while he was there. You know, Clifford Berry -- there was development work on the machine going on at the time Clifford Berry was there, so this or that part of the machine was disassembled and some other item changed or modified, or whatever, and these operations in which some part was taken off the machine, I remember that there was considerable work going on on the brush holders, on some of the wiring harnesses while Dr. Mauchly was there, and I remember the work going on in the shop on the base two card reader, and then I know that Clifford was carrying on at that time work on the punching mechanism, and he had a separate little setup, not the main

machine, for recording numbers by the method which we proposed to use on this machine and which we broke down dielectric in order to record numbers, and I know that there was some work going on that on one of the benches nearby during the period. You see, on July 8th Clifford Berry was coming up for a Master's degree and this was pressuring him, and he felt that pressure a little bit.

Q Were there any other tests with the machine in operation while Dr. Mauchly was there, beyond what you have described?

A Well, I think this -- it may not be quite complete, but essentially, it represents what Dr. Mauchly saw as it relates to the computing machine itself. Of course, we had other tests on the add-subtract mechanism which we attached at that time a good deal of importance to the tests which I previously described and which were --

Q Have you, in connection with your work in respect to this matter, had occasion to participate in the building of a test set?

A I have.

(Atanasoff Deposition Exhibits Y and Y-1 marked for identification.)

BY MR. HALLADAY:

Q I have had marked Exhibits Y and Y-1 and I have put Exhibit Y before you.

MR. HALLADAY: And may it be understood, Mr. Dodds, that the marking is somewhat temporary, the reporter having had some difficulty getting to it, but he will make that identification more complete and official at another moment.

BY MR. HALLADAY:

Q I have put Atanasoff Deposition Exhibit Y before you, Dr. Atanasoff. Will you state what that is?

A That is a test set.

Q And can you tell us what is inside of it, at least in a general way?

A Well, the same thing in part; the things inside of it are the same things that were inside of the test set which was employed at that time. It contains a transformer, arrangement for furnishing the filament current for the add-subtract mechanism, which is in the other unit.

It contains a power supply inside of it for furnishing the positive voltages and the negative voltages which are employed in that add-subtract mechanism.

It also contains devices, just as the original test set did, for duplicating the input signals to the add-subtract mechanism so that they are under the operator's control, and can be demonstrated here.

It, however, in addition, contains two lights which are used to replace the meter movements of the

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original demonstrration. It was felt at the time that this machine was designed that the meter movement wasn't very good for demonstration to a large number of people, but the lights would be much better. The lights, however, improved -- however, involved some modern innovations because they have silicon control rectifiers in their physiognomy, and that is a device which, as a matter of fact, is a form of transistor.

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Now, with the exception of this device employing silicon control rectifiers to indicate the output of the add-subtract mechanism, this device is, as far as I know, a substantial reproduction of the original test set. I say as far as I know, because, you know, I don't have at hand any diagrams of the original test set so I can't say this condenser and this filter may be of slightly different connection or something of this kind, but the material meaning of this test set is the same as the material meaning of the test set as of that day.

As far as the registration of output of the add-subtract mechanism, this is a different arrangement.

Q You had earlier in describing the test set spoken of a tin box. Is there also a difference in respect to the material of the box?

A Oh, I guess not. I guess it's about the same thing.

Q Well, is it tin or is it some other kind of metal?

A It's steel coated with some metal, which I call tin. It's plated -- well, I don't know, it might be an aluminum box. Maybe it is an aluminum box. I guess this is an aluminum box. All right. I will give you a change in a minute.

Q Is there any other respect, so far as your memory is concerned, in which Exhibit Y differs from the test set that was employed in 1941?

A Well, it's got a wire here on it and a plug at the end, and that was true of the device as of that time for furnishing AC power to the test set, and on the other end it has a multiple conductor connected to a female end into which the add-subtract mechanism is plugged.

Q And turning your attention to Exhibit Y-1 how does that compare, if at all, with the add-subtract mechanism modules of 1941?

A As far as I know, there is no difference except those demanded by the available material of the day, which, as far as I have any reason to believe, are of no consequence. This is an exact replica. We have gone to great lengths, and the only way we had of doing it to make sure that each tube performs the same function as the tubes did in that day, not mixing the tubes up in here, we had this circuit diagram but we had to go, we had to look at that photograph of the underneath of the unit, and I think if you examine that photograph, and I will get the number for you here in a moment, it is 1406, and you looked at the underside of 1406 and compared it with the underside of this, and we believe --

Q Excuse me. Did you say 1406?

A I did, yes.

Q Is that correct? Well then, we have one with a different number on the back -- excuse me. I was looking -- you had two photographs in your hand and I was looking at the

back of one.

A Oh, thank you so much.

Q I am sorry.

A I am sorry.

Q 1406 is correct?

A 1406 is correct.

Q I am sorry for the interruption.

A And --

Q If you look --

A You will notice that like the item of the day, it contains one double triode --

Q Excuse me, Dr. Atanasoff. Please mention Exhibit Y-1 as you go along.

A Y-1, all right; Y sub 1 or Y super 1?

Q Y-1.

A Y-1, all right.

Q Lawyers have their own strange conventions.

A Like Y-1, like the item of the day, contains a center vacuum tube with grid cap on the top, but without any grid connections thereto. Probably the resistors are of different material. Some of the vacuum tubes came from nearly that day. We have them in old cartons. We received them in old cartons. I know these don't look like the old ones. These look like new ones but some accident of fate, but some of the vacuum tubes that have been used in these devices, we

produced four of them, where actually from approximately this date, and they are obtainable today only from the purveyors of old and obsolete tubes, of which Arcturus is one.

We had no drawing of the scale and we used a method of scaling this picture to get the size and we believe this is within a quarter of an inch on the exact size. I remember the exact shape of this chassis which is depicted in the picture.

Q Picture 1406?

A Picture 1406. There was a change in material here. I remember that those chassis were mounted upon, I mean the metal bases of that day were of steel, cadmium plated to avoid rusting, and this one, not wishing to buy steel and have it bent and then have it cadmium plated, we just used aluminum, which makes no substantial difference.

Q What about the material of the wires? Is there a difference or a similarity between that in Exhibit Y-1 and the module of 1941?

A You can be sure that that was the push-back wire, wax coated, and these wires are of plastic. Then we have three or four condensers in the structure of the machine, and the condensers are a little different. The condensers of that day were of paper insulation, and these condensers are of Mylar.

Q Of what?

A Mylar, M-y-l-a-r, I believe.

Q What other differences are there in Exhibit Y-1 and an add-subtract module vintage 1941?

A Electrically, there are, to my knowledge, no differences. There are a few physical differences. I believe the plug here, the female plug contains one more wire, has one more position available. I believe those were ten prong. I believe if you count them you will find that is ten prong in the picture.

Q Picture 1406?

A Picture 1406. It is ten. I believe this one is eleven. If I got it changed as I planned to change it, it is eleven. I counted twelve. I guess it's eleven. I will have to count it again. That's the only thing I can do.

Q Will you do that so as to be certain, please?

A One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve. It is twelve, I guess. Twelve. That one is a ten.

Q That one meaning --

A Meaning the one depicted in 1406 is ten. We used the grounded chassis to carry one lead here. This is -- it was very hard to get such things in those days and -- I want to count this once more. That seems to be ten without any question.

Q You say "that seems to be ten." You are referring

to what?

A The plug in the photograph 1406 seems to be ten and the plug in the module under discussion here seems to contain twelve points.

Q What difference does that make, if any?

A It means a slight difference. The connections inside of the machine are exactly the same but there's some differences in the lead-in wires, some slight change in the lead-in wires.

Q Can you tell us whether or not if Exhibit Y operates properly can be employed to illustrate the operation of a test set on an add-subtract mechanism?

A It can.

Q Do you have a power supply beneath your feet there?

A None available. They are all in use.

Q Well, is there a spare there?

MR. HALLADAY: That is a telephone outlet, Mr. Fallon.

BY MR. HALLADAY:

Q Will it bother it to be used in an octopus type arrangement?

A I don't know. We will see. Thank you.

Q Dr. Atanasoff, will you describe the appearance of the test set in the condition which it had immediately after you connected the plub to the power supply with respect to the

lights?

A Well, when I connected the plug to the power supply there was a transient phase which caused both lights C and light A on the face of the test set to glow.

E-35-1

Q Now, directing your attention to Exhibit Y, there are two objects labeled respectively from left to right as those of us around the table look at it, C and A?

A Yes.

Q They are, of course, reversed to you unless you crane your neck and look at it from the front with us. What are those intended to be?

A Those are two little incandescent lights which are controlled by silicon control rectifiers interlocked with the electronic circuit, the electronic circuit, of course, connected by the cable to the add-subtract mechanism.

Q Now, on the, or in connection with the test set that was employed in 1941 which you have said had two needle meters, in what respect does the appearance of the lights on the test set, Exhibit Y, correspond to what showing there would have been on the meters of 1941?

A Well, the lights have two states, a zero represented by a dark condition and a one represented by a lighted condition. Each light has two states, the meter had two positions, roughly speaking, a low position and a high position, and the satisfactory operation of the digital computer, it's either -- it never -- it's never a hybrid, it's either on or it's off, and that's characteristic of the whole digital principle, and according to this, the meter never read medium, it just always read low or high, and likewise

the lights never read medium, either read on or off, and these on or off characteristics are those which describe the digits of the base two system.

Q And then further referring to the legend C and the legend A with respect to the lights, do those legends have any connection to any legendry on any drawings or diagrams?

A They do.

Q State that connection?

A Well, the legend A indicates a number to the right below the line in the sum or difference and the number C indicates the number to be written at the top of the next column as a carryover into that place.

Q Directing your attention to Exhibit W -- excuse me -- and the box pertaining to the add-subtract mechanism depicted thereon, is there any connection between the A on Exhibit Y and the A inside of the add-subtract mechanism box on Exhibit W?

A Well, you see -- yes, there is. That A is an output. I should describe the add-subtract mechanism as depicted in Exhibit W.

Q Will you do so?

A As having a series of letters thereon, A, B, F, G, D, E, and C thereon, well, these -- of these letters A -- I am sorry, B denotes an input into the add-subtract mechanism. Also D denotes an input from the other memory , KA memory; also E represents an input from the carry mechanism.

C and A represent the two outputs of the add-subtract mechanism. Now, you see the two outputs are depicted here by the lights, it doesn't connect to anything in this case, it just gives an indication of what goes there instead of being connected electronically, it just gives us an indication of what goes there, and here at the top are three buttons and those buttons are the three buttons which denote the inputs and instead of having a connection between this device and the rest of the circuit, we get the inputs back by pressing our fingers upon these buttons and buttons B, D and E denote the equivalent circuit connected into the mechanism, add-subtract mechanism, as of this point right here into item B -- D, is it? Is it D there on the block diagram? I am sorry. The D there, D here is the, corresponds to the D there.

Q Excuse me, Dr. Atanasoff. We will get the record confused if we say D here and D there, and I am sorry for these interruptions.

A Yes. D on the Exhibit, what is it, Y?

Q Y.

A On Exhibit Y corresponds to the letter D on Exhibit W and E on Exhibit Y corresponds to E on Exhibit W. So that there is a one to one correspondence, and we can, if we please, use this device to test the operation of the module statically as we did in that day except that here we have different kinds

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W-15-2

of outputs in the test set.

Q Then directing your attention back to Exhibit Y on the part that has the label on it, there is another device that protrudes from it above which is a "A" and below which is a "S". What is that device and what does the A and S mean?

A That is a switch, the switch controls certain voltages which are supplied to the add-subtract mechanism. These voltages instruct the add-subtract mechanism to either add or subtract as the case may be; and A on that switch means that the switch is instructing the thing to add and S on that switch means that the switch is instructing the add-subtract mechanism, Exhibit Y prime or Y-1?

Q Y-1.

A Y-1, to subtract.

Q With respect to Exhibit Y-1, are the glass objects thereon what you and I have heretofore had some trouble, I insist on calling them tubes and you call them envelopes?

A Yes. That is a sufficient agreement, tubes or envelopes. I hate to have you call them triodes because each one of these envelopes or tubes contains two triodes, that's my argument.

Q. If I say a triode you automatically think --

A Of a half a one.

Q Only describing half of it?

A Yes.

Q All right. Now, can you say in words how you went about employing the test set while Dr. Mauchly visited you at times in June of 1941?

A Yes.

Q Will you do so?

A We outlined the elements of base two computation. I will now do so on the board employing a crayon.

Q Shall we take and give you a fresh sheet?

A That is not necessary but --

Q It might help a little bit. And before we go further, let's have the reporter identify that sheet in case someone else wants to refer to it.

(Atanasoff Deposition Exhibit Z marked for identification.)

BY MR. HALLADAY:

Q Will you observe, Dr. Atanasoff, in a lawyer's laborious way I have now had your first sheet that was used for instructional purposes with respect to base two, base ten numbering systems, marked Atanasoff Deposition Exhibit Z?

A I observe that.

Q All right. Will you now, using the sheet before you, give us the preliminaries to a static test?

A I would just like to have a little order here as I go. I will use this for reference to make sure what I do corresponds exactly to that, and I am going to --

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Q Could you please speak up?

A I will try. And I will try to get -- I have never been noted for speaking low before. I must be running out of juice.

Let's see, I am going to try to commence to bring my notation into relationship with figure 1 so that when we get through we will understand what we are talking about. Now, in addition we have the following mental sums. Now, you remember we have one part which comes from CA which corresponds to -- enters upon the circuits at a point B, and I am going to put a "B" right there in parenthesis. This is just for my reference purposes, and then, that is one of the numbers to be added.

And here is another number to be added, it is a KA which enters the picture. KA enters the picture throu these devices and back over here into D, so I will put a D there. As far as getting in a computing structure, it will enter by way of that regenerative circuit back into D. And then there is also the carry up here, and the carry enters the picture right here by way of E.

Now, the kind of numbers we have I will depict next. We have such sums as this (indicating), and then sums employing two 1's, and that describes, and then one more sum which has all 1's; and those are the different kinds of elemental additions which you can have and those are the ones

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that this machine must be capable of doing.

Q Which machine?

A The add-subtract mechanism of the current device.

Now, we know what the answers are in each case and we will write them down and then we will label them and then we will do them on the machine.

Now, this one should give, oh, there was one that went before that, went like this, didn't it, I forgot one. Now, that 1 came out zero. Now, this 1 comes out 1. This 1 comes out 1, that 1 comes out 1, but the 1 means 1 in that position, but it doesn't supply an impulse to be carried into the next position, but here we get a zero in that position but carries 1 into the next position, and I will tell you where that appears there in a moment. This also gives one zero and this gives one zero and this gives one one. Let's do these elementary systems on the test set. I hope the darn thing works.

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Q It's on subtract?

A I am now approaching the test set --

Q Thank you.

A Exhibit Y.

Q Yes. And --

A I am about to put my fingers on the various buttons, on the red buttons on the top thereof.

Q Is it on add or subtract?

A And it should be on add since I am working on a problem of addition, and I move the lever to the add position. Thank you, sir. That is hard to understand. We will press the button, notice all three buttons are up, meaning all three zeroes, we have already verified this, haven't we?

All right. Now, that one there means push button B but leave the others. Now, there is light there and that means into this position goes one but there is none into the carry position indicated by the letter C below.

All right. Now, the next one says push button E. I push it. It gives me the same result.

This one says push button D. I push it. And it gives me the same result, giving me a one in that position, and I could have written it here if you like. Maybe I should, giving me a zero in the next position, and of course this has two zeroes there, doesn't it?

Now, we are going to try pushing two

buttons and it says there in the first column to push E and B. Now, you notice in that position, the position A, the light is out, meaning put a zero in that position, but the light connected with C is lighted, meaning 1 in that position and accurately depicting the conditions which are required there.

The next one says push E and D, E and D. Again we have the carry button, the carry output lighted, showing that we have a 1 in that position and a zero in the position where we are doing the addition, that is, in the A column.

Now, we have the third two buttons E and D, or did I do three already?

MR. FALLON: You didn't do B and D.

THE WITNESS: I didn't do B and D. All right. I didn't do B and D yet. I will do B and D next. You notice the result is just the same.

And now we are going to push all three. You know that they are both lighted meaning 1 in that position and 1 in that carry position; and that means that this device is operative at the moment as measured by the test set in a problem in addition.

Let's do a problem in addition, just working it out instead of using our heads, let's just do a very short problem in addition where we have to carry and everything of that kind. I am fooling around

just to make a problem as illustrative as possible, but I will just go through with that.

Now, I am going to label these just as I did there. You see I am going to label this one B, and I will label this one D, and up above is E, and I haven't got any numbers written in E, so I push B and D. It says to put down a zero and carry one, doesn't it, so I do it. I push B and D, it says the same thing, put down a zero and carry one. Now, I push E and D, it says the same thing, put down a zero and carry a one.

Now we press all three and it says put down a zero and carry one. Now, watch me, I carry it right up into that position and then I push only E and that says put down a 1 below and quit.

MR. FALLON: Is that right, this one?

THE WITNESS: Is there something wrong in there? We are -- I pushed the wrong thing. Allow me to go back and do this place over again. I should push E and B and D there, and now we get the right results, it says put down a 1 and carry 1. Now I am correct in it and now it says push the E alone.

Now, the machine actually does this automatically. That's all that's going on inside the machine is that operation, and I would like to -- shall I give the table for subtraction?

Q No. Before that, just for further illustration, will you put the decimal equivalents? Would you please down below show how you arrived at the conclusion that one one zero zero zero in the binary system is the same as 24 in the decimal system?

A Yes. Now, this is in the fourth place which means the power is three here, so that one there is equal to 8 and this one is equal to 16, and 16 plus 8 is 24.

MR. HALLADAY: It would be convenient for me, because of some personal commitments, if we adjourn at this time, and what is the reporter's pleasure as to tomorrow morning, and yours, Mr. Dodds?

MR. DODDS: Any time you say.

MR. HALLADAY: How about 9:15?

MR. DODDS: That is fine.

(Whereupon an adjournment was taken until 9:15 o'clock A.M., December 4, 1968.)

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VOLUME VII

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

Honeywell, Inc., Plaintiff,	
-vs-	4-67 Civ. 138
Sperry Rand Corporation and Illinois Scientific Developments, Inc., Defendants.	

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 9:25 o'clock a.m., December 4, 1968.

(APPEARANCES AS HERETOFORE NOTED.)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

DIRECT EXAMINATION (Cont'd.)

(Atanasoff Deposition Exhibit W-1 marked for identification.)

MR. HALLADAY: For the record, may it be understood, Mr. Dodds, that I have had a sticker made and marked Atanasoff Deposition Exhibit W-1 to put on the plastic overlay that we have positioned on Atanasoff Deposition Exhibit W so that it will have its own identification, and that I am placing that sticker at the top of Exhibit W-1 so that for future reference it will give us the top of the overlay.

BY MR. HALLADAY:

Q You observe what I have done, Dr. Atanasoff?

A I do.

Q Then yesterday at about the point of recess Mr. Fallon, I think it was, called to our attention the fact that in the drawing which you had done on what has now been marked Exhibit W-1, the effect of the overlay when examined separately makes it appear as if there is a gap in the wiring that is on that overlay whereas the wiring shows up when the

overlay is flat up against the background of Exhibit W. Would you be good enough to step to the board, Dr. Atanasoff, and complete the wiring diagram on the overlay Exhibit W-1?

A Right.

Q Now, if you lift, does it now appear that the wiring corrections are completed on the overlay Exhibit W-1?

A It does.

Q Thank you. Yesterday you were employing Atanasoff Deposition Exhibit Y in connection with Atanasoff Deposition Exhibit Y-1 to illustrate for us the employment of those devices as a test set for the purposes of accomplishing addition, at least in a general way that was the subject matter of the discussion at that time. Now, I would like to ask you this question: In what way, if any, can the test set Exhibit Y connected to Y-1 be employed to demonstrate the action of Exhibit Y-1 in performing subtraction?

A The first step is to reach this lever and push it downward so ithat it is in a position of subtraction, whereupon certain voltages are induced in certain leads which pass into the add-subtract mechanism which order the add-subtract mechanism to stop adding and start subtracting. I will now place a problem of subtraction on the board, and we will go through that problem of subtraction using the test set and add-subtract mechanism to give us the orders or the logic of the steps.

W-2

Q Before we -- excuse me. Before we do that, perhaps I can remove the sheet on which you had written your addition problem and have it marked so that we will have a record of identification, and then we will start with a separate sheet for subtraction.

(Atanasoff Deposition Exhibit AA marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, just for the record, you observe that the sheet that you employed yesterday to illustrate addition in connection with your demonstration of the test set, Exhibit Y, connected to module Y-1 has now for the record been marked Atanasoff Deposition Exhibit AA?

A I cannot verify the AA.

Q Showing you a sheet which has been marked, will you identify it?

A I now identify it.

Q Then, please, will you give us a statement on subtraction in the binary mode?

A We have a little problem. Oh, it might as well be this one, I guess.

Q Would you be good enough to write "subtraction" at the top of the sheet to correspond with a similar identification on Exhibit AA, please?

A Is this Y? What is the name of this?

Q The test set box identified as Exhibit Y. Do you want, Dr. Atanasoff, figure 1, which is Deposition Exhibit --

A I do. I want it where I can see it.

Q Exhibit W.

A I will need it where I can see it. Just set it up there. I will need to glance at it only a moment or two.

Q Dr. Atanasoff, a technical interference by the lawyer. You have written at the top of this sheet, "Subtraction with Exhibits Y and Y prime" and it is really Y-1. Thank you.

A Correct. Now, you know this is going in KA -- I am sorry, CA and CA enters the picture by way of (B), and this one is, this one is KA and KA enters the picture by way of (D), and then we are also going to put the carry-overs above and the carry-overs are being carried up above and they enter the picture by way of (E).

All right. So we are ready to begin. We have put a one --

Q Excuse me, Dr. Atanasoff. For the record, you have entered certain numerals or digits on a chart before us?

A I have.

Q Will you state what they are?

A I have put a digit above one one zero one and below one zero one one to illustrate subtraction. The one one zero one is thirteen and the one zero one one happens to be 11, if my calculation is correct.

Now, I am going to enter -- of course, here we have no carry-over into the first place at the right, no carry-over, and there is really a zero there, and so I put -- I do not touch (E) but (B) I push and (D) I push, and I don't get a thing so I put down a zero here. That means nothing, and I put a zero up here. I now push the one, I have only one and (D) to push. So I push one and (D) and they both light, they both light, don't they, so I put down one and I carry one. And now I have (E) and a (B). (E) and a (B). I push them both and nothing happens, so I put down zero and carry nothing, and then I push the (B) and (D) and nothing happens, so I get zero, and that answer is equal to two, and that is verified at the right.

Q Did you, while Dr. Mauchly was at Ames, engage in a test of an add-subtract module of the sort which you have just now done on Exhibit Y connected to Y-1?

A I did, with a single exception, that instead of using lights as an indicating instrument, the test set as of that day employed moving vane meters, moving needle meters.

Q Did you ever observe while Dr. Mauchly was at Ames any manipulation by him of the test set?

A I am not sure whether I observe manipulation. He was free to manipulate it , but I have no memory of this.

Q While Dr. Mauchly was at Ames on this occasion that has been the subjectof your testimony, did you describe to him

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the use of your machine in solving equasions in any way?

A I did.

Q Can you tell us your best memory of what you said on that subject?

A Well, of course, I had explained to Dr. Mauchly my interest in large systems of simultaneous equasions and the reason why I have been motivated to build this machine, this computing machine, and he was aware of it. Of course, he understood the problem of systems of equasions without, I believe, as far as I am aware, having any particular experience in large systems at that time, and so he was keenly interested in it.

Q Can you remember what you said about how your machine was intended to solve such systems of equasions?

A I do not remember much of the conversation, but one aspect of the conversation is very clear to me. I believe I spoke yesterday about division. The reason division enters into the solution of systems of equasions is that we use the division to eliminate an unknown, an effective division to eliminate an unknown. I was at that moment deeply aware of the method which was used by division in a Monroe or a Marchant, I guess was in existence at that time, in which you first do a subtraction until you overrun, then add it back in one and then shift, and, of course, such patterns had been in my mind as I planned the operation of this machine.

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Now, this particular scheme of division wastes a little time while you overrun and back up and go ahead, but in base ten this waste of time is not large because you subtract perhaps an average of five times, then you subtract one additional time and then I believe they subtract an average of four and a half times. Then you subtract an additional time, that's one count. Then you add an additional one point count, so you have raised the effort from four and a half to six. But when you apply that method to the base two system, the method of operation is quite different, because you subtract on the average of a half time. Then you certainly take one additional one to overrun and then you take an additional one to come back, so you have increased your efforts from one-half to two and a half. So this is an odious principle for division, and I devised a different one, and I explained this different principle to Mauchly at that time.

EA#3-1

Q Will you state what your explanation was?

A I stated as follows: That what you did, you subtracted until you overrun, you immediately shift, you add until you overrun and then you immediately shift and continue this process. Then a simple accounting of the number of times you subtract in the overrun and add in the overrun gives immediate evidence of the quotient.

Q Is such an action demonstrable on the test set with the operator doing the shifting?

A I believe not.

Q All right.

A I believe not, no, because a test set means, you see, you have subtracted a long series of numbers and then overrun -- the overrunning I could demonstrate on the blackboard without the use of a test set perhaps better.

Q Would you do so?

A I will have two long numbers and I trust you will bear with me that these are base two numbers.

Q Draw a line below what you have done there now to separate the parts?

A I have drawn a wavy line to separate the two materials.

All right. Now, I am going to divide this number into that one but you will have to keep track that's what I am doing.

Q Would you be good enough to state what number you are dividing into what number?

A I am dividing one one zero one one by one zero one zero zero. Do you wish the English -- I mean the Arabic, the decimal equivalents of these?

Q Would you please?

A Yes, sir. I am dividing twenty-seven by twenty-four.

MR. FALLON: No.

THE WITNESS: Is what I am doing. Now, what we do --

MR. HALLADAY: If you want to check your figures for accuracy?

THE WITNESS: Is there something wrong with that?

MR. FALLON: Your divisor.

THE WITNESS: It is wrong. Twenty. Thank you, gentlemen. I like the problem better. Let's see, you subtract, and when you subtract, now I am going to add -- I am going to subtract, and subtraction gives me the following results -- I am sorry -- gives me one one one. I inadvertently got myself messed up with binary decimals, but I guess I can survive the onslaught. Well, as usual, I have -- I haven't carried through yet. You know I got some zeroes out here on the machine, I haven't carried through into those.

All right. Go ahead and subtract it again. That's what we mean by carrying through, carries through then the machine with ones, just like the ordinary computing machine carries through with nines into the machine, same old process. All right. Now, just keep track of what I have done there and I have got -- I have subtracted twice in the first position. The first position I have subtracted twice until I carried through. Now, just keep a record of what I have done that way and then we will interpret that record in a moment. Okay.

Now, what I do is add until I carry through in the next position. And, of course, this is the only -- the only digit that I have before the decimal, but I am going to just add, I am going to now shift my divisor to the right just as you ordinarily shift it, and watch me now, you better watch me, I guess. I got some more zeroes out here. Yes. I guess so, yes. And I add, I did not carry through. I mean I did not remove a carry-through is what I meant by those words. So I will add again. I did carry through. So in the second place I added twice.

Now, I will shift and start subtracting. I shift this number towards the right and it

now becomes, it don't matter about those zeroes on the right because we are keeping everything in order. I subtract. Am I right? That's right. I did not carry through so I subtract again and I will do that down below. I get the zeroes over here, and I hope you are helping to keep this straight -- Now, I have now subtracted in the third place. Did I subtract twice? I did subtract twice.

Now, we will go to a fourth place and I have to carry the thing up here, and then I will have to show you that this is running it out in base two decimals. The quotient is being carried out, and we will do the quotient in our mind here, and it turns out in our mind to be one point thirty-five in the decimal notation. I think we can easily verify that, now we will forget that and in the binary notation we will carry this out. I have a long succession of ones and finally come to a zero one zero zero and the one was just to the left of this zero. I had the one here before, but I now shift again and I am going to add so I shift it to here and I now add. This is in the fourth place and I add again and I have now carried out -- now, we have an interesting result there, you notice I have added twice, but you know now I will attempt to

5

the interpretation of these counts here as a quotient thereof, you see. You keep track of it this time. The quotient I subtracted twice. Of course, when you subtract that gives you one so I really have as a result of this, I have the first estimate one zero, first estimate of the quotient is one zero point; subtraction twice is two and two in the binary notion is one zero, right?

Now I have added twice here but addition is not the usual practice in subtraction so I have added twice. So now I now have to put a correction in there and the correction looks like this. This is just an interpretation of that notation in the binary system. Now, this here means I added, I did divide twice and it means a plus in the binary notation, that's a third term entering the picture in that way, and the fourth term entering it like this, also shifted over there still one further. So now we will work out that decimal, work out that decimal as an approximation of the quotient in the base two system, as an approximation of the quotient of the base two system. Let's see this one is minus, of course. Now, one comes out, of course, going to put a one there, isn't it, and that comes out next plus one borrowing that and leaving, that has been borrowed, so it's nothing there. Now, in the next place we have a

s

one, so that is a quotient. It doesn't seem quite right. I wonder if I got a mistake in there. I know when I get it going. This problem is entirely contrived so I could easily have an error. I don't remember what it ought to be, I have a feeling for what it jought to be. Let's see? Two is clearly too much for the quotient. All right. And we subtract this and that is clearly too small for the quotient so far, and then we add a half, yes, I am interpreting this wrong anyhow. Okay. All right. I have here, and I will interpret this for you. I will interpret this for you. That is one point two five, that's the answer that I get at present, one point two five, not a very good approximation of one point three five, but watch, if you please. Notice I am getting a repetition of the subtraction there. So we see this should go on exactly that way forever. I hope I am right.

In other words, this answer became a repeating decimal in the base two system, while not a repeating decimal in the base ten system it is a repeating decimal in the base two system and we will have to interpret that result. And let's -- I will write this down for you. This is one, of course.

Now, interpreting it, this is twenty-five hundreths. This one here is, this is a sixteenth,

zero six, this is something else, we are getting closer to the answer, we are at that position right now, and that illustrates the method of division which I had in mind.

Now, you may say, well, in this case that method of division didn't help us a darn bit. Well, the whole base two system didn't help us a bit here but, of course, we have to do with complex numbers where no regularity exists anyway and so this non-existence of regularity here is just typical of the general situation.

E-3-2

Q Do you recall whether or not while Dr. Mauchly was at Ames, engaging in any writing of the character you have done here for illustrative purposes?

A I did. I did, yes. I went over this system of division with him very carefully. I am sure it was not the same example because it's no way that it could have been.

Q While Dr. Mauchly was there, did you have the machine at that time in any condition where it could illustrate subtraction and division of the sort you have here described?

MR. DODDS: Objected to as leading.

THE WITNESS: Well, I would simply say that we had no controls suitable for detecting overdraft at the time Mauchly was there, no control, no detecting device suitable for detecting overdrafts, those were later incorporated in the machine and those were not mentioned yesterday, but they comprised an important part of the machine, and no control suitable for controlling division by any method including this one.

BY MR. HALLADAY:

Q Did you discuss that subject with Dr. Mauchly while he was there?

A Yes. Well, he understood clearly -- wait a minute, doggone it.

Q Did you discuss that subject with him?

A I stated to him that, of course, controls would be

devised for this purpose.

Q Did you state to him the character of those controls?

A I stated to him the general character of those controls.

Q What did you say?

A I do not remember.

Q What was the gist of what you said?

A That there would be controls for the purposes of controlling division, was the gist of what I said and that it would be detection of overdraft and this detection of overdraft would control the operations in the way that has been specified herein by the example which you have just been given.

Q Did you describe those controls in terms of their components, their parts or of what they would consist in any way?

A Only the general principles were discussed.

Q Describe those principles?

A The principles are the ones that have been illustrated on the blackboard at length in the division which has been given.

Q Do you have your original documents with you this morning?

A I do.

Q Dr. Atanasoff, would you please in those documents turn to --

A B-10?

Q Folder B-10?

A We will.

Q And see if you can locate in that folder Exhibit 93, a letter dated May 31, 1941, from yourself to Dr. Mauchly?

A I do. I have located it.

Q In the second paragraph of that letter there is a reference to, "An idea as to how the computing machine which we are building can be converted into an integraph," do you observe the reference that I have just read?

A I observe that reference.

Q In Exhibit 93?

A I do.

Q While Dr. Mauchly was at Ames on this occasion that you have been describing, was that subject discussed at all?

A It was discussed.

Q And you recall now what the discussion was?

A I can give you the subject matter and the gist of the conversation.

Q Would you do so, please?

A At that time the literature was full of the Bush Integraph. This is a device constructed by Dr. Vannevar Bush of Massachusetts Institute of Technology to solve differential equasions, integral equasions and various problems of that type.

As I look back upon the history of the

integraph, of course, I realize it represented a kind of a mechano-toy of the era in which we had some parts which could be put together to simulate the -- to simulate the differential, differential of other equasions in question which would then be used to simulate a solution. It was strictly an analog device. I had attempted, as it is recorded, that I have attempted to solve systems of linear equasions by analog methods. This effort had finally been abandoned because of one principal thing, and that is accuracy, accuracy which is attainable in these terms, and this question of accuracy continually beset the people who built differential analyzers.

W-4-1

Q All right.

A I have used two terms here, differential analyzer and Bush Integraph as equivalents. Please record that they are essential for the purposes of my present discourse, that they are essential equivalents.

Now, the fact that occurred to me as I wrote this letter on that day was that if you would stop trying to do the integration by the analog principles like wheel and disk or ball and disk type integraters, and do the integration, replace integration by a numerical type of integration in which you use small increments and counters, and which methods were becoming very available to me in the terms which I was coming to be possessed of, why, one could remove this problem of accuracy without carrying the burden of great accuracy in the parts; if you wanted ten times as accurate you had to make your parts ten times as accurate, and if you make your parts ten times as accurate, pretty soon you run out of accuracy. You just can't do it. So -- but, in problems of numerical integration -- by methods of numerical integration this limit is not upon you. This is the story that -- this is what I had in mind at the time I wrote this letter and this is the story I told Dr. Mauchly during his visit.

Q Did you describe to Dr. Mauchly the method that you then had in mind, if any, to convert the machine that you were

then building into an integraph?

A I am not sure how I should answer this question, inasmuch as I had no active plans for converting my machine as it stood into an integraph. I had no active plans. These were theoretical plans and they hadn't been formulated into terms of exact machinery, and vacuum --well, the vacuum tubes would be the vacuum tubes of the counters in question, but the exact interrelation of the parts in order to do a structure analogous to Bush's had not been worked out, and as far as I know, had not at this moment been worked out. They could be worked out, that I will assert and they could have been worked out at the day if I had turned my attention, as of that day, if I had turned my attention to it, or they could be today.

Q One point that I had forgotten to ask you yesterday, Dr. Atanasoff, which has nothing to do with the questions I have been asking you now. It just popped into my head.

On the test set Exhibit Y and the module, Exhibit Y-1 subject, the envelopes or tubes on Exhibit Y-1 have not been identified for the record other than by saying they are Arcturus, that they were dual triodes and they had grid caps and some of them had leads.

Is there another description for such tubes?

A There is a description which was historically common use and is now largely unused, but it is, the

description is 6C8G, 6C8G. Now, the C and the G are capital.

Q Then yesterday in looking at Exhibit Y-1 it was difficult to see whether or not on the glass there was a representation of that nomenclature.

A They have gotten to where they appear on the glass very very faintly of late years, and you have a heck of a time finding it. I don't know whether I can find it here or not.

Q In any event, are those tubes identical?

A They are identical.

Q In Exhibit Y-1?

A To the best of my knowledge and belief, they are identical and they are 6C8G's.

Q All right. Thank you.

A I don't see the darn thing but I think -- I see those numbers, but those numbers are different.

Q Well, on one of the envelopes in Exhibit Y-1, if you will permit me to --

A It would be something just about like that, barely visible.

Q If you permit me --

A Do you see one?

Q -- to move it, if you will look at the envelope nearest to the numerals seven seven eight on the base or chassis and the tube base itself has seven seven eight on it, and -- excuse me -- I know this is difficult, on the portion of the

tube which is nearest to the interior part of the chassis and nearest to the center place tube, is there something that is partially visible on that?

A Yes, the gentleman has found it. It's 6C8G, all right.

Q All right.

A It's hard to see, but it's there.

Q Is that identification on the tube that has the label on it seven seven eight on the base, just for the record? Permit me to turn it for you.

A I would have to take it out, I think, to tell.

VS 4/2/1

Q I am referring to the superimposed numerals on the base of the two. Do you see what I am indicating here, seven seven eight?

A Yes.

Q All I am trying to establish is that the faint six C eight G is on that particular tube, if you can see if it is.

A Well, I am in doubt, I mean, it's doubtless there and it's doubtless due to my eyesight that I cannot see it.

Q You can't see what?

A The six -- I see the seven seven eight, but not the six C eight G.

Q You and I aren't communicating well at all.

A No, we are not.

Q Let's find the seven seven eight.

A I see it.

Q On the base of --

A A vacuum tube.

Q A vacuum tube. Now, can you see whether or not that's the same tube that also has a very faint representation of six C eight G on it, or is it a different one?

A I see what you meant. It is the same one. I thought you had gone around to the other side and trying to show it to me.

Q No, sir.

A I am sorry.

Q Now, diverting from the diversion and taking your mind back to Dr. Mauchly's visit to Ames in June of 1941, while Dr. Mauchly was there, did he say anything to you about any concept of his own concerning computers?

A I have researched my memory exhaustively. I have stated previously that the only thing that I can remember connected with a digital computing machine on his part -- now, I am using the word "digital" here because you must remember thathe worked on, he did describe to me the elements of his harmonic analyzer and harmonic analyzers and analog machine, but there's a sharp differentiation between an analog machine and a digital machine. The only work that could have any relation at all was a far cry from a digital machine, but the only work that he represented to me that could have any relation to a digital machine was his work involving the use of neon glow lamps. These neon glow lamps somebody had just at that time invented a plug type fuse that had a neon glow lamp in it so that when you screwed it in, when the fuse burned out, why the neon glow lamp would glow.

Now, that was the source -- I remember his describing to me that that was the source of his glow lamp, his neon glow lamp, and he told me that he had been experimenting with them. Beyond that, now, I am telling you that I cannot remember for sure. The evidence yesterday seems to indicate that he told me about that at the time I met him in

Philadelphia. Whether he again repeated those conversations or we had any conversation on this subject at the time he visited me in Ames, I am not sure.

Q Did he say anything further about any concept of his at that time?

A He did not.

Q Pertaining to a computing machine?

A He did not.

Q Did he during the visit to Ames, Iowa, describe to you any work done by him on or with or in connection with cosmic ray counters?

A I should remark that the cosmic ray counters were very much in the literature as of that time, but I remember no conversation between Dr. Mauchly and myself on this subject.

Q Did he tell you at that time in June of 1941 that he had built any kind of a ring counter?

MR. DODDS: Objected to as leading, and again, I have been fairly patient, but there has been a continuous series of leading questions, and I again reserve the right to move to strike testimony from the record which comprise answers to these leading questions.

THE WITNESS: Will you repeat the last question? I cannot answer it without --

MR. HALLADAY: Mr. Sutfin, would you

read the question, please?

(The question was read.)

THE WITNESS: He did not.

BY MR. HALLADAY:

Q Do you now recall so that you can tell us anything further about the discussions that you and Dr. Mauchly had on the subject at hand, of course, while he was in Ames, Iowa, on this occasion in June of 1941?

A Time is requested for reflection.

Q All right.

MR. HALLADAY: Maybe this would be a convenient time to take a recess.

MR. DODDS: It's all right with me.

(Recess taken.)

BY MR. HALLADAY:

Q Dr. Atanasoff, the question about which you asked an opportunity to reflect on simply was intended to be this way: Does anything more now come to your mind pertaining to the discussions which you and Dr. Mauchly had on the occasion of his visit to Ames, Iowa, that you have not in your testimony expressed to us?

A In spite of reflection -- I am sure there were many other matters, but in spite of reflection, I do not have one in hand.

Q Thank you.

MR. HALLADAY: For the record, would you, Mr. Sutfin, mark this as exhibit BB?

(Atanasoff Deposition Exhibit BB marked for identification.)

BY MR. HALLADAY:

Q Dr. Atanasoff, do you observe I have had the reporter mark as Atanasoff Deposition Exhibit BB, the sheets taken from the display board on which you had put your illustration of subtraction at the top and your illustration of division by subtraction, if I may call it that, at the foot underneath the wavy line?

A Yes, I do observe that.

Q Do you have a memory, Dr. Atanasoff -- strike that. I am sorry. I have forgotten something.

You had said earlier in your testimony, I believe, something about Dr. Mauchly asking for a copy or to take a copy with him of your manuscript which we have earlier referred to as Exhibits 455 or 456, at least I think you said something about that. Do you recall having so testified?

A Dr. Mauchly asked me during the time of his visit, Dr. Mauchly requested permission to take a copy of my manuscript with him. I denied this request, and to the best of my knowledge and belief, he did not take a copy away.

Q Does your memory tell you when next after he left Ames, if ever, you saw him again?

A My memory tells me, it's vivid about the occasion, it is slightly vague as to the date, but I was sitting at my desk at the Naval Ordnance Laboratory, and with only the slightest of warning, here came Dr. Mauchly.

W-4-2

Q When you say your desk at the Naval Ordnance Laboratory, where was that desk located?

A That desk was located in a large room, again, full of dirt, in which many men worked and in which there was a great loud continual din, not only of voices but of hammering in building, well, maybe building 184. I will be a little, I will qualify that slightly, building 184 of the gun factory, near the Anacostia River in Washington, D.C.

Q You have heretofore spoken of moving to White Oak. With respect to that, White Oak what?

A Maryland.

Q Approximately when did that move occur, as best you can recall?

A Oh, the move occurred, I believe that the plans had been formulated as early as 1945, and something like 1946 the move was under way, and, of course, it probably was 1947 or '48 before it was entirely completed by the laboratory.

Q Then will you describe for us, please, this next visit of Dr. Mauchly and yourself?

A Well, the way I remember it is that he just appeared. Now, it may have been that I got a very brief call or that my secretary got a brief call stating that he would arrive. I don't remember that call. The impression I have is that here he was, and why he was here and what it was all about, I did not know, because, of course, we were operating under condition

of severe security at the time and he came down with a normal clearance badge, probably confidential in level, and so he was cleared.

Q What took place at that time?

A We sat down and talked and we talked about what I was doing and what he was doing and we talked about computing machines.

Q Give us the conversation as best you can.

A Well, I am not going to be able to do very much for you here. I remember that he said he was working on some kind of a computer for the Army. Now, again, I am a little vague because this was the initial one of a series of visits and I don't know whether it was on this visit or on a subsequent visit that he made this disclosure. It may have been on the first visit, I will put it that way. He knew that my computing machine, or I told him, the discussion spoke of a computing machine on which I had worked, and I said it was back in Ames, and I didn't gain the impression that he was working full time on computer machines or anything of the like. You know, many --at the time, many universities had government projects of various kinds, and my principal memory of the event was my surprise at his arrival.

E-5-1

Q Will you turn to your folder B-10, please and Exhibit 95 therein, a letter from Dr. Mauchly to you of September 30, 1941. Do you have it before you?

A I have it before me.

Q In that letter in the fourth paragraph the following statement is made which I would like you to read with me:

"A number of different ideas has come to me recently anent computing circuits ---- some of which are more or less hybrids combining your methods with other things and some of which are nothing like your machine."

Are you reading with me?

A I am following.

Q "The question in my mind is this: Is there any objection from your point of view to my building some sort of a computer which incorporates some of the features of your machine? For the time being, of course, I shall be lucky to find time and material to do more than merely make exploratory tests of some of my different ideas with the hope of getting something very speedy, not too costly, etc."

The next paragraph:

"Ultimately a second question might come up, of course, and that is in the event that your predesign were to hold the field against all challengers and I got the Moore School interested in having something of

the sort, would the way be open for us to build a 'Atanasoff Calculator' (a la Bush Analyzer) here?"

Have you followed my reading of that excerpt from this?

A I have followed that reading, that is a matter of record in Exhibit 95.

Q In this first meeting with Dr. Mauchly at your desk in the building at the gun factory that you have just been referring to, tell us whether or not anything of like effect or purport was said to you by him on that occasion as this that I have just read from Exhibit 95?

A I remember some general discussions about the computing machines but no such request was made of me at that time to the best of my knowledge and belief.

Q To your best recollection was any request similar to that which I have just referred to made at any later time by Dr. Mauchly to you?

MR. DODDS: Objected to as leading.

THE WITNESS: I am uncertain as to the answer to this.

BY MR. HALLADAY:

Q In the discussion at the gun factory quarters that you have just been testifying about, what is your memory as to what Dr. Mauchly said about the work he was then doing in connection with computing machines or a computer?

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A He said he was working on a computing machine. He said it was classified and that was that.

Q Did he give you a verbal description of any of the components?

A I would like to ask a question here to refine -- I am not sure as to the question and the implication of the question.

Q You want to ask me a question?

A Am I testifying about the occasion of his first visit?

Q Yes.

A Alone?

Q Yes. Just that?

A All right. Then I am clear. He did not give me a statement of the components.

Q Did he say whether or not -- strike that. Did he describe to you verbally the principles that he was employing or attempting to employ in connection with the computing machine that he was then working on?

A I am uncertain. He may have told me that it was an electronic machine, except for that he did not describe the principles. I am even uncertain of that, but I have some such impression.

Q Did he then state to you the name or names of any persons other than himself who were engaged in that activity?

A On the occasion of his first visit to me?

Q Yes.

A No. The answer is no. To the best of my knowledge and belief the answer is no.

Q Can you now recall anything further about this first discussion that you have not told us?

A He remained with me only a short period of time, perhaps an hour or hour and a half, and then he went away.

Q Do you remember anything more of the discussions during that hour or hour and a half?

A I do not at this moment remember more of the discussions.

Q Were any persons other than the two of you present in company during that hour or hour and a half?

A I may have had the company of Mr. David W. Beecher during that time, during part of that time, not all of it.

Q Do you recall what, if any, conversation he participated in on that occasion?

A This is slightly ludicrous because if you knew Mr. Beecher you knew he didn't participate, he sat there and listened.

Q Do you recall what conversations occurred while he sat there and listened?

A I do not.

Q Do you have a recollection of seeing Dr. Mauchly

again after that?

A I do.

Q Can you tell us where?

A It was certainly in the same room in the gun factory.

Q Can you tell us how long after the first visit the second one occurred?

A Well, I suppose this is going on and on, and I have some impressions of this, and I suppose counsel is within his rights to ask me such questions. I will have to be rather sketchy as to my answers. I would like to testify as follows and see if this satisfies the inquiring mind of counsel. Over the next year or so, he came to my desk in the same building and in the subsequent building in which I worked a number of times, the number of times may have been five. During these visits there was some conversation about computing machines. I have no particular memory or refining information which I can furnish as to the nature of these conversations.

I remember that during at least the first three or four times my curiosity as to the means Dr. Mauchly used for gaining entrance to my desk was ever with me. In other words, I didn't know who was sponsoring him and how he was gaining entrance to the gun factory because it was a place of high security. He was in general cryptic about any activities he was engaged in other than his presence at the gun

factory. He exhibited interest in the work which I was doing and as his visits continued his interest in this work grew. I did not inquire how he managed to get in the gun factory at this time and no one ever told me, to the best of my knowledge an belief at the time, and since that time I have made an exhaustive inquiry to find out how he got in there and I have been -- I have located a number of the parties concerned and I have been unable to -- Ihave been unable to ascertain exactly how he was getting in. It's been of interest to me to know how he was getting in and I still don't know.

EA
5/2

Q What memory do you have as to any discussions in which you and he participated in which the subject of computing machines was brought up?

A We discussed -- we discussed memory and logic.

Q Can you tell us on which number of occasions this was discussed?

A I will not tell you because I do not know.

Q Do you recall whether it was discussed on one or more than one occasion?

A I believe it was discussed on several equations.

Q I think you said equations?

A Several occasions.

Q And can you give us the substance of that discussion?

A I cannot give you the substance of that discussion. I mean my memory does not enable me to give you the substance of that discussion. I have not reflected directly on this point and I -- on a question of this caliber -- and it seems to me as if I would have previously but sometimes counsel surprises me and I am unable to help further.

Q In any of those succeeding discussions what if anything did Dr. Mauchly tell you about what he was doing in the computing machine field?

A I have answered that question on probably two previous statements here. I will answer it again. He told me, to begin with, that the specific machine on which he was

working was classified and there were no details given beyond those that I have mentioned.

Q Do you have Exhibit 95 still before you?

A I do.

Q On any of the succeeding occasions about which you have been testifying, did he make a request to you like or similar to that contained in Exhibit 95?

A I do not remember such a request.

Q Have you ever met a man named J. Presper Eckert?

A I have.

Q What is your recollection of having met him for the first time?

A Well, I was in Building No. 210 in the gun factory in the Navy Yard in Washington, D.C. near the Anacostia River. I do not remember why I did not have a regular office in Building 210 on that occasion, but I was discovered there or perhaps I received a phone call and told to go there. Mr. Eckert and Dr. Mauchly arrived with a messenger because I was not surprised because this was the usual method for introducing visitors without need to know when specific clearance.

Q Can you tell us approximately when this event occurred?

A Oh, goodness, late in the war, perhaps 1944, say in August of 1944.

Q What transpired on that occasion?

A They told me they were interested in computing machines.

Q Will you give us your very best recollection of what the discussion was at that time, please?

A This is the only occasion -- I might remark that this is the only occasion on which I ever met Presper Eckert. They had come to me for something specific. They told me they had in mind to use a mercury delay line for a memory. They had attempted to do this and were having difficulty with this process. They were requesting my assistance in resolving the difficulties thereof. I believe some other -- I believe there were mutual discussions in regard to other forms of memory, but these -- my memory of these other discussions is vague.

Q How long did this discussion last?

A Oh, perhaps an hour and a half, hour, I am not sure.

Q Were any besides the three of you involved in the same?

A No.

Q Was any inquiry made of you at that time by either of them as to the then condition or state of your machine at Ames?

A I believe that there was, that there were words passed on this subject. They were casual words.

Q Did either of them then disclose to you in anything other, further or additional to what had been said to you before about the activities of either in computing machines?

A They told me they were interested in a mercury delay line memory.

Q Was there anything further said on that subject at that time?

A There was a good deal of discussion at that time on the subject of mercury delay line memories.

Q Can you give us a substance of that discussion?

A The subject of discussion was why in the hell -- pardon me -- why they wouldn't work. And I made some remarks on the subject.

Q Can you tell us what those remarks were?

A I remarked that the problem -- the reason that the thing wouldn't work was related to the subject of dispersion.

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Q Anything further?

A Well, the question was how to get rid of the dispersion.

Q Yes. Anything more?

A I told him that I thought that there were remedies, partial remedies available for getting rid of the dispersion, that there might be more drastic remedies which could be employed but these were of somewhat doubtful utility. We -- I told him that the dispersion was probably due to the interference of surface waves in the wave planes which traveled down the Mercury delay line -- I am sorry, the interference of the surface waves -- did I say that -- in the plane which traveled down the delay line. I pointed out that for effective operation, not only dispersion would have to be held down, but that the transducers which occupied the position at the end of the delay line would have to be devices capable of introducing a plane wave without distortion into the delay line.

Q When you use the term "plane wave," is it p-l-a-n-e or p-l-a-i-n?

A P-l-a-n-e.

Q What further occurred during this discussion between yourself, Dr. Mauchly and Mr. Eckert at that time?

A There was some discussion about how they would proceed to get me to help them more actively.

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Q Anything further?

A I don't remember the exact words or the content of the discussion, but I know that that was the subject that was discussed, and then they went away.

Q Did anything further occur in that connection thereafter?

A As far as I am concerned, nothing further occurred.

Q Did either of them at that time say anything to you about patents?

A The answer is no.

Q After that time, did you see Dr. Mauchly again?

A Well, I'm afraid that the general picture that I have attempted to give you of Dr. Mauchly's visits is incomplete. I did not intend that this should be so. Now, we can do, by the use of records I could do better than I am doing, but what actually happened was roughly this: There was first a period in which Mauchly arrived at my desk three or five times, or however many times at irregular intervals in which I was in doubt as to how in the heck he got there. Towards the end of that period, I didn't quite know what to do with Dr. Mauchly when he came and I introduced him to Dr. Ellingson, a member of my staff who was working on statistics, because I knew that Dr. Mauchly had been active in the field of statistics.

Towards the end of that time, he

commenced to spend more and more time with Dr. Ellingson and less and less with me on those visits.

Now, this resulted in the end to his being employed by the Naval Ordnance Laboratory to work in the field of statistics, and he came and did so work. His work consisted of discussions with Ellingson. This work, the time that he actively worked for us was of short duration, a period of several months, say, two or three times, two or three times -- oh, I don't know, a number of days a month, a number of days a month. He wasn't there only a relatively small fraction of the time. The number of the days of the month I have no memory of, but he was there a small fraction of the time.

Then later after my move to White Oak, he again visited me and the visits of Dr. John W. Mauchly to White Oak amounted to one or two, and at that time there was a further discussion of computing machines.

Q Have you finished the explanation?

A I have finished. I wanted to get a general explanation in to form a basis for further discussion.

Q Thank you. When, with reference to the visit of Dr. Mauchly and Mr. Eckert, did Dr. Mauchly enter into some employment type of relationship with the Naval Ordnance?

A Well, you have got the record, I haven't. I don't know.

Q I am simply asking whether it was before or after?

A I don't know.

Q You have no recollection?

A I have a recollection but it's a vague one and I do not attach certainly to it, and it seems to me that it's undesirable that I voice it.

Q On the occasions when Dr. Mauchly visited you at White Oak, Maryland, can you recall now what was said on the subject of computing machines?

A Everything was said on the subject of computing machine on those occasions, the subject of logic, the subject of-- we were going through our minds on that occasion through the subject of pulse versus static conditions within the logic circuits. You know, it was possible to build logic circuits which consist of individual counting of pulses and it's possible to build other logic circuits which are similar to the one that is close to my hand, in which an equilibrium condition comes to exist, and during the duration of the pulse, a substantial, and I want to be careful, a substantial equilibrium comes to exist during the length of the pulse, and there are perhaps other bases for construction of such elements, and these were discussed.

Q Who, if anyone, besides the two of you was present during these discussions?

A During these discussions there were other people

around who had an interest in the subject, and these would include the following: Shall I list some names?

Q If you would, please?

A I would have to reflect to be absolutely certain, Mr. Robert Elbourne, Mr. Calvin Mooers, Mr. David Bobroff, Dr. A. E. Brandt, Mr. David Beecher, and perhaps others. I perhaps don't think of all of them.

Q One name I missed, and I suspect the reporter did, too, David Bobroff?

A Bobroff.

Q Can you spell it?

A B-o-b-r-o-f-f.

Q At that time, what was your activity at the White Oak facility?

A At that time I was chief of a division of the Research Department. This division had to do with acoustics. It had to do with acoustic phenomena, both in air and in water. It had to do with seismic waves and it had to do with sonic waves. This gives -- of course, this has to do a great deal with electronics. This gives some idea of the activities of the division.

Q When did those visits at White Oak by Dr. Mauchly occur in relation to the work you have heretofore described on the Navy's computer project?

A The occurred during this project.

Q Was that during a period of time when Dr. Mauchly was, to your knowledge, in any employment relationship or its equivalent with the Navy?

A I believe that this occurred, that these visits to White Oak occurred entirely after that period of employment.

Q After the last visit, if I may call it that, the last contact you had with Dr. Mauchly while at White Oak, did you see him again personally at any time before the institution of the lawsuit with respect to which you are testifying?

A I did not.

Q In that interval of time from the last visit until the institution of the lawsuit, did you have any communications to or from Dr. Mauchly by telephone or by writing, by telegraph, or if there is another way or ways, such other way or ways?

A I did not.

MR. HALLADAY: I have no further questions at this time.

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CROSS-EXAMINATION

BY MR. DODDS:

Q Dr. Atanasoff, as you might expect, I have one or two questions.

I show you what purports to be a letter from Mr. Trexler to you dated February 23, 1943, a document which apparently is not found in your files, and ask if you can identify that as a copy of a letter which you received on or about that time?

MR. HALLADAY: Does it have some exhibit identification on it, Mr. Dodds?

MR. DODDS: Not at this point. This was a document, I might say, which was identified by Mr. Trexler during his deposition in another case.

THE WITNESS: What do you request of me?

BY MR. DODDS:

Q If you can identify this as being a copy of a letter which you received on or about the date it bears?

A I would have to do so by memory and my memory does not suffice for this. I presume I received it.

MR. HALLADAY: Can we have an identification of the case and the exhibit number, the deposition, if any, so we can determine what this is?

MR. DODDS: This is Exhibit PPX-35

identified during the deposition of Mr. Trexler in the case of Sperry-Rand versus Control Data.

MR. HALLADAY: Do you have a further reference to it by court or file number?

MR. DODDS: Civil -- it's in the District Court of Maryland, Civil Action No. 15823.

BY MR. DODDS:

Q I show you what purports to be a reproduction of a carbon copy of another letter from Mr. Trexler to you dated June 29, 1943, and ask if you can identify that document?

MR. HALLADAY: Could we have the exhibit identification, please?

MR. DODDS: In the same case, Exhibit PPX-36.

MR. FALLON: What was the question?

MR. DODDS: I asked him if he can identify this as a copy of a letter which he received from Mr. Trexler on or about the date indicated.

THE WITNESS: It's a reasonable request. The request of counsel is reasonable, of course In this case, I have a little feeling of warmth relative to the statement herein. It seems to me as if I might have received such a letter. I cannot be definite.

BY MR. DODDS:

Q You cannot definitely identify it?

A That's correct. If it were in my files, why, then, I would have a basis -- did you state that that was not in my files?

Q This was not found in your files that you produced here.

A Yes, of course.

Q Or that you showed --

A You know, I must presume in these cases, I must presume that I did receive the letters. I do so presume. I don't know what the correct form of reply to a request of this kind is. If I have any memory, I will state it.

Q Dr. Atanasoff, I show you another reproduction of a letter, a signed letter by yourself to Mr. Trexler dated April 28, 1968 -- did I say 1968?

A You did say '68, sir.

Q I am sorry, April 23, 1968.

A Yes.

Q From yourself to Dr. -- to Mr. Trexler, and ask you if you can identify that document?

MR. HALLADAY: Does that have an exhibit identification?

MR. DODDS: No.

THE WITNESS: This letter I did write. I recognize my signature and I remember the subject matter thereof.

MR. DODDS: I should like to have this marked in evidence as Defendants' pretrial exhibit Number One, and hereafter for brevity, I will merely use the designation DPX-1, the letter identified by the witness.

(Defendants' pretrial exhibit No. 1 marked for identification.)

Are you keeping copies of the exhibits? This is off the record. May we have an agreement that this is off the record?

MR. HALLADAY: Yes.

(Discussion off the record.)

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MR. HALLADAY: On the record. Mr. Dodds, while we were off the record, you asked me a question and I responded off the record. Do you want it off the record or on the record?

MR. DODDS: I am --

MR. HALLADAY: You exhibited to the witness two documents, one which you said was dated February 23, 1943, identified as PPX-35 in the deposition of a Mr. Trexler in the case of Sperry-Rand versus Control Data, File No. 15823, if I heard it and marked it down correctly, in the United States District Court for the District of Maryland; and another letter apparently from Mr. Trexler to Dr. Atanasoff of June 29, 1943, marked for identification in, apparently the same case, as PPX-36. I have not seen those documents that you exhibited to the witness and therefore have no further comment thereon except to ask you to give me copies of same . Since you exhibited them to the witness I think I am entitled to see them and to have a copy.

MR. DODDS: Since you decline to stipulate their authenticity and therefore it will be necessary to subpoena Mr. Trexler, I think appropriate time to distribute copies is when we ask Mr. Trexler to identify them.

MR. HALLADAY: In effect you ask me to stipulate to something which you showed one of to me and that's where it stopped so I have nothing to consider.

BY MR. DODDS:

Q Dr. Atanasoff, would you refer to your folder D-2, document 530, please?

A 530, is that the correct number, 530?

Q Just a minute. I don't find it in my folder D-2, a letter dated June 24, 1954, from Mr. Etienne to yourself.

A What is the date?

Q June 21, 1954?

A I have the letter.

Q Is it 530, is that the number, is that correct?

A It seems to be 530.

Q Yes.

A I am not sure I heard you correctly. I was asking.

Q The index indicates that letter is in that folder but it doesn't seem to be in my folder at the moment. You notice that that letter refers to a number of patents which Mr. Etienne says he is enclosing to you?

A Yes.

Q Did you receive those patents?

A I certainly received the letter and as to the patents

a search of my files fails to disclose a copy of 827, so I must presume I did not receive it.

Q You have no affirmative recollection that you did not receive it?

A I certainly do not because I only have the failure - I did not read that at that time -- I may have received it, but my habits of management of material which I receive are such that that should have been in my files and it's not in my files. I have not -- I have sought for the patent ending in digits 827, I have not sought in my files for the other two patents so I am not sure. I cannot speak as to them.

Q May I see that a second? The first paragraph of the letter expresses, "An appreciation for your courtesy in talking to me," I am quoting, "in talking to me extensively last Tuesday afternoon." Could you tell us of the circumstances of that visit?

A I received a communication from someone and I suppose it was Mr. Etienne stating he desired a conference with me. He arrived at my office which was then at the -- I was then operating a company which I had formed which had the name Ordnance Engineering Corporation. It was located in Rockville, Maryland, on the property adjacent to a -- I don't remember the exact address -- but it was on a property adjacent to a ready-mix concrete plant. He entered my office which was in the left rear of the building and sat

upon a red leather sofa which I had situate there. He discussed the subject of the then state of the patent situation relative to computing machines. He made certain statements to me relative to the work which I had done. As I remember it, the basis for this discussion was conversations that he previously had with Mr. Clifford Berry. He did not state the subject matter of any patent then issued or in progress, but he did discuss the relationships of the work I had done.

Q Relationships to what?

A To the general patent situation.

Q Was there any discussion of the 827 patent?

A There was no discussion of the 827 patent at that time.

Q The patent number was not even mentioned?

A To the best of my knowledge and belief, I have no memory of it. I believe it was not.

Q You notice Mr. Etienne states in his letter, "In accordance with my statement at that time," meaning the time of the visit, "I am enclosing for your files copies of a number of patents," including the 827 patent?

A I believe he did say he was going to send me some patents and he did. I have no further memory that I can give you on that matter.

Q Did you say Mr. Etienne initiated this visit?

A He did. Yes, sir.

Q And was anything else discussed other than what you have just related during Mr. Etienne's visit?

A You mean whether other subjects of discussion, is that your point?

Q Yes.

A Mr. Dodds, apparently there was another subject for discussion.

Q I am only interested in discussions relative to computers, of course.

A Quite correct, and I am trying to follow. I am, of course, trying to follow it as best I can. There was a discussion that I should join International Business Machines, support a suit by International Business Machines against somebody. Now, the somebody was -- had a name Rand connected with it, so it was then -- Sperry-Rand -- I think probably a predecessor of Sperry-Rand, that I should join them in a suit against Sperry-Rand or a predecessor thereof.

Q That was supposedly Remington Rand?

A It might have been Remington Rand, I am not sure.

Q How long did this discussion last?

A I would say that it lasted for an hour or so.

Q And in what manner did Mr. Etienne suggest that you "join" with IBM in contesting certain patent rights?

A My memory, for the sake of the record I will here state that my memory of the form of the questioning was such that I gather that these patents which were to be contested were still in the office. I do not know for sure that this was it, but this was the impression I got from his discussion. The manner -- I will continue -- the manner in which he asked that I should cooperate with IBM was in opening my files to access by IBM and by giving evidence thereto.

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Q Was there any discussion at that time about the ENIAC patent or patent application?

A I gained the impression, I don't know whether the word ENIAC was used, my memory does not suffice -- I gained the impression there were several patents which would be the subject of such litigation, more than one. I can't say several but more than one.

Q Were there in general patents of -- patents or patent applications in the names of Dr. Mauchly or Mr. Eckert or both?

A I believe that those names came into it, but I wasn't at all sure from the subject of that discussion that they were restricted to those names.

Q Did you have any subsequent discussions with Mr. Etienne?

A I have before me a letter which was written to me by Mr. Etienne.

Q The letter of June 21, 1954?

A Yes, sir.

Q Were there any subsequent discussions or correspondence with Mr. Etienne?

A After receiving the letter of June 21, 1954, all communications between me and the International Business Machines suddenly ceased.

Q I notice in Mr. Etienne's letter a statement,

"You will try to go through your documents with regard to your computer and that if you find any documents such as a draft of the patent applications which is directly in point with regard to the regenerative condenser feature, you will then consider whether you will turn a copy of this material over to us for our study enabling us to come to some kind of determination as to whether we shall proceed further." Did you in fact go through your documents and supply any copies of any of them to Mr. Etienne?

MR. HALLADAY: That is objected to as a double question.

MR. DODDS: All right. I will rephrase it.

BY MR. DODDS:

Q Did you at the time review your documents relating to your computing machine?

A I did not, and I will add one item of information if permitted as to the situation I was then in.

Q You may, if you will?

A At the time of Mr. Etienne's visit, I remember that I told him that I was in dire straits as to my -- the use of my personal time. I had the Ordnance Engineering Corporation on my hands, and I had invested in the Ordnance Engineering Corporation all of the wealth I then possessed and it was a matter of principle concerns me how that organization progressed.

I explained this to Mr. Etienne. I said it would be hard and it will take me some time before I am able to transmit such information. That was the basis on which the subject was left. This was more or less a courtesy letter in regard to that visit. When I received no further visits and no further communications from Mr. Etienne, I gathered that he had no further interest.

Q Did you in fact send any documents to Mr. Etienne or to any other representative of IBM on or about this period in 1954 or later?

A I did not.

Q I notice the third paragraph of this letter in question, Exhibit 530, refers to the documents directly in point with regard to the regenerative condenser feature, you see that language?

A I see that. Yes.

Q Do you know whether or not this regenerative feature had any relation to the 827 patent?

A At that moment I had no knowledge, no such knowledge.

Q You know that now?

A I, of course, know that now because, well --

Q I would like you to tell me just in a little more detail what Mr. Etienne told you during this visit?

A He told me that he had been in communication with Clifford Berry. He stated that he felt that the development work with which I had been concerned at Iowa State College

had relevance to the patent situation. He stated that I had certain elements in that work which were then of current interest in computing machines. These subject matter I will try to recall. One of them I remember was the regenerative memory, one is the base two, use of the base two number system; one was sequential calculation, and now I hesitate because I don't remember.

Q Do you recall anything else that Mr. Etienne told you?

A I do not believe that I can recall without a leading question. I seem not to recall anything else.

Q Did you have any correspondence, any discussion or correspondence with Mr. Etienne or any representative of IBM after his visit to you and prior to this letter of June 21, 1954?

A I did not.

Q Did Mr. Etienne indicate to you at that time the character of the defense which they proposed, which IBM proposed to interpose to the Eckert and Mauchly patents?

A Well, I am uncertain as to the question, as to the meaning of the question. As far as I am concerned --

Q Well, let me ask you --

A -- I will --

Q I can be more specific.

A Good.

Q Did he suggest during this meeting that your work on your computing machine at Iowa State College might represent a prior invention of someone other than Eckert and Mauchly that would invalidate the Eckert and Mauchly patents?

A Words of this general character were passed.

Q Did he say anything to you about whether or not your work at the Iowa State College, on your computing machine, might have represented a -- cancel represented-- might have constituted you a joint inventor of any patents which might issue on the Eckert and Mauchly patent applications?

A He made no such representations.

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Q Will you refer to your folder B-6 and documents numbered 58 to 60.

MR. HALLADAY: D for Dog or B for bravo?

MR. DODDS: B for boy.

MR. HALLADAY: Thank you.

BY MR. DODDS:

Q Before we come to that, just one other question. Did Mr. Etienne suggest to you as one of the possible defenses to the Eckert and Mauchly, the patents issuing on the Eckert and Mauchly applications or the Eckert and Mauchly patents which may have issued, the question of fraud on the patent office in the procurement of those patents, or patent applications?

A Well, fraud in the patent office is a technical word.

Q Just a minute. Did he discuss with you as a possible defense, either in those words or in other words of the same import, same or similar import?

A I would say that there were such implications in his remarks. That's my best memory.

Q Now, referring to the folder before you and to documents 58, 59 and 60, a letter from yourself to Miss Dawn Henry which you have previously identified, and in the

paragraph commencing at the bottom of page two, if you will read that.

A I will.

Q Have you read that?

A I have.

Q You indicated at that time, I believe this indicates, in the following paragraph that you did not support an effort in this direction, and "in this direction" I see by referring back to the preceding paragraph, "If your records are good enough we (IBM) will break the Mauchly-Eckert patents."

I gather from that that you then were not interested in breaking the Eckert-Mauchly patents, is that correct?

A Will you give me the paragraph to which you referred again?

Q I am referring to the paragraph beginning at the bottom of page two, and the first sentence of the succeeding paragraph.

A Yes. I have read it now.

MR. DODDS: Would you repeat the question, Mr. Reporter?

(The question was read.)

THE WITNESS: I am trying to think of my attitude at the time. I refer to the remarks (b) and (c) in the next paragraph of that letter as a partial

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answer to my state of mind.

BY MR. DODDS:

Q Well, let me put it simply. Do you believe that the statements in the first full paragraph on page three of this letter, Exhibit 58-60, by reference to the immediately preceding paragraph correctly expressed your then state of mind?

A Will you give me the exact reference which you state and wish me to verify represented my then state of mind?

Q As I understand it --

A Will you read it to me? Just read it to me and I will answer if I can.

Q All right. Do you want me to reread both of these paragraphs?

A Well, just tell me which paragraphs, because I am a little --

Q It's paragraph beginning at the bottom of page two.

A Right.

Q Which describes the letter and visit from Mr. Etienne. Then the first full paragraph on page three indicates what I interpret as your attitude to the request of Mr. Etienne, and I just ask, does that first full paragraph on page three correctly express your state of mind as of the time of Mr. Etienne's visit in 1954?

A All right. Let me think carefully, now that I understand your question. My then state of mind included (a), (b) and (c). It also included another matter which concerned me. I had only gotten the very vaguest statement from International Business Machines Company as to what they wanted to do. I knew that if they intended to make such an effort, I would receive a more direct statement from them. I did not receive such a direct statement from them. If you take (a), (b) and (c) and my remarks as of the present moment, they express my then state of mind.

Q Thank you. I gather that at the present time you are interested in breaking the Eckert-Mauchly patents, is that correct? I am using the language quoting from Mr. Etienne's letter.

A That has technical implications. I have some interests in that general area but whether they are correctly expressed by your remark, I cannot tell.

Q All right. Well then, will you tell me just what are your interests at the present time with respect to the Eckert and Mauchly patents?

A My interests are expressed legally, I believe, and they are a matter of record.

Q Well, I'd like to have it on this record. I believe there is nothing in this record as to what your interests are or may be.

A I have assigned certain rights which I contemplate that I have in this matter to Iowa State University, and Iowa State University has taken certain legal steps regarding the same.

Q We will come to that a little later. Is that the extent of your interests with respect to the Eckert and Mauchly patents at present as indicated by the legal action taken in the case of Sperry-Rand versus Control Data, Civil Action 15823?

A You are asking -- Are you asking me what legal action I contemplate?

Q No. I asked you if you have any interest other than that expressed in the legal action which has been taken?

A Well, I have other interests, yes.

Q What are those other interests?

A The other interest is that the truth in regard to these matters be known.

Q And is that the only other interest?

A I am not sure. I may have within my mind other interests. I am not exactly and overtly aware of those other interests at the present moment. I will be glad to express them if you will give me time to reflect my entire feeling in the matter. I did not expect a question of exactly this tenor and am unable to formulate it simply in the form that you require.

Q Let me ask you a simple question. Do you have any interest in securing a judicial holding of the invalidity of the Eckert and Mauchly patents involved in this case or in the Control Data case?

A I request permission to discuss this question with counsel before answering.

MR. FALLON: For the record, Mr. Dodds, I was about to inquire of you what you mean by interest. Legally speaking, we are talking ordinarily about a financial interest. I think the record has been made clear that Dr. Atanasoff has been retained by Minneapolis Honeywell. Now, that was right at the very beginning of this deposition. If that's the kind of thing that you are going to go into or you want an expression on, certainly he is free to give it, but interests, to my way of thinking, is ambiguous and unless you redefine your terms, I don't think the witness can answer it.

BY MR. DODDS:

Q All right. I will rephrase my question. Is it your purpose to attempt to obtain a judicial holding of the invalidity of the Eckert and Mauchly patents involved in this action or in the Control Data action?

A It is my present purpose that in one way or another the present patent holdings by Sperry-Rand derived from

Eckert and Mauchly will come apart at the seams and be held, and these rights will come to be held in a different way than they are now held.

Q What do you mean by coming apart at the seams? you mean to be held invalid or unenforceable?

A I didn't say that and I didn't mean that --

Q I am asking you --

A I didn't mean that, sir. I meant that the exact holdings of parties thereto will be different in the future than they are in the past.

Q And I come again to the question, is it your purpose or objective or view that this coming apart at the seams will include a holding of the invalidity of these patents in question?

A I request permission to discuss this exact question with counsel, because I do not understand it.

Q Well, what don't you understand about it, Dr. Atanasoff? It seems to me the question is very simple. The question is, are you seeking directly or indirectly in this action or in the Control Data action to have the Eckert and Mauchly patents declared invalid?

MR. FALLON: I think the question is improper because Dr. Atanasoff is not seeking anything. He is not a party to the action. The question

involves a legal consideration talking about invalidity. It assumes there has been some discussions, decisions or something like that. I think he can answer the question if he chooses, but I don't thinkthe question is going to yield any worthwhile facts for this litigation.

MR. DODDS: Mr. Fallon, are you instructing the witness not to answer the question?

MR. FALLON: I am not instructing him not to answer. He has said before, and this is our position, that the important thing he wants to get out is the truth of the matter and let the chips fall where they may. That's my expression, but he said --

MR. DODDS: I'm not asking you, Mr. Fallon. I am asking Dr. Atanasoff what his views are.

MR. FALLON: All right.

BY MR. DODDS:

Q Will you please answer the question, Dr. Atanasoff?

A If you will repeat the question, please.

MR. DODDS: Mr. Reporter, would you repeat the question?

(The question was read.)

THE WITNESS: I have no action before any court in regard to this matter.

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BY MR. DODDS:

Q That is not a responsive answer. Will you please answer the question?

A Do you wish to know what my desires in the matter are?

Q Yes.

A What my desires are? If I tell you what my desires are, will this suffice?

Q Yes.

A I desire that there be a rearrangement of the manner in which the patent rights which at the moment bear the rights, bear the name of Mauchly and Eckert are held.

Q That is not responsive, Dr. Atanasoff. I asked you what your --

A That is my desire.

Q That is not responsive to the question. What are your desires with respect to the holding of the validity or invalidity of the Eckert and Mauchly patents involved in this action and in the Control Data action?

MR. FALLON: I think the witness is entitled to counsel on this matter, because to my way of thinking, the use of the terms validity and invalidity are legal expressions, and he is entitled to the benefit of my counsel relative to the meanings of these terms, so with that thought --

MR. DODDS: In that case, I would suggest we defer this question and we will come back to it, and we can go on. You can consider it at the lunch hour --

MR. FALLON: Fine.

MR. DODDS: And what I am interested in is the validity or the "breaking of the Eckert and Mauchly patents" as used in Mr. Etienne's letter -- in Dr. Atanasoff's letter to Miss Dawn. Now, he had something in mind.

THE WITNESS: You know, my words there, I was quoting International Business Machines, Mr. Etienne, I was not quoting any expression of myself. I was merely reporting --

BY MR. DODDS:

Q Yes, that's right, but apparently you understood it because then you expressed your views with respect to it. And what I want to know is your views now with respect to that same suggestion.

A I still eschew litigation. That does not make you happy. I still do not like living in the past, but that does not make you happy. I do not have my hands as full as I did then.

Q These are the reasons why you did not propose to

participate in breaking the Eckert and Mauchly patents in 1954?

A Right.

Q My question is, are you, at the present are you interested in, is it your objective, is it your purpose or is it your desire to break the Eckert and Mauchly patents as that term is used?

A Will you define the word "break"?

Q I am using it in the same sense that it was used in Mr. Etienne's letter to you which apparently you understood because you gave your reasons for not complying with his request to break the patents.

A Mr. Dodds, I submit that at the time I was speaking open language. I am now before a Court of law and I will know the legal meaning of the words which I use now or I will not use them, and I do not know the legal meaning of the word "break."

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Q I indicated you may discuss this with your counsel. I was just clarifying what I had in mind as to the sort of answer I wanted. So then we will just go on to the next subject.

MR. DODDS: Since we are changing subjects, perhaps this is a good time to adjourn for lunch, shall we? What time would you care to return?

MR. HALLADAY: Would 1:30 be agreeable to all?

MR. DODDS: Yes.

(Whereupon a recess was taken until 1:30 o'clock P.M., December 4, 1968.)

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December 4, 1968,
1:30 o'clock P.M.

(Appearance as heretofore noted.)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

CROSS-EXAMINATION (CONTINUED)

MR. HALLADAY: I guess we are on the record.

MR. FALLON: Mr. Dodds, we want to thank you for the opportunity of discussing your question over the noon hour, and I think that Dr. Atanasoff is now in a position to tell you of his desires in this litigation.

MR. HALLADAY: May it be stated for the record that that discussion was one in which counsel for Honeywell did not participate in any way.

MR. FALLON: Absolutely correct.

MR. DODDS: All right.

MR. FALLON: J.V.?

THE WITNESS: I have had a chance for reflection and counsel, and I must now phrase my legal language -- my legal activities into common language for you. My first desire -- I have several desires -- the first desire is as follows: That this

patent be held valid, but that I be called a co-inventor thereof.

My second desire is in case this fails, that this patent be declared invalid, and overall, I have the desire that the facts thereof become known.

BY MR. DODDS:

Q Thank you, Doctor. About when did you arrive at the formulation of your desires which you have just expressed?

A Is this with special relevance to the first desire?

Q If different desires came at different times then I would like the time of each?

A Well, that's pretty easy. Until roughly a year and a half ago, let's see, a year ago last May, to be more specific, the matter was far from my mind, and there were no desires relative to the matter therein. At that time it was brought to my attention, some of the facts hereof, were brought to my attention, first by counsel for Control Data and afterwards by counsel for other firms in the United States. As a consequence of this information, of the information I was given at this time, I came to realize that I had desires.

At first my -- the desire that I stated first did not exist because I, my concept was that it had no legal, no possibility of legal fruition, and I was associated

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with respected and learned counsel of many corporations. As a result of this association, gradually there evolved in my mind a feeling that there might be -- that my first desire might possibly come to fruition, and I commenced to formulate it in my mind. That perhaps gives a summary of my position.

Q And when did you formulate the desire that in the event the first desire should not be fulfilled, that you would like then to see the Eckert and Mauchly patents declared invalid?

A About a year ago.

Q You mentioned that you, that counsel, I believe for Honeywell and counsel for other firms, had called to your attention certain facts. Counsel for what other firms, Doctor?

A Counsel for Control Data, counsel for Honeywell, and in those initial days particularly counsel for General Electric.

Q And what facts did they call to your attention which led you to formulate that desire?

A Well, what they did was to sit down with me and read me the respective patents.

Q They certainly --

A The claims in the respective patents.

Q And they certainly said more than that, than just read you the claims, what else did they tell you?

A Not much else. I mean as far as I am concerned, as far as relevance to the question you asked, not much else,

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no.

Q You mean the only facts that they related to you which enabled you to formulate this desire to be declared a joint inventor was the reading of claims of certain of the patents?

A Oh, now -- now, that -- that was initial information on the case.

Q Yes.

A Then as a consequence, you know, here I am associated with all this learned counsel, Mr. Dodds, and you know they are picking my mind. Now, they are picking my mind to beat the band, and there is no question about it; but, Mr. Dodds, to a much lesser degree, but inevitably I am picking their minds.

Q And so what did you pick from their minds? What facts did you pick from their minds?

A Well, I had a very learned discussion by a learned member of a legal counsel involved in this case on the subject of -- you know, I hate to quote legal terms, but misjoinder and nonjoinder. I don't know much about what these words mean, although I have read the patent code on the subject.

I took pains as a consequence of this exposition by learned counsel to read the code and to study it and to study -- to commence to pick up information.

Q Was that Mr. Allegretti or Mr. Halladay?

A It was neither one.

Q You said counsel for this corporation, as I

understand it?

A I said counsel in this case. I said counsel in this case.

Q What other counsel are there in this case?

A I am speaking of counsel for the defense in this case.

Q Well, I am counsel for the defense.

A You are the man.

Q And what facts did I give you that led you to believe that there might be a misjoinder or nonjoinder of inventors?

A Well, you were sitting at my luncheon table, and I suppose you had come to my place to visit with me and you had brought Dr. Mauchly with you or he brought you, I am not quite sure what happened on that occasion, and it is exactly what happened, I am sorry to tell you, and you can pursue the matter but we will go into details as I can, but if you insist --

Q I would like you to go into details, yes, just what I did tell you at that time that gave you this idea?

A Well, it never occurred to me until that luncheon.

Q What did I tell you?

A You gave me a nice exposition of the power of correction of the named patentees of an invention. Do you remember that occasion? Pardon me. I am not supposed to ask you questions. Strike.

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Q I do remember a discussion on questions of patent law. I don't actually recall a discussion on that particular point, but it could well have been.

A It happened, sir.

Q You mentioned you had consulted with counsel of many corporations. You mentioned Honeywell and Control Data and General Electric, were there any others?

A I believe not. I believe that was a mis-statement, I used the term falsely or erroneously there.

Q Now, coming back to the visit of Mr. Etienne, and you testified, I believe that he raised an implication of fraud?

A Who? Who?

Q Mr. Etienne?

A Mr. Etienne, yes.

Q Do you remember what the substance of his conversation was?

A Well, you know, I wish I could just pull out of my memory his exact words. I am sorry, but I cannot. But I have the impression as to what went on at that time and with the understanding it's an impression and a memory of substance but not of words, why I will attempt to give you that information.

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Q If you would, please.

A Mr. Etienne suggested that there might be occasions on which the statements contained in the preamble of the patents issued to Eckert and Mauchly were not exactly true.

Q Anything further?

A That's the substance of it. I can't think how to create the impression more exactly in your mind.

Q Did he give any impression that those allegedly untrue statements were made knowingly and deliberately and knowing them to be false or untrue?

A I gathered that was his intent. I again am speaking of it as a matter of substance, not of words.

Q Now, if he made that statement, it must have been with respect to the 827 patent, was it not?

A I have no such memory.

Q Well, you know, do you not, that the ENIAC patent had not issued as of the time of Mr. Etienne's visit?

A I know that now, yes.

Q Well, at the time of his visit, did you get any intimation as to which one or ones of the Eckert and Mauchly patents or patent applications Mr. Etienne had reference?

A Mr. Etienne, you know -- I should state that I didn't really know how to take Mr. Etienne completely. He came to me with these proposals as I have stated. Now, I did not -- I believe he did not name the patents, but if he did name them,

I have no memory thereof. I am, as a matter of present information, I am informed that he had been in an interference relative -- that he had been engaged in an interference proceeding with respect to other patents than the one at that time, and, of course, he had talked to Clifford Berry, and this is the total of my knowledge of his knowledge.

Q Well, since his visit was in 1954 and he made reference to a statement in the preamble of the patent, he must have referred, must he not, to the 827 patent which had issued in 1953?

MR. HALLADAY: Objected to as argumentative.

BY MR. DODDS:

Q You may answer.

A Well, if you can see that, I can't. I don't draw that deduction in my own mind, so I cannot say yes.

Q You have no recollection whatever as to which if any of the Eckert and Mauchly patents or patent applications Mr. Etienne was referring when he raised the implication of fraud?

A I am sorry I used the word fraud, because it carries such a violent connotation, but I did use it and I used it with that in mind, perhaps not in a strictly correct legal sense, but this was the impression he gave me and I have used the word and I will stand by it. Now, I have so previously

that I have no knowledge as to which of those patents or whether he was talking about all of them. I do not know.

Q Do you recall what statements, and I am speaking now of what substance of the statements he indicated were in his opinion untrue?

A Well, I gained it was the oath in regard to originality of invention.

Q An oath --

A Yes, an oath regarding the originality of invention, but I got that impression. Whether he told me that or whether that was just my own derivation from what he told me, I don't know.

Q You stated, I believe, that Mr. Etienne had suggested that the work which you did on your computer at Iowa State College may have constituted you a prior inventor, is that correct? I think that was your testimony this morning. I don't have the transcript.

A I believe that's the words that are properly applied to that situation.

Q And do you recall of what part or feature of the computer he applied that language to?

A You understand, I should point out to you that my discussion with Etienne was of a peculiar type. It was, in the first place, only of an hour duration, and during an hour after you get introduced and get through with the

pleasantries, there isn't too much time left. We went into no legal aspects, and if we had gone into legal aspects, I would not have understood them, probably. There was no legal argumentation used at that time. He recounted the list which I employed in writing the Henry letter, and I remembered those from that occasion. Beyond that, I cannot go.

Q Well,do you have any recollection as to what he thought you were the prior inventor of?

A Well, I will read you the list from the Dawn Henry letter, magnetic memory, regenerative memory, the advantages of the binary number system in electronic computing, sequential processing, and so forth.

Now, I racked my memory at that time and that is the best I have.

MR. HALLADAY: Is that from page 3 of 58, 59 and 60?

THE WITNESS: Yes, it's at the top of page 3, number 60.

BY MR. DODDS:

Q And do you believe that you are, in fact, the originator of these features of the computer which you have enumerated at the top of page 3 of your letter to Miss Henry, Exhibit 58-60?

A Well, now, I will qualify the first one. When I say

magnetic memory, I do not mean magnetic core memory. I mean magnetic drum memory, and I am not speaking of the term inventor in any legal sense. I am speaking about, I am speaking only in terms and I wish to speak only in terms and can only answer in terms of the common usage of the term, namely, that I came across these ideas independently and it's the object of the Courts of the United States to decide who is the true and original inventor, and I cannot attempt to influence that decision.

Now, as in regard to these, in my original conception of these, the answer is yes.

Q Now, if we may turn to another subject. A quantity of internal correspondence among personnel of IBM was made available to counsel for plaintiff and counsel for defendant in this action. I'd like you to just look at these initially and ask you whether you have ever seen them before. The first is a letter or memorandum dated February 12, 1940, from Shoemaker to Packard.

MR. HALLADAY: Will you spell those for us, please, Mr. Dodds?

MR. DODDS: S-h-o-e-m-a-k-e-r; Packard, P-a-c-k-a-r-d.

THE WITNESS: In regard to this letter --

MR. FALLON: What was the question?

BY MR. DODDS:

Q The question is, have you ever seen it before?

A I did not see it anywheres near the date hereof. I may have seen it since that day. I remember having seen one or two letters in the hands of counsel,and which counsel I do not know. I am sorry, I just don't happen to remember along this general line.

Q Was it since the commencement of this lawsuit?

A What?

Q Was it since the commencement of this lawsuit?

A It was. If I saw it, it's since the commencement of this lawsuit.

Q Well, perhaps to save time, there are a group of these documents which I will just identify for the record, and if you will just look through them collectively, the same question, have you ever seen them before, and I mean before, before the commencement of this lawsuit?

A Right. All right.

Q The next is a memorandum from Ehret to Willson, dated February 20, 1940.

MR. HALLADAY: E-h-r-e-t?

MR. DODDS: E-h-r-e-t, yes.

THE WITNESS: I knew Mr. Ehret at the time. I have not seen this letter.

BY MR. DODDS:

Q Either before or after the commencement of this suit?

A Before the commencement of this suit and since the commencement of this suit, I'd say I saw two or three letters involving Ehret, and maybe the man out yonder. I have some letters in my files from Ehret, and, of course, I saw all of those, but I don't believe this came from my file.

Q You do not recognize it?

A I do not remember seeing this document.

Q The next is a memorandum dated February 26, 1940, from Willson to Ehret, the same question.

A The answer is no.

Q To both before or after the commencement of this suit, to the best of your recollection?

A I saw two or three letters since that time, and it may have been one of them. If it was, it concerned me little and I formed no register of this fact.

Q The next is a letter dated March 6, 1940, from Ehret to Packard.

MR. HALLADAY: What was the date?

THE REPORTER: March 6, 1940.

THE WITNESS: I did not see this letter at the time. I believe I have seen it since the inception of this suit.

BY MR. DODDS:

Q The next is a letter dated March 6, 1940, from Ehret to a name which I cannot decipher, D D something, manager.

A I have seen this since the inception of this suit.

Q But not before?

A But not before.

Q The next is a memorandum dated March 6, 1940, from Ehret to Armstrong.

MR. HALLADAY: What is the question?

THE WITNESS: Have I seen it --

BY MR. DODDS:

Q Have you seen it --

A -- before, I have not seen it before the inception of this suit. I am uncertain as to my having seen it since the inception of this suit.

Q Lastly, is a memorandum with the date which is rather illegible in the lower left-hand corner of page 1 and a signature, a typed conclusion which is also illegible, and it starts out, "Professor J. V. Atanasoff called on Tuesday, April 30th."

I ask the same question.

MR. HALLADAY: The date was illegible, if I understood him, but he did quote something about Tuesday, April 30th.

MR. DODDS: What year, I don't know.

THE WITNESS: I am having a little trouble.

MR. HALLADAY: He didn't say from whom to whom.

MR. DODDS: I don't know.

MR. HALLADAY: If he did, I didn't hear it. The question is, has he ever seen this document before?

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MR. DODDS: Same question.

THE WITNESS: I have not seen this document to the best of my knowledge and belief.

BY MR. DODDS:

Q Now, in these documents, I will give them to you if you wish, there is a reference to a Mr. Manieri, a student engineer in the IBM Des Moines office that made a visit to you at Ames, Iowa. Do you recall any such visit?

A Yes, very vaguely, but I recall such a visit and the name seems familiar in my memory.

Q Can you tell me what happened at that visit?

A My rather vague memory of this occasion is that the man visited me and wanted to see the computing machine; that Mr. Berry showed him the computing machine and let him take a look at it and admire the great array of vacuum tubes and other appurtenances thereto and then he went away.

Q Do you know whether or not Mr. Manieri was shown the operation of the computing machine?

A To the best of my knowledge and belief not, and he certainly was given no details of the machine. That was our current policy and I seem to remember that and recall Mr. Manieri.

Q Do you know whether or not he saw a copy of the, "Manuscript"?

A He did not. He did not.

Q Would you refer to your folder D-2, Exhibit 308.

MR. DODDS: Excuse me, off the record.

(Discussion off the record.)

BY MR. DODDS:

Q I believe this is a copy of, a carbon copy of a letter which you have previously identified.

A All right.

Q In the second paragraph you refer to, you make the statement, "My present development does pertain to my previous ideas but goes much further," and this is as of April 6, 1940. To what previous ideas were you referring at that time?

A To my previous attempts which I believe I must have informed Mr. Ehret, but at any rate what I was referring to, previous attempts to use IBM tabulators for the solution of simultaneous linear equations, solution of simultaneous linear equations. There are some items in the files here relative to that subject.

Q Did it include also the, what you have termed the prototype of your computing machine?

A Not at all.

Q This same sentence says that your present development goes much further. Now, what were you referring to by that statement of going much further?

A The developments which I have been testifying about

concerning which I have been testifying here and that was my interpretation of their relations to the previous efforts.

Q Would you refer to your folder B-12 and Exhibit 104. And if you will refer to the paragraph beginning at the bottom of the first page, if you will read that paragraph it refers to a direct approach by patent counsel of IBM?

A Yes.

Q Is this approach the same as the visit by Mr. Etienne about which you previously testified?

A This is the only such visit that occurred and it was concerning the same one.

Q And you will notice that this paragraph refers to the proposal of IBM to bring suit to invalidate the Mauchly and Eckert patents, do you see that language?

A I do.

Q And that therefore must have referred to a proposal made by Mr. Etienne during his visit to you in 1954?

A Yes. He used words, perhaps he said break, perhaps he said invalidate. I don't know what word he used, but this is what I thought was the substance of his remarks, and I believe that was the substance of his remarks, and I believe that was the subject of his visit as we have recalled.

Q You will notice the same paragraph refers to the basis for the proposal to invalidate the patents was, "On the ground that their oath of originality was false," that is in

accordance, I believe, with your previous testimony, was it not?

A It is in accordance with my previous testimony as I understand it.

Q Dr. Atanasoff, would you tell us, relate any and all contacts you have had with IBM or any representative of IBM after Mr. Etienne's visit in 1954?

MR. FALLON: Clarification here, Mr. Dodds. I believe the witness has been interpreting these in the context of computing machines rather than some business he may have had as vice-president of Aero Jet General and buying equipment.

MR. DODDS: That may be understood. Yes. Thank you.

THE WITNESS: Will you repeat your question, please, Mr. Dodds, so I could be sure I can answer it quite concisely?

BY MR. DODDS:

Q Yes. Will you relate any and all contacts by way of conference, discussions or otherwise with IBM or any of its representatives relating to computers following the visit of Mr. Etienne in 1954?

A I believe there are none.

Q I believe you testified that you have beeen employed

as a consultant or some similar capacity by counsel for Honeywell in this case, is that correct?

A I have so testified.

Q And will you describe the circumstances under which that employment was initiated?

A I was entertaining three members of the patent counsel relative to the field of computing machines from General Electric Company at my home. They expressed to me that counsel for Honeywell would have a desire to have relations with me. I raised the question -- I asked the following question: Should I contact them? They said no, we will contact them. They evidently did because subsequently the counsel of Honeywell contacted me by telephone, I believe.

Q When was this discussion you had with the counsel for General Electric Company, approximately?

A Oh, well, it wasn't last summer, it was the summer before, the summer before last. During the summer probably in June or July of, let's see this summer, the past summer is '68 -- '67, summer of '67.

Q Could it have been 1966?

A Goodness knows. Let's see. I haven't gone that far wrong. I returned from Mexico and then I was contacted and then that -- now, let's see, that was not this past summer unless my memory is playing a peculiar kind of trick

on me it could not have. If you desire I can give you the exact date by referring to files but I don't think so. I am sure it was '67, practically speaking. Let's see now, '67, we just passed the summer of '68 -- no, it was in the summer of '67. It was in the summer of '67, Mr. Dodds.

Q Well, I think you testified that you had been working on this assignment from Honeywell for 17 or 18 months?

A Yes. Well, all right.

Q That would have been prior to the summer of '67, would it not?

A Would it? Let's see, that is 16 months anyway I've been working on it with them. I didn't mean this was a precise estimate, and it was, I came into relation with them towards the end of the summer and we are now at December. We are now in December. I think that's reasonable cooperation.

Q Do you know whether or not this lawsuit had been initiated at the time that you were retained as a consultant?

A I am sure it had.

Q Now, what time period does this employment cover, is it for an indefinite period or a definite period, and if so, what?

A Indefinite. Indefinite.

Q And when did the employment actually start, work under the consultant retainership?

A I will have to do reference work. I don't have the

date in mind.

Q What is your closest approximation of the date?

A Oh, it would be some time in the fall of '67.

Q And just what are the nature of your duties as a consultant to Honeywell?

A Well, I can give my conception, I could attempt to enumerate some of the terms of the contract. I could tell you that I am supposed to assist them in determining the facts of the history of computing machines as I know it, that I should assist them in interpreting these histories for the purposes of the suit with knowledge which I possess of the computing machine which I developed, that's a rough discussion of the duties.

Q Is this arrangement you have with Honeywell oral or written?

A It is written.

Q May we see a copy of the agreement?

A I do not have one in my possession. I imagine some arrangement can be made to get you a copy. I don't have one.

MR. DODDS: Can arrangements be made to see a copy of the agreement?

MR. HALLADAY: They may.

MR. DODDS: Thank you.

BY MR. DODDS:

Q Prior to entering into this agreement, I assume there

were some preliminary discussions with respect to it, is that correct?

A There were.

Q And with whom were those discussions?

A They were with Mr. Hanson, Mr. Dmitri Allegretti and Mr. Halladay.

Q And what --

A And Mr. Call.

Q And is that all?

A I believe that's the complete list.

Q What was the substance of those discussions?

A We discussed the history of computing machines as of that date and what work I had done. We read the Henry letter and that represents a general tenor of the discussions as far as I can remember it.

Q Well, I assume the discussions also included with the nature of the work which you would be expected to do?

A Yes. And this nature of the work was, as far as I am aware, as far as I am aware, was right in line with the nature, the nature of the work which I formerly expressed to you.

Q Dr. Atanasoff, I notice that when we first attended a previous session of these depositions you seemed to have quite a familiarity with this office. I assume you have

spent a considerable amount of time here?

A You mean I knew where the hearing was going to be, was that it?

Q You seemed to know quite a few things.

A Well, I hadn't been here so much, to tell you the truth, that isn't quite right. I did know that much though. I spent, well --

Q How many visits, more than five?

MR. HALLADAY: Talking about this particular conference room or my legal offices?

MR. DODDS: Your legal offices.

THE WITNESS: Oh, here, I imagine two or three.

BY MR. DODDS:

Q The period since you started to work?

A Yes.

Q And how much time would be occupied, a day, two days, a week?

A Oh, goodness, you mean here in these offices?

Q Yes.

A In these offices why a week on a couple of occasions would probably express a reasonable -- a reasonable scope.

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Q And did you spend a week or a portion of the week in these offices preceding the first session of your deposition?

A That is one week that I spent here. Now, I am trying hard to think, and I don't believe I spent any other week here, to be exact.

Q And with whom did you confer during these meetings here in these offices?

A Well, when I was at these offices I conferred with Mr. Dmitri Allegretti, with Mr. Call, with Mr. Halladay.

Q Is that all?

A Oh, Mr. Jim Halverson, and sometimes, and on previous occasions with other partners in the firm and other people here.

Q Now, let's consider also the question of conferences in any of the offices of Bair, Freeman and Molinare in Chicago. How many conferences, approximately, have you had in those offices?

A Oh, a great many more.

Q More than ten?

A More than what?

Q More than ten?

A Oh, I would think it may have well been ten or twelve conferences in those offices. This is an offhand estimate without examination of travel records.

Q We are not going to hold you to it exactly.

A You understand I am trying to give you a reasonable

impression of the situation.

Q And with respect to the time which you spent there, was that for durations of a day or several days or a week or more?

A Let's say several days usually.

Q And who were present at those conferences?

A Well, Mr. Dmitri Allegretti, Mr. Call were the principal parties, or on occasions I met with other members of that firm, and I can't recall the names at the moment.

Q What was the general nature of the subject matter discussed?

A Who did what, when?

Q And what were you assigned to do?

A What?

Q What were you assigned to do?

A I was assisting with the discussions of who did what, where and when.

Q To what extent?

A And what interpretation can you give this document and what can we find out from that man, and so forth. It's just the whole basic work of the whole thing.

Q Were there other technical personnel present at these conferences?

A I believe at the conferences that there were not, and --

Q I am sorry.

A I guess the answer stands. I guess there were not. I can't be a hundred percent sure, but that is my immediate memory.

Q Coming back, then, what was the what, where and when as it affected you?

A Oh, you see, what we were investigating is who did what, when and where in this line of the computing development, and we discussed Berry's history. We discussed the entire work of the machine. We went over documents unbelievably frequently, the entire documentations which are in your hands, and I don't know how you can do it, but we went over it so many times, and I must say that on each occasion something new has been derived from those documents.

Q Perhaps I misunderstood you. When you said the what, where and when, you were referring to the past tense rather than the future tense?

A I was, yes.

Q All right. The conferences that you have had in these offices, did each of them, was each of them attended by Mr. Hanson?

A Oh, no.

Q Well, how many would you say were attended by him?

A Oh, three or four total.

Q Did he attend the first conference here?

A I don't think so. He attended a conference at my home at one time. Thatmight have been called the first one. That's the only reason I interpose that statement, but if you don't call that the first one, why, then, he did not attend the first one.

Q And how many conferences have you had in your home with representatives of Mr. Halladay's firm or Mr. Allegretti's firm?

A Oh, perhaps ten, fifteen.

Q And of what duration were they? Were they a day, two days, a week or what?

A Oh, a matter of, I would say an average of a couple of days, perhaps.

Q Have you had conferences at which representatives of any firms other than Honeywell were present?

MR. FALLON: In what regard?

MR. HALLADAY: You mean at which Honeywell was also there?

MR. DODDS: Yes.

BY MR. DODDS:

Q I am speaking of these conferences which you have had with representatives of Honeywell. At any of these conferences, have counsel representing other concerns been present?

A I don't remember any.

Q Are you reasonably sure of that, Doctor?

A Well, if you would name another firm I would immediately be able to answer you with certainty, and I just can't -- there are a lot of people around, you know, all the time, and to answer in general as to whether any possibility of any other firm and then be held to it, I am having a little difficulty, but I am pretty sure, I am endeavoring to assist counsel in his inquiries.

Q I understand. Well, you mentioned two other firms, particularly Control Data and General Electric. Were counsel in attendance representing either of those firms?

A I have attended conferences -- good, that is helpful. I have attended conferences which combined the counsel of Control Data and Honeywell.

Q More than one?

A Yes.

Q Three or four or five?

A Five, ten.

Q And where were those conferences held, in these offices or Mr. Allegretti's office or in your home or all three places?

A All three places -- well, I believe in all three places.

MR. HALLADAY: Was your answer "combined counsel of Control Data and Honeywell"?

THE WITNESS: Well, it was a careless

answer, and thanks for calling me on it.

May I restate my answer to that question?

BY MR. DODDS:

Q Yes.

A I have attended conferences in which there were representatives from Honeywell and Control Data simultaneously.

Q That is what you meant by your preceding --

A That is what I intended to say.

Q -- by your preceding answer. And did these conferences deal with the preparatory work which you are doing to which you previously testified in connection with this case?

A Without a specific memory, it would be my impression that they did.

Q Now, you testified, I believe, that you had separated your files into these folders and numbered them sequentially. I believe the language was, in accordance with their relevance to this case, or some such language, is that correct?

A (Witness nods his head affirmatively.)

Q When did you first learn about "this case"?

A I first learned about this case in May of 1967.

Q Was this upon the occasion of the visit from representatives of General Electric Company?

A It was not.

Q Well, what were the circumstances under which you first learned about this case?

A I learned about it from a representative of Control Data -- I mean, counsel for Control Data.

Q Was that at a conference that you had at the office of Control Data or was it at your home?

A It was at my home.

Q A visit arranged by counsel for Control Data?

A It was so arranged.

Q Was that Mr. Kirkpatrick?

A It was.

Q Now, you testified about the preparatory work which you had done in connection with this case during the last, I think you said seventeen or eighteen months. Who initiated that preparatory work?

MR. FALLON: Do you understand the question?

THE WITNESS: Well, I don't know, I think I understand the words of the question but the doubletalk connected with it I cannot fathom, and so I think it should be rephrased.

MR. FALLON: I say that, Mr. Dodds, because I didn't understand the question.

BY MR. DODDS:

Q You had testified earlier about preparatory work

that you had been doing in this case, including preparation for your deposition here. Now, my question was, who initiated that, who started you on that work?

A Well, counsel and I visited together and --

Q Counsel for Honeywell?

A Counsel for Honeywell on this case, yes; counsel for Honeywell and I visited together, and gradually the work to be done was outlined, and, of course, according to my terms of my contract, this work was outlined by Honeywell. I don't know -- by counsel for Honeywell. I don't know that the work was particularly outlined by Honeywell any more than it was outlined by me. It became perfectly clear and apparent to all of us what had to be done, and, of course, a certain fraction of it naturally fell to me.

Q Just what did Mr. Kirkpatrick tell you about the Control Data case?

A He brought out a copy of 827, and he commenced reading the claims therein.

Q What else did he say? He didn't stop with that, I assume?

A Well, he didn't, but this is the only thing that influenced my decision the least bit is reading those claims and seeing what actually happened in the case.

Q Well, I wasn't interested so much in what interested you as what Mr. Kirkpatrick said.

A Well, I am trying to -- all right. Then what he said was that, "We would like to secure your help in the case."

Q And did you arrange to provide help to counsel for Control Data?

A I did.

Q And is that preparatory work being carried on concurrently with your preparatory work in this case?

A It is. It has been; not always concurrently, you understand, but generally concurrently, yes.

Q Are you being compensated for your time in attending this deposition?

A I believe so, yes.

Q And how about for the time in attendance at your deposition in the Control Data case?

A I believe I was uncompensated for that. It was a very short period and I believe I was uncompensated for that. Oh, I am sorry, Mr. Dodds. May I change my answer to that slightly?

Q Yes.

A I was told by counsel, I was told by you that you would compensate me for that, but you never compensated me.

Q If you will send me a statement, we will compensate you for it.

Did Mr. Kirkpatrick tell you -- will you strike that.

What did Mr. Kirkpatrick tell you about the Control -- about the Honeywell case?

A He said, "Here, did you know this?"

MR. FALLON: Wait. Listen to the question.

BY MR. DODDS:

Q The Honeywell case, this case, what did Mr. Kirkpatrick tell you about this case?

A Oh, I am sorry. I am sorry. I am awfully sorry. Strike my previous answer, please. Let's see if I can formulate an answer. At the time he visited me, he said absolutely nothing about this case. At the time of his first visit, he said absolutely nothing about this case.

Q When was that?

A It was in May of 1967, and I believe he had no knowledge of it. It is my impression that he had no knowledge of it. I am not sure.

Q Then it was at a subsequent visit that he told you about this case?

A Mr. Kirkpatrick didn't tell me about this case.

Q I misunderstood your testimony. I thought you said earlier that you learned about this case from Mr. Kirkpatrick?

A Well, of course, you know, I can't be quite sure, Mr. Dodds, because sometimes I slip, but I don't believe I said that, and I believe said at a meeting with counsel for

General Electric Company, and I hope I said that, and we will look in the record and see if I said that.

Q You did say the fact that you had --

A That is where I learned about this case.

Q I had understood -- all right. The record speaks for itself. Anyway, that is when you first learned about this case?

A Yes.

Q In the organization of your document folders, this sequential numbering of the documents, was that your idea?

A The answer is yes.

Q And when did you get that idea?

A Well, I should have got it the very first day, but I didn't get it until about three months ago.

Q You testified on direct of your very earliest recollections that you had. Would you tell me what were the circumstances under which you were asked to recall that earliest recollection?

A I am embarrassed about this, Mr. Dodds. You know, it contains matters which members of my family regard as personal, but if you insist, you will get it.

MR. FALLON: I don't think you understood his question. He wanted to know the circumstances under which you were asked to recall this. I believe that is

the question.

BY MR. DODDS:

Q That's correct.

A Oh, I am sorry. That has no --

Q No personal --

A Again, I am mishearing. All right. Thank you. Thank you. Well, I can't remember the circumstances very well, but I know who did it, and I know that I was asked in the course -- I don't know about you members of your profession and their common habits, so nothing surprises me, Mr. Dodds, but he took some pains --

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Q Who is he?

A The members of the, more than one, all members of counsel for Honeywell took pains to probe my original -- my original memory and see what I remembered, and it became sort of a game with us and then all of a sudden I realized I did have this earliest memory and I made this statement and I believe on this occasion it was in a discussion with Mr. Halladay.

Q Have you brought with you, Doctor, all of your files relating to the Iowa State College machine or to any subsequent discussion, conferences or communications with respect to it?

MR. FALLON: Now, is there a time limit on that, Mr. Dodds?

MR. DODDS: No time limit on my question.

MR. FALLON: This then would include correspondence between Dr. Atanasoff and me, for example?

MR. DODDS: I just asked him whether he brought it all and then we will come to what if any he didn't bring.

THE WITNESS: I have not brought it all Mr. Dodds.

BY MR. DODDS:

Q All right. Then I would like to ask what was the basis of your screening or elimination of the ones you did not bring?

A I attempted to bring all information in my files pursuant to the subject of my development of computing machines prior to the current -- prior to the current era, that means the era in which the suits were current, prior to the instigation of the current suits.

Q That is prior to May of 1967?

A Well, I am a little vague as to that deadline, but I think that the answer is prior to, yes. I don't have any -- have anything that is not prior to May of -- I believe it is prior to May of 1967, yes.

Q That is you brought?

A Yes.

Q There was one folder marked E-1 which you eliminated?

A Yes.

Q By whom, by whom and why was that folder eliminated?

A You know when I originally -- it was eliminated by me, Mr. Dodds, and it was eliminated because it was -- it represented a misclassification of my files in the beginning and the material which was in there. I thought it was separate. My first glance, when I made up those file folders, I thought

it was different than the material contained in E-2, but I found out it was substantially equivalent and the material from file folder E-1 was added to E-2. So the material is here although the folder is not.

Q To what extent, if any, have you discussed the subject matter of your testimony, say, with Mr. Halladay?

A Well, Mr. Halladay asked me what -- he asked me a great many questions and I have answered them all faithfully even as I would do in court.

Q And going a bit further, what discussion has there been, if any, with respect to what testimony you would give as contrasted to answering Mr. Halladay's questions?

A Are you raising a question as to whether anybody attempted to influence my testimony?

Q No. Not at all, Doctor, just a question to the extent --

A I would answer that if you wish, be glad to answer that, but there has been discussion back and forth. The only discussion that I remember, however, was relative to a pertinent document, for instance, if I said something and there might be a document which contravened it and we have to decide whether the document or my memory was correct, and we would discuss it, and I would review my -- I would use the document to refresh my memory and in this way my memory gradually developed in regard to items of this case.

Q To what extent has your own counsel Mr. Fallon participated in or been familiar with these discussions with Mr. Halladay or his associates?

A Oh, to a limited extent, rather limited.

Q Coming back, Doctor, to your conference, I believe in your home, with representatives of the General Electric Company. Do you recall who was there?

A I will try to recall. Mr. Norman Fulmer. There were a few other gentlemen present.

Q Would one of them be Mr. Eltgroth?

A One was Mr. Eltgroth. Another man was a gentleman from Phoenix, Arizona. I can give you that much of a hint if you can help me.

Q I don't believe I can. You don't recall his name?

A I don't.

Q He was patent counsel, was he?

A He was patent counsel, all patent counsel in the field of computing machines for General Electric Company.

Q And just what did they tell you about this case?

A They had somehow gotten ahold, they told me several things. In the first place Mr. Norman Fulmer told me that he had worked on my computing machine and almost immediately my mind began to encompass this fact. So he knew about it pretty well. And they, the Dawn Henry letter was discussed. I think they had a copy of it somewheres, and I previously

stated to you that they said that there was litigation.

Q With Honeywell?

A With Honeywell, yes.

Q Did they tell you what patent was involved?

A Yes.

Q Did they tell you what defenses were being interposed in the action?

A I have no knowledge of such defenses. No.

Q Did they refer to a long, approximately 70-page opinion, of Mr. Allegretti?

A I have never heard of a 70-page opinion by Mr. Allegretti.

Q Doctor, have you had any subsequent meetings with representatives of General Electric Company since the visit in your home that you spoke about?

A Any subsequent meetings?

Q Yes.

A I have not.

Q Have you had correspondence?

A I have.

Q Or conversations with them?

A Yes. I have had telephone conversations and correspondence with Mr. Norman Fulmer and with a gentleman from Phoenix, Arizona.

Q And that I assume, is that limited to correspondence

subsequent to their visit with you?

A It was, yes. And I, of course, had one telephone conversation with Mr. Norman Fulmer about the visit ahead of time, one or possibly two, I don't remember.

Q Well, let's go to a different subject, Doctor. Is my understanding correct that no patent application was filed by you or on your behalf with respect to any of the developments included in the computing machine you developed at Iowa State College?

A That is my best knowledge and belief.

Q Do you know why none was filed?

A I do not know why an application was not filed.

Q Do you have -- can you make an educated guess?

A My educated guess would be that somebody goofed.

Q Do you have any idea who the somebody was?

A I do not know.

Q To the best of your knowledge, was any description of your computing machine at Iowa State College ever published in any technical journal?

A It was never published to the best of my knowledge and belief.

Q Would you know whether it was published in any form, and I mean published in a sense that it would be available to the public?

A To the best of my knowledge and belief there was no

such publication.

Q Do you know why there was no publication?

A I imagine because I did not desire it.

Q Well, as I understood your testimony, I think it was this afternoon, that one of your desires was to have a proper recognition of the facts in the development of the computer art, isn't that right?

A I realize the contradiction, Mr. Dodds. Your feelings and your motivations change with time for various reasons, and I think the reasons here are fairly clear and evident and those caused a change in my opinion.

Q Well, did that change in motivation occur approximately in May of 1967?

A Well, I wouldn't put it that way, no. I wouldn't put it that way. But, of course, it -- there was a period in which I was engaged with other things and which it was not on my mind.

Q Well, the approximate time, when did your motivation change in that respect?

A I desire a time to reflect and maybe two or three days before I can give an answer to that question, if you insist upon an answer to that question.

Q Well, if we are still here in two or three days I will put it this way.

A You ask me some other time. Maybe I will figure

that out, but I do know that there has been a clear regeneration of my attitude on this question a part of which is due to the gentleman named Norman Fulmer.

Q And that regeneration was initiated in May of 1967?

A In the summer of 1967, even later.

Q Summer?

A Yes. Part of it's due to him, I would point out.

Q Now, still referring to the patent problems, would you refer to your folder C-1. Doctor, I will not go over these individually, but if you will look through them, you will notice that there are a number of notes which I think you previously identified as being either in your handwriting or that of Clifford Berry?

A Yes. And I --

Q This represents, as I understand it, the results of some search work which you and Mr. Berry did in late December of 1940?

A That is correct. As far as I know that is the entire or the general subject of this folder.

Q And in these various pages of notes in folder C-1, there are quite a number of patents listed, United States Patents, some British patents and perhaps some other foreign patents, that's correct, is it not?

A It is.

Q Did you or Mr. Berry obtain copies of the patents

listed in this folder C-1?

A Not very systematically. Most of the material we could find out by search did not pertain to us to any, even -- even if the title was, led us to have an interest in a document, we might by a very brief perusal decide it was of no interest to us, and as a matter of fact, most of the material herein, except that it pertains in a general way to computing art, has no relevance to anything in which we were interested. So very few patents were obtained. Some of the patents we actually carried away with us and I cannot enumerate those for you. At the moment I have no immediate recollection of how to enumerate those for you. And some of them I remember we couldn't get.

Q Do you have, or do you know where they are, the copies of the patents which you did get?

A Well, I may have some on hand.

Q Would you be prepared to check your file to see which you have on hand and perhaps supply them to your counsel who then can perhaps in turn supply them to us and to Mr. Halladay?

MR. HALLADAY: Do you want the documents themselves or merely the numbers?

MR. DODDS: Just the numbers of the patents.

MR. HALLADAY: I have no objection to

that process.

MR. FALLON: So we understand exactly what's what, are you interested in those patents which he obtained in 1940 as contrasted to duplicate copies he may have obtained last year?

MR. DODDS: I am interested in any copies of patents listed in this folder C-1 which he may have acquired either then or later.

MR. FALLON: All right.

MR. DODDS: So they are presently in his files to the extent he can identify them.

MR. HALLADAY: Again all you are asking for is not the documents themselves but merely a listing?

MR. DODDS: That's right.

MR. HALLADAY: Of the numbers.

MR. DODDS: Yes.

MR. HALLADAY: I have no objection.

THE WITNESS: This will take a period of time.

MR. DODDS: That's satisfactory.

THE WITNESS: And I believe this will be included in that statement you asked me to send you.

BY MR. DODDS:

Q So you glance through these papers, Dr. Atanasoff, and see if there are any of those listed which ring a bell and which you think probably or with reasonable certainty you do have copies of? If that isn't practical you can ignore it.

A Well, I have just one. You know, in one French patent I translated the French into English and I would record this instance for you because it has pertinence here, and I don't care anyhow, I have no desire to sail under any false colors. And do you know, Mr. Dodds, I thought I had -- I thought that I had invented the use of the base two number system for computation at this period, and in some French patent I found a reference thereto. Mr. Dodds, are you able to hear me, Mr. Dodds?

Q Yes. Oh yes.

A Good.

Q Could that have been a patent to Kaufngle?

A I don't know, Mr. Dodds, and I don't know whether it's in this list.

Q Yes.

A But I remember finding this reference in the office, and you are asking me for my memory relative to these, and I remembered that most of this stuff is utterly irrelevant. Most of this stuff you have in your hands is utterly irrelevant. It's overwhelming irrelevant.

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MR. DODDS: Off the record.

(Discussion off the record.)

BY MR. DODDS:

Q Did this search in the study of patents which you reviewed change your opinion in any respect as to what inventions you had embodied in your Iowa State College machine?

A I can't think of a single one.

Q All right. I think you just mentioned possibly computation on the base two.

A Now wait a minute. As to the originality of that. Now, the French one spoke about the value of using base two in computation. I thought that was original with me but, of course, he did not use it in connection with electronic digital computing.

Q Yes. Do you recall any other features of computing machines which you discovered in this search which showed you that they may not have been original with you but you had previously thought they were original with you?

A I have no such recollection, Mr. Dodds. And I believe there were none. The complete irrelevance of the material is the only memory and impression I have from that date and we worked very hard.

MR. DODDS: Mr. Halladay, would it be convenient to take a short recess at this point?

MR. HALLADAY: Fine.

(Recess taken.)

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BY MR. DODDS:

Q Are we ready to proceed?

A I am.

Q Doctor, harking back to this visit from counsel for General Electric, how was that visit arranged?

A It was arranged by Mr. Norman Fulmer, who knew me. Well, he did know me at the time he worked on the computing machine, and he called me up and he said, "Members of the staff of General Electric and I would like to come down and visit you," and I said, "Fine."

Q What was the purpose of the visit?

A Well, I think the purpose was what they called uncertain patent situation that was developing in computing machines as of the time.

Q And what was the substance of your discussion with these gentlemen?

A I believe I've been over that. Let's see --

Q I think we talked about --

A Will you be more specific? Will you be more specific?

Q Yes.

A Because I am not quite sure how to begin.

Q You previously had indicated what you recall that they told you about this suit?

A Yes, they did.

Q And--

A And they told me that rather large royalties were being imposed on the industry currently by acts of your, of the corporation which you represent, and that these were being imposed in a pretty forthright way, and they said that the industry was in a certain state of turmoil consequent to the imposition of these royalties or the implementation of the collection under this royalty system. I don't exactly understand, so this is as far as I can go. Such words were used to me, Mr. Dodds.

Q Were they enlisting your help or assistance in connection with this problem?

A Well, they came down to discuss it with me. They have made no further effort, so I gather that they have at least they -- Norman Fulmer was more or less, I believe, tacitly elected to keep in communcations with me. I haven't heard from him for some time now, and he -- during the subsequent months there were several telephone conversations between us, always mostly of a pleasant and personal nature, and I am unable to give you more help than this.

Q But insofar as the subsequent telephone conversations were not of a personal nature, what was the substance of them?

A I don't know. Maybe -- I would be of the opinion they were saying, "Has Honeywell contacted you?" Maybe.

Q And you mentioned that the General Electric

representatives had referred to some high royalty which was being asked. Do you recall if they told you what that royalty was?

A How much in percent?

Q Yes.

A They did not tell me how much in percent, no, and I had no desire to find out or I would have asked them.

Q And you said that the industry was confronted with this problem. Did they mention what members of the industry were concerned with this problem?

A They did not. They just made such general statements, and I don't -- I would be glad to inform you if I knew which one because I don't think the gentlemen in question would mind having, being accused of this, but I just got this impression, and that's all I can do for you is give you my impression of the discussion which ensued in my house.

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Q My recollection was that you testified that you had inquired of them whether you should call Honeywell or whether they would, and they said they would?

A They said, "Honeywell needs you," and I said, "Well, are you suggesting that I call Honeywell?" They said, "Not at all. We'll call Honeywell," and they did.

Q Did they indicate anything which gave you an interest in calling Honeywell?

A Except the general situation which, in the course of

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normal conversation would be out on the table between us all, but which here is held under a cloud of obscurity by the law.

Q Well, I assume that if they had not volunteered to call Honeywell, you were prepared to call Honeywell?

A I don't have any idea whether I would have or not. I didn't so call Honeywell, at any rate.

Q As a result of your conversation with counsel for General Electric, did you get the impression that there was any arrangement or understanding of any sort between counsel for General Electric and counsel for Honeywell?

A I got the feeling there was not and would not be any such arrangement.

Q And how soon after this meeting with the representatives of General Electric Company did a representative of Honeywell call you?

A Oh, goodness, I don't know.

Q Was it a week, a month, a day?

A Oh, I would say it was a couple, three weeks, maybe, probably, maybe, I don't know.

Q When they made this comment, "Honeywell needs you," what was your response?

A I am an eager beaver, but not necessarily always inevitably eager, Mr. Dodds, and I, so what, let the cause be explained, was my reaction.

Q What was your response to them when they said --

A I said nothing. As far as I can remember, I said nothing. I don't think I would say anything under such circumstances.

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Q Now, let's turn to another subject now. Just one further question, did they indicate what the nature of Honeywell's need was?

A Well, Mr. Dodds, I don't know how to be sufficiently devious in such matters. I can only say that the discussions carried an element of the need, yes, they did. And the need was on the table because this was an ordinary conversation between individuals and not a case at law. And there was a general understanding of what the problem was and that understanding they made clear to me.

Q And just what, to go back, what was the need, in what way did they --

A I saw that coming. I will reply.

Q Pardon?

A I saw that coming, I will reply. I opened my big mouth once too many. I would say that -- I have previously told you that they -- that they had made intimations about the imposition of royalties and further efforts to collect royalties and the formation of a corporation for the purpose of collecting royalties and all of these things were subject, were subject of conversation. Now, if we could just mark this with Exhibit X and every time I have to repeat this we just say Exhibit X and you know it's the same group of answers that I can give you why I will be happy because that was the subject matter that we were referring to as far as I

know.

Q Well, I am sorry. Maybe I don't quite understand. I still don't understand just what it was that they thought that Honeywell needed that you could supply?

A Well, I guess maybe in view of your questions I don't understand it either.

Q You mean they didn't say?

A I am trying to think what they said. I guess I imagined it readily enough but as far as knowing, I did not know at the time.

Q Well, just a minute. I mean what did they say?

A They said, as far as I remember, they said the words which I described to you.

Q And nothing more?

A Oh, I am sure they said other things.

Q I mean on this particular point, Doctor, as to what the nature of the need was that you could supply?

A I suppose this reference was to information as to the development of computing machines. I supposed so at the time and I suppose so now.

Q You mean they did not say anything explicitly as to what they conceived Honeywell's need to be?

A You know, I am probing my memory. Now, the impression that my memory gives me of the subject at present is that if it is not that I don't know what it was.

Q That they did not give you any specific elaboration upon what they --

A I cannot swear they did not but I do not remember such.

Q Did they give you any indication as to why they thought it was Honeywell that particularly needed you rather than General Electric Company themselves or Control Data?

A They said there is a suit imminent or current or something of the kind.

Q A suit involving Honeywell?

A Yes.

Q Doctor, when did you first learn of the ENIAC patent application if ever?

A Now, this is to be separated and differentiated from ENIAC development, is it not?

Q Yes.

MR. FALLON: You said patent application?

BY MR. DODDS:

Q Patent application?

A Oh, goodness, I don't suppose I learned of that until Mr. Kirkpatrick came to my house.

Q Well, just a minute, Doctor. I think you have told me earlier that you have since this suit was started reviewed the ENIAC patent from which you know that it issued in 1964,

so it was not a patent application when Mr. Kirkpatrick visited you?

A That is correct.

Q Well, is it your answer that you never acquired any knowledge of the ENIAC patent application?

A I really don't know. I really don't know. It may have been that, the word ENIAC was mentioned by Mr. Etienne and I do not remember his mentioning the word ENIAC, so you ask me previously if Mr. Etienne mentioned the word ENIAC to me, I have no such memory and this is the state of my knowledge on that matter.

Q You have no present recollection of any prior knowledge of the ENIAC application?

A That's true. And I have had very little knowledge until Mr. Kirkpatrick came to my door with an issued application, that's right.

Q Issued patent?

A With an issued, I am sorry, an issued patent, right.

Q And was that your first knowledge of the ENIAC patent when Mr. Kirkpatrick appeared on your doorstep?

A I believe it was. Yes.

Q And I don't have the transcript back, did you say when that visit of Mr. Kirkpatrick was?

A It was in May of 1967, I believe. I hope I have got these right. I hope I am not getting a year off. I am

sure I am not. Goodness, that has got to be right.

Q Now, when was your first knowledge of the development of the ENIAC computer at the Moore School?

A You see Mauchly told me he was working on a computer and it was classified. Now, would you say that is the knowledge of the ENIAC computer?

Q I wouldn't say that if that was all that Dr. Mauchly said.

A The answer is that that is all, and I did not know it at that time, if that is agreeable to you. Now, I certainly read about it when it came out in the newspapers. I certainly knew about it at that time. Now, you will say when is that, and I am sorry that I will have to reflect or investigate or something to get the date.

Q Well, now, I think you have testified about a computer under development at the Naval Ordnance Laboratory in White Oak?

A I did.

Q Did you or your associates make a point of becoming informed of current development work on computers at that time?

A We certainly did.

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Q And do you know whether your associates had any knowledge of or familiarity with the work in the development of the ENIAC computer?

A Whether -- now it runs in my mind that we visited Aberdeen and saw a computer which I believe was an ENIAC at Aberdeen during that period.

Q That's the period '46-'47?

A It's roughly in that period. I can get you more refined dates.

Q And I would like to ask you the same question with respect to the 827 patent, not the patent application, but the 827 patent, when was your first -- when did you first learn of that patent?

A Well, I must give you more or less the same answer. It was certainly, if it was not the subject of conversation with Mr. Etienne, it was in Mr.Etienne's letter so I had that normal notice of it,but as far as having any knowledge of it, I did not receive that at that time. I did not receive that at that time, and that knowledge of that patent and the claims thereof came to my attention with Mr. Kirkpatrick at my door.

Q Doctor, did you ever take any step in the United States Patent Office to assert any rights of joint inventorship or otherwise in the 827 patent?

A In these two patents?

Q 827 patent?

MR. FALLON: I think the question is ambiguous because there is that, "or otherwise."

BY MR. DODDS:

Q I said a step in the United States Patent Office.

MR. FALLON: Let the witness answer if he can understand the question.

THE WITNESS: The answer is no.

BY MR. DODDS:

Q Did you ever take any step in the United States Patent Office to assert any rights of joint inventorship or otherwise in the ENIAC patent?

A I did not.

Q Have you at this time studied the ENIAC patent and the 827 patent disclosures and claims?

A Yes. But a rather brief effort in both cases. I wouldn't say that I am a proficient man in the 827 patent. I would say in connection with the other patent, ENIAC patent, I am less proficient.

Q And when did you make that study?

A Any study which I -- which has been made, was made during the course of these investigations.

Q That is after May, 1967?

A It was.

Q Would you refer to your folder E-2, document 395.

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I think you identified that as an agreement signed by yourself and which was dated July 5, 1941, and was that an agreement between yourself and the Iowa State College Research Foundation, is that correct?

A Yes.

Q Now, that agreement was replaced by a later agreement, was it not?

A You mean of recent date?

Q Yes.

A It was.

Q I show you a document and ask if you can identify this document?

A I seem to recognize it.

Q You can identify that as your current agreement between yourself and the Iowa State University Research Foundation?

A Yes, sir.

Q And this replaces, does it not, the July 5, 1941 agreement?

A I would say --

MR. FALLON: I think in this case the witness ought to examine the document again because it speaks for itself.

MR. DODDS: I am not quarreling with the exact language, if replacement is not the correct word--

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it supersedes, shall we say, the July 5, 1941 agreement?

MR. HALLADAY: In any event, for the record, from the plaintiff's side of the counsel table, and I think from the record, I haven't the faintest idea what piece of paper the witness has in his hand and it hasn't been identified. It hasn't been marked, and it hasn't been established and the parties are not stated and I object to the witness being interrogated about a mystical document that has no identity.

BY MR. DODDS:

Q You have identified this agreement?

A You have identified it to me.

Q Yes. You have identified it to me, have you not, as an agreement between yourself and the Iowa State University Research Foundation?

MR. HALLADAY: That's the first time that term has been used, Mr. Dodds.

MR. DODDS: No. It is not. He identified it in the first instance. However, I will give you a copy and ask the reporter to identify it as DPX-2.

(DPX-2 marked for identification.)

MR. HALLADAY: The stamp I have on my copy says Defendant's Exhibit blank, is that the way you are having it marked?

MR. DODDS: DPX-2 to identify it in the

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blank space.

MR. HALLADAY: Defendant's Exhibit DPX-2?

MR. DODDS: As indicated earlier, using as shorthand for Defendants' Pretrial Exhibit.

THE WITNESS: Yes. This is correct.

MR. DODDS: The question and answer are separated here.

BY MR. DODDS:

Q You do identify this as an agreement presently in force between yourself and the Iowa State University Research Foundation, correct?

A Yes.

Q Will you tell me the circumstances which led to the execution of this agreement DPX-2 to replace the 1941 agreement?

MR. FALLON: I might again request that the word "replace" be explained to the witness, if you would, Mr. Dodds; that you are not using it in a strict legal sense, I take it?

MR. DODDS: Suppose you suggest a term? I am trying to find any one. I don't care.

MR. FALLON: Well, the agreement says on its face that they wish to carry out the 1941 agreement. This is to my way of thinking an additional agreement.

MR. DODDS: Shall we call it a supplemental

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agreement?

MR. FALLON: All right. Fine.

MR. DODDS: I don't care what you call it.

THE WITNESS: Yes. That is true. That is really true. I am sorry, I wasn't quite sharp enough to catch that.

BY MR. DODDS:

Q Then what were the circumstances which called for the execution of this supplemental agreement?

A Well, having been counselled in regard to the possibilities of the principle of misjoinder and nonjoinder of invention, I consulted with counsel, and learned counsel, and learned counsel endeavored to assist my imagination relative to the subjects, and at the end of this period of consultation I contacted a gentleman by the name of Dan Griffen at the Iowa State College Research, Iowa State University Research Foundation.

Q Was this supplemental agreement initiated by you as a result of discussion with your counsel?

A Well, I am sure that they discussed it with counsel before they acted.

Q No. The question was, was it initiated by you after discussion?

A The whole matter, not the contract, but the

discussions on the subject were initiated by me, is that your question?

Q Yes.

A The discussions on the subject pursuant to this contract were initiated by me as a consequence of consultation between myself and counsel.

Q You say pursuant to the agreement, or do you mean discussions resulting in the agreement? Which came first, the discussions or the agreement?

A Well, gosh, the discussions came first.

Q All right.

A I am sorry if I got that backwards.

Q Now, do you understand that under this supplemental agreement you will receive anything of value over and above what you were entitled to receive under the 1941 agreement?

A Well, it's quite similar to the 1941 agreement. In that respect, I don't know to what counsel refers, could he be more explicit?

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Q I think it was suggested, are you to receive anything of value -- I am trying to avoid using the term, legal terms consideration and so forth; is there anything of value that you receive under the supplemental agreement that you were not entitled to receive under the 1941 agreement?

A I believe these documents speak for themselves and if they can't state what that is, I don't know what to say, Mr. Dodds.

Q That isn't the question and I didn't ask you whether you are receiving -- what I asked you was whether in your opinion whether you believe that you were receiving anything of value here over and above what you received by the 1941 agreement?

A I see.

MR. HALLADAY: Maybe, Mr. Dodds, if you could tell me the materiality of this or how it will lead to the discovery of anything that is admissible it would help me. I don't want to interfere with your discovery process here but --

MR. DODDS: I believe it's quite material.

MR. HALLADAY: I don't see what is germane to the issues posed by the lawsuit that we are taking a deposition in at this point.

MR. DODDS: I think it is quite

germane because this agreement for the first time refers to the assignment of Dr. Atanasoff's rights under the patent in suit.

BY MR. DODDS:

Q Now, I want to know if for that grant you consider, you believe that you received under this agreement or were entitled to receive anything of value which you were not entitled to receive under the 1941 agreement?

A This is reorientation of the 1941 agreement, a reorientation of the 1941 agreement in part. It is my opinion, if you want my opinion, my legal opinion, I don't know whether you are requesting that or not; I can give you a legal opinion if it's useful to you, Mr. Dodds.

Q I want any opinion, legal or otherwise, that you may have as to what you believe you received or receive or are entitled to receive under this agreement that you would not have received or been entitled to receive under your 1941 agreement?

A Well, under this agreement, Iowa State College agreed to prosecute.

Q Prosecute what?

A These rights, prosecute and effectuate these rights that are recited herein, and I guess we can all read.

Q Is there anything else that you believe that you received of value under the supplemental agreement that you

would not have received or been entitled to receive under the 1941 agreement?

A Well, at any rate, the agreement of May 1968 refurbishes the previous agreement, brings it up to date. There are some terms therein which are different. I can read them to counsel if that will be of service.

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Q No, I just want it in your own words, what you believe that you will receive or will be entitled to receive under this new agreement that you would not have been entitled to receive under the July, 1941, agreement?

A Well, the agreement states that if there is a consequence of the suit which Iowa -- of the action which Iowa State College has taken, and it is a peculiar action, and I do not understand it perfectly, if that is helpful, then, if as a result of that, there are monies received by Iowa State College, I will receive a part of them.

Q Well, I read from paragraph numbered 2 of the 1941 agreement, "The net proceeds from the licensing of any patent or patents" -- I assume those to be patents resulting in the computing machine to which reference is made -- "are to be divided equally between the Research Foundation and the inventor."

A Oh, I consulted counsel, Mr. Dodds, and they believed that for the sake of clarity that the previous agreement should be rewritten.

Q So that --

A I can give you the name of counsel, and you can ask them why they advised this.

Q I assume your counsel was Mr. Fallon or his associates?

A It was not, no, sir.

Q Well, then, may I ask who were the counsel?

A The counsel was Mr. Saunders of Mercier, Saunders & Associates in Washington, D.C.

Q So that the purpose of signing the new agreement was primarily on the advice of counsel that it would be advisable to do so?

A Now I have to divide the advice which counsel gives me from my own imagination. Is this a useful purpose?

Q All right.

A I don't know what percentage of the decision was caused by the advice of counsel and what decision seemed realistic to me, as a matter of fact, Mr. Dodds, I shouldn't admit this, I know I shouldn't, but I penned a good deal of the phraseology in that agreement which is in your hand.

Q Well, the thing that troubles me a little bit, Doctor, is that under Article IV of the supplemental agreement it cites, "That if any income is realized by the RESEARCH FOUNDATION from the assigned inventions, the RESEARCH FOUNDATION and ATANASOFF, as provided in the July 5, 1941 Agreement, will divide the net proceeds equally."

And so I come to the question, what of value did you believe you would be entitled to under this supplemental agreement that you would not have been entitled to?

A I will again recite for counsel the fact that I

will receive legal fees -- the cost of legal action under the present agreement.

Q Anything else?

A Nothing comes to my mind, but there may be, but there also may be more clarity in our interrelations, and this is a desirable state of affairs, and I don't desire additional litigation on this affair.

Q You will notice that under the provisions of Article I of the supplemental agreement, your rights in the 827 patent and the 606 patent, which I believe you will agree is the ENIAC patent, are assigned to Research Foundation?

MR. FALLON: No -- oh, yes. All right.

BY MR. DODDS:

Q Is that correct?

A It seems so, yes.

Q Let me ask you, why were these two particular patents enumerated?

A As compared -- now, you mean as contrasted with some other patents?

Q For example, -- yes, for some other patent, for example, the Eckert and Mauchly patent.

A Perhaps we haven't gotten around to the others.

Q I don't believe I quite understand.

A I don't understand you, so we are equal.

Q Well, my point was, the 1941 agreement, as I

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understand it, is assigned to the Foundation, all rights under any inventions and patents which might come out of your computing machine, just speaking loosely.

A All right.

Q Now, you have narrowed it down or boiled it down to two specific patents. My question is, why did you pick those patents alone or in preference to or in substitution for other Eckert or Mauchly patents?

MR. HALLADAY: Just a moment, please. For the record, the question is objected to in form as including a capsule version of the provisions of paragraph I, which is inaccurate.

BY MR. DODDS:

Q The question is not intended to represent any deviation from the substance of Article I of the supplemental agreement, and to the extent that it does, will you consider it as formulated in the sense of Article I of that agreement, and again, I ask why were these two particular patents specified and only these two?

A I stated that perhaps there are other patents which should have been stated here that we haven't gotten around to stating yet, and this will mean an additional draft of the agreement. As I understand your question, you mean, why did we choose these and not some others, and I say, I don't know about the others and so I wasn't inclined to state them.

Other people evidently didn't know about them or they would have stated same, and if it comes to our attention and seems important, why, they will be stated in the future, as far as I am concerned. I do not know if Iowa State University would agree with me, so I do not know whether any subsequent agreement will be executed.

Q Did you ever happen to come across a patent numbered 2,624,507 to Phelps owned by IBM?

MR. HALLADAY: What was the number, again?

MR. DODDS: 2,624,507 to Phelps, owned by IBM?

THE WITNESS : I do not have any knowledge of that patent.

BY MR. DODDS:

Q To the best of your recollection, you haven't had any familiarity with that?

A That's the best of my recollection, I haven't.

Q Now, I think you indicated that you first, it first came to your attention that you might have an interest in the 827 patent, the ENIAC patent, at the time of my conference with you, which I believe was in --

A Yes, that's true, Mr. Dodds. That's true, Mr. Dodds.

Q And do you remember the date of that conference?

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A No, but we can get it all right. It's of record with me, I am sure.

Q I believe it was in December of '67. Does that concur --

A You know, we tried to meet for Thanksgiving, Mr. Dodds, before Thanksgiving, and we couldn't do it, and it seems to me as if that's a logical date. Yes, it was.

Q Now, since that meeting, with whom have you discussed this question of possible rights in the 827 patent and the ENIAC patent other than counsel to which you have just referred? I think you referred to Mr. Saunders and Mr. Fallon and his associates?

A May I ask the advice of my counsel, if I am required to give the name of counsel whom I have previously employed, and who is not --

Q Surely.

A Am I required to give counsel whom I have employed and who is not present?

MR. FALLON: I think that is all right.

THE WITNESS: Would you prefer that I didn't?

MR. FALLON: If it's responsive to his question. He is not asking what the --

THE WITNESS: All right. The counsel with whom I have conferred is the firm of Watson

Cole, Grindle & Watson in Washington, D.C.

BY MR. DODDS:

Q And have you discussed this, the subject matter of your possible rights in these patents with anybody else? Let me refresh your recollection. I assume you have discussed them with counsel or representatives of Control Data, have you not?

A As a matter of fact, before I took any action at all I discussed them with counsel of Control Data and with counsel of Honeywell.

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Q And did you discuss them with counsel for General Electric?

A I have not.

Q Have you discussed them with any counsel or representatives of any other concerns?

A Not to my previous memory -- not to my current memory, I am sorry.

Q Now, you have, have you not, in order to establish your rights which you believe you have in the 827 patent, the Iowa State University Research Foundation brought a motion to intervene in the Control Data case, has it not?

A I haven't made such a motion.

Q No. I say, the Foundation has made such a motion, has it not?

A I believe so, yes. I have papers which purport to have that effect.

Q And do you know who initiated that proceeding, motion to intervene in the Control Data case?

A Why, if Iowa State University with whom I have this contract did not initiate it, I do not know who initiated it.

Q To what extent, if any, did you participate in the filing of this motion to intervene?

A Mr. Dodds, I am by no means running this case. The effect of the contract which you have before you has been carried out, and to the best of my knowledge and belief, it

will continue to be carried out, and I took no such action.

Q No. That wasn't quite the question, Doctor. The question was, to what extent, if any, did you participate in the discussions or the work or the preparation of this motion to intervene?

A Well, of course, my advice and counsel in regard to the affairs of the time have been available to counsel for Iowa State College who are pursuing this matter.

Q And have you participated, have you had discussions and done preparatory work in connection with that motion?

A I would say, in the sense that your words seem to imply, very little.

Q But -- I am sorry.

A But I certainly have participated.

Q You have done some?

A Sure, of course.

Q For example, you signed an affidavit which was filed in that, did you not?

A I did, yes.

Q And have you had conferences with counsel for the Foundation in connection -- with counsel or representatives, Mr. Griffen, in connection with the prosecution of this motion?

A Such conferences as I have had have been of a casual and a visiting nature, They are not work conferences and I do not intend to have work conferences with him, and the

effect of this contract, as I stated before, is being pursued.

Q And where were these conferences?

A Oh, I have been out to Dan Griffen's office a couple of times, been in to see him, say, well, "Hello, Dan," and so forth. I was even out to see Dan before any of this occurred. I mean, I have been by Iowa State College Research Foundation, you know. I used to know Quincy Ayres out there in years past, and so it's a place with whom I have had some degree of contact.

Q Have you had any conferences in the matter of the motion to intervene with others that Mr. Griffen?

A Well, I certainly discussed it with counsel for Iowa State University.

Q Mr. Fallon and his associates?

A Yes, sir.

Q Do you recall -- I think you testified that you had discussed this question of a possibility of your rights in the 827 patent and the ENIAC patent with counsel for Control Data and Honeywell. Do you recall when those discussions were?

A No, but -- I can fix them, but you know this business-

Q Approximately within the last year?

A No, you know, it was somewhat before the date hereof and the date hereof is the sixth day of May, 1968, and I presume it was certainly after your visit, if we can fix it that way, and I suppose it was sometime in the interim between

then and May, and perhaps in February or March or April, or some time along like that, and I will be glad to try to derive better values for you, sir.

Q I am sorry, I don't think you quite understood my question, Doctor. I was referring, I was adverting back not to the motion to intervene but to the discussion of your possible rights under the 827 patent.

A Yes, I realize that you are and --

Q I see.

A I certainly -- the sequence of events was roughly as follows, Mr.. Dodds: In the first place, I got a glimmering from learned counsel, and next, my imagination commenced to pursue that gleam, and next, I read some law, and next I consulted Watson, Cole, Grindle and Watson, a firm of patent attorneys in Washington, D.C., with whom I have had some previous association, and I saw, the first man I saw down there was Mr. Watson.

Then subsequently, I decided all of a sudden that if I was getting serious about this I had to play fair with the people with whom I had contracts. I examined my contracts to see if the assertion of such rights would have any relation to those contracts. I came out and visited with counsel for -- with counsel, and then I, upon visiting with counsel, then I approached Iowa State University, but as to dates thereof, that was the normal course of events, I

suppose, for me to follow, I don't know.

Also, along the way somewheres, Saunders, upon seeing him occasionally in regard to other matters, and I saw him and discussed the matter with him, and the form of this contract has been discussed with him a number of times.

Q Does this account which you have just given also include the matter of consideration of the motion to intervene in the Control Data case?

A You see, the concept of the ideas was what was on my mind, and after the concept of the ideas had been developed, then I approached Iowa State University, and Iowa State University have the records of actions which appertain thereto.

Q Was it then your original idea to initiate this motion to intervene?

A Well, bless me. This is the kind of things that counsel do. I don't believe -- this may not be responsive -- I don't believe it was my original idea, I don't believe so, but, you know, I can't be one hundred persent sure, Mr. Dodds. Maybe I did.

Q Whose original idea do you think it was?

A I think it was the idea of counsel for Iowa State University. To the best of my knowledge and belief, it was their idea.

Q Did that come out, perhaps, of one of these

conferences or meetings you had with Mr. Griffen?

A I don't believe so. I believe this is -- these are learned counsel. These are people who mean business in the field of patent law, and I assure you they can think for themselves. As far as my directing their efforts, that doesn't happen, in spite of my, what should I say, a sort of eager beaver type of man who labors in the vineyard of life on various and sundry occasions, and I also sew, I might add.

Q As well as reap?

A I try to reap.

Q And I think you said you discussed the question of the possibility of your having rights in the 827 patent and the ENIAC patent with counsel for Control Data. When did you have that discussion?

A The date thereof I cannot remember.

Q Approximately? Was it in 1968?

A Well, let's see. 1968. Yes, you know, it was after your visit, and so it must have been --

Q How much after, a month, three months?

A Yes, far enough afterwards so it had to come in 1968, yes, sir.

Q Was it two months or three months?

A I would say two or three months, yes.

Q And when did you have the corresponding -- strike that.

And what was the substance of your conversation with counsel for Control Data on this point?

A I told counsel that I was inclined to assert any rights which I might have.

Q This to Mr. Kirkpatrick, I assume?

A Yes, and Mr. Devine I believe was present. I am not quite certain, but I believe Mr. Devine was present.

Q Did you first raise the subject?

A I believe I did.

Q And what was their reaction?

A They were unhappy. They exhibited a slight degree of unhappiness with this decision.

Q And when did you first discuss it with counsel for Honeywell?

A I believe somewhere previous to the time I discussed it with Control Data, but roughly at the same time.

Q And with whom did you discuss it?

A It was discussed in a single day with the three principal members of the staff of Control Data -- I am sorry, of Honeywell, the two gentlemen present and Mr. Charles Call.

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Q What did you tell them?

A I told them the same thing that I told Control Data.

Q Mr. Kirkpatrick?

A Yes. Right.

Q And what was their reaction?

A Well, I believe that they took it rather much in stride and as is customary in such matters.

Q Well, they must have expressed themselves in some way?

A They did not advise me to continue or to desist, they told me they could not advise me on this matter and that was that.

Q Do you recall any other party with whom you discussed the possibility of acquiring rights in the 827 patent and the ENIAC patent?

A After leaving the discussion -- well, wait a minute. I will just put it this way. I discussed this subject with my son.

Q Did you discuss this subject with anyone associated with the Research Foundation other than Mr. Griffen?

A I believe not.

Q Any of the trustees in the Foundation?

A I did not so discuss it.

Q Or any directors of the Foundation?

A I did not. Mr. Griffen carried the discussion. There was a discussion with the, and Mr. Griffen carried that discussion.

Q Now, do you know whether the Research Foundation has given consideration to filing a motion to intervene in this action?

A Will you repeat your question, please?

MR. DODDS: Repeat the question, Mr. Reporter.

(The question was read.)

THE WITNESS: I believe they have so considered.

BY MR. DODDS:

Q Do you know the results of that consideration?

A I do not.

Q Do you know the criteria which they have taken into account in reaching a decision?

A I believe the Research Foundation has been advised by counsel. And the opinion of counsel is a criterion.

Q Do you know what that opinion of counsel is?

A I do not.

Q You don't have any -- put it this way. What is your educated guess as to what the position of the Research Foundation is with respect to filing a motion to intervene in this action?

A Well, I, as far as my legal knowledge goes, and you know, Mr. Dodds, it consists of a limited extent and experience and no formal training whatever, almost no formal training whatever, I can add, I would -- it would seem natural that the course of -- that thecourse of filing of such a motion here would be related to the action and decisions in Baltimore, but that's an opinion, and I am merely expressing an opinion, if you like my opinion why that's it.

Q What I was really interested in, in what you might know about the Research Foundation's views on the matter?

A I have no knowledge of the Research Foundation's views I am not a party to the discussions between Research Foundation and counsel. They always exclude me. They inevitably exclude me from such conference, and I therefore have no knowledge. Sometimes I get a little byword, but it will be a very casual one, sir.

Q Haveyou had any discussions with any other parties about the possibility of intervention in this action to assert your rights in the ENIAC patent?

MR. DODDS: Would you read the question, please?

(The question was read.)

THE WITNESS: Mr. Dodds --

BY MR. DODDS:

Q Speaking of intervention by the Foundation?

A You mean of my forcing the Foundation to do it?

Q No. Not of your forcing them to do it, but have you had any discussion with any party as to whether -- as to the advisability of the Foundation moving or not moving in this action?

A Oh, goodness, I haven't any such knowledge that has any substance or otherwise. I don't think that --

Q Have you had any discussions with anyone with respect to the ENIAC patent since the date of issue in 1964?

A I did not see the ENIAC patent until the current litigation began. I have discussed the ENIAC patent with counsel of Honeywell.

Q Anyone else?

A Almost none. No other discussions of substance, I am sure.

Q What do you mean, of substance? Have you had any discussions?

A Well, of course, my present counsel.

Q Yes.

A And I have said, well, we don't know much about the ENIAC patent, now, that's roughly the substance of the discussion there. We wish we knew more about it because we

rely -- once I had a discussion with you on the ENIAC patent, and you said you didn't know anything about the ENIAC patent as of that date, and I also told you at that date that I didn't have any other discussions of the ENIAC Patent. That's the way it goes, and if you mean am I engaging in any undercurrent of sub rosa activities with regard to ENIAC patent, I am not, and I haven't peeled off my coat and gone to work on ENIAC patent now on the advice of counsel, partly on the advice of counsel, at least, and my natural curiosity hasn't brought me to face the 147 claims or however many there are in that patent.

Q With what counsel did you discuss this ENIAC patent?

A With counsel for Honeywell.

Q Yes. And I want to assure you, Doctor, there has been no implication of any devious or underhand practice.

A I don't know --

Q I am trying to find out what discussions you have had.

A You are right.

Q Looking for information.

A I haven't been up against anything like you, and I don't mean to be obstinate or brief in my answers. I believe I am being quite complete in my answers, but the facts are I am trying to be responsive, trying very, very hard to be responsive but sometimes I am at a loss. Is there a question before me now?

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Q I think not. I think you answered the question. Now, in the supplemental agreement by which you, certain rights in the ENIAC patent are conveyed to the Research Foundation, have you given any consideration to the claims of the ENIAC patent to see which claims you think, to which you believe you have a right to assert a claim?

A I have no such list.

Q Have you reviewed the claims from that viewpoint at all?

A To make myself absolutely lily white, I must say that I have read with knowledge and yet, sufficient, and I have a memory of the, of claim 100, but of no other claim.

Q Only claim 100?

A It just happens that I do have that one and I have read other claims, certainly I have, Mr. Dodds, but at the present moment I have no -- I couldn't repeat the substance of any other claim to you and so I am absolutely lily white in my statement about the ENIAC patent.

Q Have you been asked by your counsel or by counsel for Honeywell not to familiarize yourself with the ENIAC patent prior to this deposition?

A I believe there was a hint that it was not their desire that I do so.

Q Coming back to your conference with Mr. Fulmer and the other General Electric counsel, did they give you any

indication that prior to their visit to you that they had been in contact with counsel for any other members of the computer industry?

A To the best of my knowledge and belief the answer is no.

Q This hint that you received that it might be just as well not to familiarize yourself with the ENIAC patent prior to the deposition, did that come from your counsel or counsel for Honeywell?

A Well, counsel for Honeywell have been paying me and they have been paying me remarkably well, and I don't think they wanted me spending part of that time investigating, investigating -- that's the impression I have. Now, that was not mentioned during the discussion but I gathered that was the substance thereof.

Q The answer to my question then is counsel for Honeywell rather than your own personal counsel?

A That is correct. I am sorry, and I wasn't responsive.

Q Now, I believe that you have previously indicated that in preparation for establishing your rights which you claim in the 827 patent and the ENIAC patent, you were asked to construct a reproduction of the Iowa State College machine, is that correct?

MR. HALLADAY: That's not correct in the course of this deposition, Mr. Dodds. I heard no

such statement made.

MR. DODDS: All right. Then we will come back to -- I would like to have marked as DPX-3 an affidavit executed by the witness on July 26, 1968.

(DPX-3 marked for identification.)

BY MR. DODDS:

Q I show you a copy of this exhibit and ask you if you can identify it? Do you identify it?

A I do identify ithat.

Q And you will notice in the first full paragraph on page two is the statement, "Mid 1967 he," meaning affiant, "was contacted by Allen Kirkpatrick, attorney for defendant, to ascertain the particulars of affiant's 1941 work. Affiant was asked to begin construction of a reproduction of his 1941 machine." That statement under oath, I assume, is a correct statement?

A I believe it is.

Q Now, what were the circumstances under which Mr. Kirkpatrick asked you to begin the construction of the reproduction of your 1941 machine?

A My own hesitancy, it relates to the position that I am in with respect to Mr. Kirkpatrick. Mr. Kirkpatrick is not here to object, and I request permission to ask my counsel relative to this matter.

MR. DODDS: Surely.

THE WITNESS: Do you believe, now, Mr. Kirkpatrick might object to my making statements on this. He is not here to make such objections. I am wondering if, therefore, I am not sure of the conditions under which relations between Mr. Kirkpatrick and I should be disclosed.

MR. FALLON: I quite agree with the witness. You have heard what he said here, Mr. Dodds. I think that this would invade Mr. Kirkpatrick's work product, and I am not familiar with anything more than the fact that has been put down here, and I believe this is quite outside the scope of the direct examination so that if there is going to be any further inquiry on this, in all fairness, it should be done with Mr. Kirkpatrick' forewarned.

MR. DODDS: Well, I disagree with that completely. In the first place, as I understand, Mr. Kirkpatrick is not the witness' counsel, and any privilege would be asserted by Mr. Kirkpatrick. Insofar as --

THE WITNESS: I have heard the word -- may I -- and I venture with great trepidity here, sir. I have heard the word, "work product," used, and I would like an affirmation from Mr. Kirkpatrick that this is not part of his work product, and what constitutes his

work product I have only the vaguest of opinions and I raise the question for learned counsel.

W-18-1

MR. DODDS: Well, I will reserve this question until the conclusion of cross-examination. We may need the aid of the Court in obtaining an answer if the witness' counsel advises him not to answer it.

MR. FALLON: The specific question you want to have answered is what?

MR. DODDS: What were the circumstances under which Mr. Kirkpatrick asked Dr. Atanasoff to construct a reproduction of the 1941 machine?

MR. HALLADAY: That is not a correct statement of the language of the affidavit.

MR. DODDS: I believe it is. I stand on it.

MR. HALLADAY: In any event, the affidavit reads --

MR. DODDS: I read the affidavit into the record previously.

MR. HALLADAY: "Affiant was asked to begin construction of a reproduction of his 1941 machine."

And do I understand the question now is something beyond that?

MR. DODDS: The question is, for the third time, the circumstances under which that request was made.

Do you advise your client not to answer, Mr. Fallon?

MR. FALLON: I prefer to keep this on a friendly basis, Mr. Dodds. You have already stated that you would be willing to defer this to the end of the cross-examination. I will personally call up Mr. Kirkpatrick and see what his feelings are on the matter. I think that this is a courtesy we can extend to him. We are all adversaries here, and I would like to do that, since it apparently will not inconvenience you, I mean, to put this over, say, until tomorrow or the next day. You have indicated that we will be here until Friday anyway, so I would like to do that.

MR. DODDS: That is acceptable. If you are going to contact Mr. Kirkpatrick, then I think it is only fair to advise you that I would like to further inquire as to the status of the work which Dr. Atanasoff has done pursuant to that request.

MR. FALLON: All right.

BY MR. DODDS:

Q Dr. Atanasoff, you demonstrated here yesterday, I believe, Exhibits Y and Y-1, the test unit and what you indicated was a reproduction of the add-subtract mechanism of the 1941 machine. Was that -- were those exhibits constructe on the request of counsel for Honeywell or were those a part

of the work and the reconstruction of the machine for Mr. Kirkpatrick?

MR. FALLON: You may answer.

THE WITNESS: They were constructed at the request of Mr. Kirkpatrick.

BY MR. DODDS:

Q Coming now to another subject, Doctor, am I correct that you have either testified or that you told me that the Iowa State College machine on which you were working, which has been called for the convenience of all the abbreviation, the ISC machine, was constructed to correspond to the manuscript or booklet, Exhibits 455 or 456?

A Mr. Dodds, the machine was -- first, the machine was under construction with notes and the like. Then the manuscript was written and then the machine was finished, and then there was additional writings on the machine.

Now, the manuscript, I feel -- well, I can't tell stories here. Let's see. The machine, as far as I know at this instant is quite, at the time that John W. Mauchly saw it, is quite precisely according to the form of the manuscript.

Q Will you refer to your folder F-2, please, which includes these exhibits 455 and 456 --

MR. FALLON: Is that what you want him to look at?

MR. DODDS: I want him to look at the other, too, please, Mr. Fallon.

MR. FALLON: I thought the manuscripts were in F-4.

MR. SHIMER: F-4 is correct.

MR. DODDS: I am sorry. I have it as F-2. I am sorry. It's F-4.

BY MR. DODDS:

Q Would you glance through that and can you agree that those documents identified by the numbers 458 to 462, inclusive, are preliminary drafts?

A 458 to 462?

Q 458 to 462?

A This material is material incident to the preparation of the bound copies, and hence I suppose it could be called preliminary drafts. It may also contain material which was left over after the copies were completed, but if you call all that -- if you just characterize it as material pursuant to the construction of the draft, you will have the meaning there.

Q Yes. So as a practical matter, I am just trying to shorten this, we can forget about the documents 458 to 462 and confine our consideration to 455, 456 and 457?

A I would think so. I am not quite sure the purposes which you wish to serve, but for the purposes that I can

imagine, this seems to be a true statement.

Q Well, we will put it subject to error so if any point comes up that is inconsistent, we can disregard those.

A Right.

18/2/1
WS KL

Q Now, if you will look at 455 and 456, I believe you recalled that 456 was essentially the same as 455 except it had been retyped?

A Yes. I found differences of typing in those two copies when I examined them.

Q Well now, 456 also omits the financial, reference to the financial statement in paragraph one, and the last two pages which were the financial statement, is that correct?

A Yes, I can verify that. I believe that is correct. 456. Yes, 456 has the financial statement -- no, 455 has the financial statement. May I correct myself?

Q 456 omits the financial statement?

A Yes, it does.

Q Now, if you will refer to page 21 of each of the documents, in the penultimate line I believe the spelling of "punch" has been corrected in 456 as compared to 455?

A Yes, there is no "n" in my --

Q The spelling has been corrected in 456?

A Yes. I don't know that that makes 456, I don't know that that assures that 456 was typed afterwards, because sometimes opposite things happen in typing.

Q Well now, that comes to the next question. When was each of these typed?

A They were typed almost at the same time. I would say within the same couple of weeks or so, and there were two

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typings, to the best of my knowledge and belief, and the two typings embraced, perhaps, oh, I don't know, we had to have pretty good copies and probably we didn't get more than three copies. We didn't have electric typewriters in those days, and probably three or four copies is all we could get, and maybe some other copies in this material were rejected after typing of this.

Q When was that?

A In August of 1940.

Q August of 1940. Well now, were there any later --

A And the preparation may have begun in July, but I know that I started on the preparation of this material and worked on it very hard and it has as many copies of the material which you received, many preliminary copies, including original handwritten hand draft of my own on the subject, and I can't do any better than that for you, Mr. Dodds.

Q But these two typings, 455 and 456 were in August, 1940, you believe?

A Yes, I believe so.

Q And when did each of these come into your possession?

A Each of these?

Q Yes.

A They have been in my possession since that day except for the normal delay in the typists getting the stuff up to me and having it bound. I don't know whether we bound

it there or sent it over to some college institution to have it bound. I can't remember as to that, but except for that, they have been in my possession ever since.

Q Now, can you tell me, were there any later typings of this manuscript?

A To the best of my knowledge and belief, there were none.

Q To the best of your knowledge and belief, were there any earlier typings?

A There were none, except that material which was used preparatory to this, and that doesn't only include the material here, but other material in this file.

Q Yes, but I am speaking of the final bound forms.

A That's right.

Q Now, I think you testified at pages 656 to 658 of the transcript that copies of either 455 or 456 were given to Dr. Stewart, to Mr. Poillon of Research Corporation, to Scientific Aids for Learning, and to Dr. Weaver, is that correct?

A Yes. I believe that list -- that list sounds exactly correct, and I believe it is correct.

Q Subject to error. I checked the transcript and I found those names.

A Yes.

Q Do you have any recollection of a copy of either

455 or 456 being sent to anyone else?

A I do not.

Q Did you send one to, was it Mr. Gross or Dr. Gross?

A Mr. Gross never had a copy, no.

MR. DODDS: Mr. Halladay, would this be a convenient breaking time for the day?

MR. HALLADAY: It is agreeable with me if it is agreeable to everybody else.

MR. DODDS: Is 9:15 in the morning all right?

MR. HALLADAY: That is agreeable.

(Whereupon an adjournment was taken until 9:15 o'clock a.m., December 5, 1968.)

VOLUME VIII

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

- -x

Honeywell, Inc.,

Plaintiff,

-vs- 4-67 Civ. 138

Sperry Rand Corporation and Illinois Scientific Developments, Inc.,

Defendants.

- -x

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 9:25 o'clock A.M., December 5, 1968.

(APPEARANCES AS HERETOFORE NOTED)

Whereupon,

DR. JOHN V. ATANASOFF,

witness having been previously sworn, was examined and testified further as follows:

CROSS-EXAMINATION (CONTINUED)

MR. DODDS: Might I inquire, Mr. Fallon, whether you were able to get in touch with Mr. Kirkpatrick with respect to the questions which were left open yesterday?

MR. FALLON: Yes, you may. And I will tell you what happened. This morning I called Mr. Kirkpatrick's office and learned that he is unreachable, being on trial until Monday in New Orleans, and I have given the matter some further thought, and I have no objection to your question to Dr. Atanasoff and I recommend that he answer it.

MR. DODDS: Thank you. One or two other preliminaries. Is a copy of the contract between Honeywell and Dr. Atanasoff of which we spoke available?

MR. HALLADAY: Yes.

MR. DODDS: Could we see a copy of it?

MR. HALLADAY: Oh, well, availability doesn't mean it's in this room.

MR. DODDS: I am sorry.

MR. HALLADAY: If you wish it

immediately then I suggest we suspend while I go find it.

MR. DODDS: No. I think it would be better perhaps if we could do that at the noon recess.

MR. HALLADAY: Fine.

MR. DODDS: And lastly of the preliminaries, the question of the chronological notes to which Dr. Atanasoff was referring, if we might see those?

MR. HALLADAY: I would like to make the record clear that Dr. Atanasoff was in my observation as referred to the chronological notes only by saying that he was referring to same and as far as I can recall never in fact referred to them in terms of examining them while being in the process of testifying.

MR. DODDS: I don't believe that is a hundred percent accurate.

MR. HALLADAY: Well, then, for clarity, may the record show that I am handing Dr. Atanasoff a bound book on the front of which is his signature. And may I ask you, Dr. Atanasoff, if this is a document to which you have made verbal reference in the course of your testimony here?

THE WITNESS: It is.

WS
EX#2
KL-1

MR. HALLADAY: And in the course of your testimony, have you from time to time had that document before you?

THE WITNESS: I have.

MR. HALLADAY: And in the course of your testimony, have you referred to it in the sense of reading it?

THE WITNESS: I have threatened to refer to it two or three times and reached for it. I have never looked at it once.

MR. HALLADAY: Other than in its condition before you?

THE WITNESS: That's right.

MR. HALLADAY: Have you opened it from time to time?

THE WITNESS: I have opened it, but I have never read one line in it.

MR. HALLADAY: All right. In any event, the document you have before you, I now produce and offer to you, Mr. Dodds, the opportunity to inspect same.

MR. DODDS: Thank you. Just by way of identification, could we have this marked as DPX-4?

(DPX-4 marked for identification.)

MR. DODDS: To complete the record on

the point, I refer to page 180 of the transcript in which I commented that I wanted -- "I would just like to have stated on the record that Dr. Atanasoff is apparently referring to some notes which are not a part of the exhibits D-1, the exhibits to which we have been referring."

MR.HALLADAY: That is your statement.

MR. DODDS: That is right.

MR. HALLADAY: At the time, I think Dr. Atanasoff made some comment in response to it.

MR. DODDS: I find no comment in response except an answer to the question immediately preceding my statement.

MR. HALLADAY: In any event, I don't have the transcript before me, but my memory tells me there was a response made substantially of the kind that Dr. Atanasoff made this morning.

MR. DODDS: There is such an occurrence at page 244 of the transcript later in which I called attention to the notes and Dr. Atanasoff said "That is not" -- wait. I will go back.

Again, I said, "Just a moment. I think the record should show that Dr. Atanasoff referred to his notes in a folder which he has referred to as his chronology as aiding him in fixing that date.

"THE WITNESS: May I comment?

"MR. HALLADAY: That is correct.

"THE WITNESS: That is not correct. I didn't refer to them. I started to and found I didn't need to."

But in the first instance, I believe, as I cited before on page 180, Dr. Atanasoff did refer to the notes.

MR. HALLADAY: I beg your pardon. You made the statement that he had and my position is your statement was and is inaccurate.

MR. DODDS: All right. There was no comment. The witness did not disagree with it at the time.

MR. HALLADAY: He wasn't asked to agree or disagree.

BY MR. DODDS:

Q Dr. Atanasoff, how were these notes prepared?

A What notes?

Q I believe the title is, this copy is not distinct, Chronological something.

A Chronological Events, I guess, List.

Q How was this list prepared?

MR. HALLADAY: If you know.

BY MR. DODDS:

Q If you know.

A In part I know.

Q Well, tell us the part that you know.

A I commenced to collect dates of events within my experience from the records. As far as I know, all of those have reference to records.

Q The actual preparation, physical preparation of this list, was it done by you or someone else?

A It was done by a variety of people, partly by me.

Q The copy I have before me is a reproduction of some sort. Do you have the original or is your own an original? This is obviously a reproduction of some document of a smaller page size.

A Well, there have been other copies and the exact status of that relative to those little copies I cannot inform you, sir.

Q Was this copy you were referring to or is this a different copy that you were referring to the other day?

A This is the copy I was talking about.

Q This is the exact copy?

A Well, it's the copy I had here before me. If that was the exact copy, I am not sure. Are you questioning whether this is the exact copy I had before me before? May I look at it?

Q I was wondering if this is the same one or if you had a different copy? That was all.

A This is the copy I had on the desk previously.

Q The very copy?

A The very copy, and I wrote my name here on it and I identified that signature and I have signed no other documents with my name on the front.

Q So this was, then -- I gather the physical work of actually typing this up and binding it, putting it together was done in these offices, is that correct?

MR. FALLON: Do you know that?

THE WITNESS: Well, I have perhaps enough information to allow me to infer that.

BY MR. DODDS:

Q Then if you will, will you refer back to the question of the construction of a reproduction of the 1941 machine, and I believe it is already of record that you were requested by Mr. Kirkpatrick, counsel for Control Data, to do this. Now, would you tell us the circumstances under which that request was made?

A Yes. Mr. Kirkpatrick and I were together. I am sorry, I cannot remember the place. We were together a great many times and talked about a great many things, but we were together someplace, perhaps at his office or perhaps in my home or perhaps somewhere else, and he said, "Could you prepare

a working model of your computing machine?" and I said I could. And then some weeks elapsed and the subject came up again in a conversation between us, and maybe it came up a third time, I don't remember exactly, but there were some such discussions, and each time this was the subject of conversation. I mean, each time we spoke about it the words were more or less the same, and could I do it, and I said I could. Then he said, "Well do it," and I did.

Q I am sorry. You hadn't finished?

A I think I had finished. That's a good place to put a period. Ask me what you will, sir.

Q What time period was this, these several conversations?

A It's not in the chronology, either, and that won't do me any good. I don't know, but let's see. I believe it was during last summer, not the just past summer, but I believe it was the summer before that we had the conversations.

Q That would be the summer of 1967?

A Yes, so probably, let's see -- no, that is not right. Let's say the fall of 1967 would be better, a better guess.

Q And more specifically, just what did Mr. Kirkpatrick ask you to do?

A He asked me to prepare a model which would demonstrate the regenerative memory and the add-subtract mechanism

and the other appurtenances of the machine.

Q Well, did he ask that the reconstruction of the machine be in accordance with your manuscript, for example, Exhibit 455, or in accordance with the machine as it existed at the time that you left Ames, or some other state?

A His guidance there was that it should be constructed in accordance with the manual 455. However, that isn't exactly right, because he specified that it would only have one circle of condensers on the add -- on the CA and one circle of condensers on the KA, and he specified a rather limited number of digits in the base two system. I believe he said three or four, but in the end, the machine was constructed with twelve digits on the base ten system and with one row of condensers in CA and one row of condensers in KA.

Q Is that work completed?

A In the course -- yes, I would say it's completed. Yes.

Q Did you keep any record from point to point during the process of its construction, notes or diaries or logs or anything of that sort?

A I have no such logs or diaries.

Q Did you prepare any drawings or circuit diagrams for use in constructing the machine?

A No, there were none prepared, but after the machine was completed or as the machine was completed, why, a

technician made a circuit diagram.

Q Do you have a copy of that circuit diagram available?

A I do not.

Q Where is it?

A Well, there are certainly copies in Mr. Kirkpatrick's possession.

Q Are there any copies in these offices, to your knowledge?

A I don't know where they would be.

Q I say, do you know if there are any in the possession of Mr. Halladay or Mr. Allegretti or his associates?

A You see, the machine has been here and there have been copies here.

Q You don't know whether there are any here now?

A I do not know whether there are any here now.

MR. DODDS: Might I ask, counsel for Honeywell whether copies of the circuit diagram are available in this office or the office of Mr. Allegretti?

MR. ALLEGRETTI: There are none in my office.

MR. HALLADAY: I don't know what we have here.

MR. DODDS: May I ask counsel to inquire as to whether any are available in these offices?

MR. HALLADAY: You may ask me, but whether you get an answer, I don't know.

MR. DODDS: You mean you refuse to answer?

MR. HALLADAY: I am not under examination.

MR. DODDS: I mean, you refuse to comply with my request?

MR. HALLADAY: I don't refuse to do anything.

BY MR. DODDS:

Q Do you have, Dr. Atanasoff, copies in your possession at your home?

A I do. I am not sure these copies that I have in my possession are true representations as of the present condition of the machine, however.

Q Where would, in whose possession would be the circuit diagrams representing the present final condition of the machine?

A Mr. Kirkpatrick has them in his possession. Directly or indirectly, they are in his possession. His agents connected with the organization by whom he is employed must have possession of the machine.

Q You mentioned about the machine being here. Is the machine physically here at this time?

A It is not. I mean, to the best of my knowledge and belief, it is not. I don't really know. You know, I am getting touchy here because I would just use ordinary language and ordinary methods of conversation but I find they don't suffice and that I have to be very critical of the kind of remarks I make. Now, as far as giving evidence, I cannot give evidence that it is not here, no.

Q Is it true that you do not have any personal knowledge where the machine is at the present time?

A Not direct, no evidence that I could swear to.

Q What is your best belief as to where the machine is at the present time?

A My best belief is that it is in Washington, D.C. -- in Rockville, Maryland.

Q At your home?

A No, that is not my home.

Q Well, where in Rockville, Maryland?

A At a Control Data organization in Rockville, Maryland.

Q Now, I believe you have previously testified that exhibits identified as Y and Y-1 which you demonstrated were constructed at the request of Control Data, and were they constructed as an adjunct to that machine?

A Yes. You see, Mr. Dodds, I didn't want to construct the machine without constructing a test set because a test set was needed to test the add-subtract mechanism. This was the procedure employed?

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Q Well, then, from what you say, I gather that the machine itself and the adjunct apparatus exhibits Y and Y-1 were the property of Control Data Corporation, is that correct?

MR. FALLON: If you know.

THE WITNESS: You know, I am not -- I am not informed of relations between the parties here. You know the habit of counsel to keep things to themselves I suppose that they formed these habits from necessity. Whether it is the property of Control Data or someone else I do not really know. I think it is where I stated it is.

BY MR. DODDS:

Q You think it's the property, your best belief is it's the property of Control Data?

A My best belief is that it's in Rockville, Maryland.

Q Well, that didn't quite answer my question. Your best belief is that it's the property --

A All right, perhaps I can say that.

MR. HALLADAY: Just a moment, please. It seems to me the witness is misunderstanding the question. He is not asking you where anything is.

MR. DODDS: I am examining the witness and I want to ask the witness if he understood my last question.

MR. HALLADAY: You can examine him all

you please, but when you get him confused, I am allowed to interrupt.

MR. DODDS: I will ask the witness if he is confused and whether he understands the last question, and I will ask the reporter to read the last question and then I will ask him if he understands it.

(The question was read.)

MR. HALLADAY: And the preceding questions had to do with the test set.

MR. DODDS: The test set and the machine.

MR. HALLADAY: Then it's objected to as a double question.

MR. DODDS: No. I will start all over again. Maybe it's simpler.

BY MR. DODDS:

Q To the best of your belief, Dr. Atanasoff, is the machine a reconstruction of the 1941 machine which you have talked about, is that, to the best of your belief, the property of Control Data?

MR. HALLADAY: Also objected to as an incorrect statement of what the machine is.

BY MR. DODDS:

Q Will you please answer?

THE WITNESS: Will you read the question back so I can see if I can answer it?

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(The question was read.)

THE WITNESS: It was the property of Control Data. Is that responsive?

BY MR. DODDS:

Q Yes. But the next question is, the same question with respect to the adjunct apparatus, Exhibits Y and Y-1?

A It was the property of Control Data to the best of my knowledge and belief.

Q Do you have --

A I am sure that's correct.

Q Do you have any knowledge of any change in the ownership since the time of which you spoke when it was the property of Control Data?

A I have no knowledge.

Q Where was the machine itself and the adjunct apparatus constructed, or if they were constructed in different places, will you state where each was constructed?

A The apparatus was constructed at my home.

Q And who did the actual construction?

A A mighty lot by me.

Q Pardon?

A A mighty lot by me. And I had an electrician -- I mean an electronic technician assisting me.

Q Anyone else --

A I am sorry, I didn't mean to interrupt you?

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A And I will get this in usable form here. Then the electronic technician, before the machine was complete, the electronic technician became unable to continue, and I got another electronic technician to help and in this way the machine was finished.

Q Was there anyone else that worked in the construction of the machine and/or the adjunct apparatus?

A Mr. Brown, my man of all help.

Q And these two electronics technicians to whom you referred, by whom were they employed?

A One of them, one of the technicians was employed by Arrow Jet General Corporation, and he was moonlighting on the job, and the other technician was employed by Control Data in some way.

Q Now, in the course of your construction of this machine and the adjunct apparatus at the request of counsel for Control Data, were you acting as a consultant or adviser to Control Data or to his counsel?

THE WITNESS: Will you repeat the question please?

MR. DODDS: The reporter, please?

(The question was read.)

THE WITNESS: I was.

MR. FALLON: I think --

THE WITNESS: Pardon me, I answered it.

MR. FALLON: Okay.

MR. DODDS: I am sorry. Did you answer it?

MR. FALLON: He said he was.

BY MR. DODDS:

Q And what were the terms of your arrangement with Control Data or its counsel other than compensation? I am not inquiring as to compensation but what were the terms of your arrangement?

A There were no special terms arranged for this purpose. There were just the normal terms of my arrangements with Control Data.

Q What were those terms?

A I got personal compensation, and I also got expenses, and I just proceeded that way.

Q Then unlike your arrangement -- I am sorry?

A There was no overhead charge or complicating factor like that and I just, I just billed them for the time, for a fraction of the time I put in, in reality, and then billed them for expenses.

Q Then unlike your arrangement with Honeywell there was no formal agreement?

A I did not say that.

Q Well, I am asking you, was there a formal agreement?

A There was a formal agreement.

Q Do you have a copy of that?

A I do not.

Q You mean you do not have it with you?

A I do not have it with me. Yes.

Q But you have it at your home?

A I do not have it in my home.

Q Well, where do you have it?

A I have it in my bank box.

MR. DODDS: I am sorry, Mr. Reporter?

(The answer was read.)

THE WITNESS: Bank box, yes.

BY MR. DODDS:

Q You have said that you billed Control Data for a fraction of the time which you expended in constructing the machine, what about the other fraction?

A Well, I would like to strike that remark, it just complicates things. Nobody else paid me. May I just put it that way. Is that what you wanted to know?

Q That's fine. Thank you. Who paid the salaries of the two electronics technicians to whom you referred?

A I paid the salaries.

Q Under a reimbursement arrangement with Control Data?

A I had explained to counsel that I had an arrangement

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with Control Data whereby I could bill for my services and bill for expenses. That was just an expense as far as I was concerned.

Q And under this agreement with Control Data, what were the nature of your duties?

A It was a consulting arrangement in which I was to assist them in developing the history of the computing art and render such other services as might be required and I was willing to give. I believe some such terminology in the contract, but I am not -- but that was understood, anyway, if it wasn't in the contract.

Q I just want a general idea, Doctor?

A Yes.

Q What was the duration of this agreement, was it indefinite, open ended, you might say, or was it for a definite period?

A It is an open ended agreement.

Q I am sorry?

A It was an open ended agreement.

Q Is the agreement still in force?

A In my mind it is.

Q All right. Doctor, may we return to a different subject. Yesterday we were talking about the manuscript as represented by booklets 455, 456 and 457. Perhaps you could get those out. Dr. Atanasoff, I believe that the

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correspondence which has been identified shows that copies of one of your manuscript booklets 455 or 456, I think you said, went to Mr. Poillon of Research Corporation, to Mr. Stewart of Scientific Aids to Learning and to Mr. Weaver, and the dates of the correspondence would indicate that the copy went to Mr. Poillon on November 8, 1940, to Dr. Stewart on August 21, 1940 and to Dr. Weaver on August 22, 1940. You have no occasion to dispute those dates?

A I have no such occasion.

Q Now, I would like to refer you to Davis Deposition Exhibit, I believe the number was 30, though I am not positive of that number, which is, according to Mr. Davis' testimony in his deposition, a copy of the manuscript which was sent to Research Corporation, to Mr. Poillon, he identified it, and this is a photographic reproduction of a Xerox reproduction of their copy which he supplied to counsel in connection with that deposition.

MR. FALLON: Before you ask any question on that, Mr. Dodds, you have referred to a Davis deposition. Now, I don't know whether the witness has had the opportunity of attending that deposition?

THE WITNESS: I did not attend it.

MR. FALLON: Did you see a transcript of that?

THE WITNESS: I did not.

MR. FALLON: You know nothing about the deposition except what you heard?

THE WITNESS: I was about to say this. I was about to say this.

MR. FALLON: All right.

MR. ALLEGRETTI: What case?

MR. DODDS: This is an exhibit marked by plaintiff in this case at that deposition taken by plaintiff, and I just identified where it came from. I am -- I just asked Dr. Atanasoff to compare this with that, that's all.

MR. FALLON: All right.

MR. HALLADAY: My understanding is that was the deposition of Albert --

MR. DODDS: Albert S. Davis, Jr.

MR. HALLADAY: Albert S. Davis, Jr. of Research Corporation taken on behalf of plaintiff in this case, and the document you have in your hand is a Xerox reproduction of what Mr. Davis identified as Exhibit 30?

MR. DODDS: Off the record. May I have off the record, Mr. Halladay?

MR. HALLADAY: All right.

(Discussion off the record.)

MR. HALLADAY: Why don't we go back on the record?

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BY MR. DODDS:

Q Dr. Atanasoff, would you refer to your letter to Mr. Gross of August 2, 1940 that's in folder B-5, Exhibit 52. I am sorry, I think you also need to refer to folder F-3, a paper, Exhibit No. 451.

MR. FALLON: 451?

MR. DODDS: Yes. It's a letter from --

MR. FALLON: 450, 451, that sort of thing?

MR. DODDS: That's the one, 450. I just want a simple question.

BY MR. DODDS:

Q In the fourth paragraph of Exhibit 52, you ask Dr. Gross to prepare a "resume outlining the developments as you remember them with approximate dates," etcetera. My only question, is the paper, Exhibit 451, the resume which Dr. Gross applied in response to your request?

MR. FALLON: Read the whole thing here to make sure you understand it, if there are any other implications in it. When Dr. Atanasoff is through reading, would you read the question to him so he knows exactly what he is answering?

MR. DODDS: Actually I believe there is no question. There are these exchange of letters, three letters. They don't use the same language. I believe

they are connected. I just wanted to make certain of the connection.

THE WITNESS: Will you read the question?

(The question was read.)

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THE WITNESS: 451 --

BY MR. DODDS:

Q It should be 450 and 451 and 452, I believe.

A I would presume so. I have no evidence to the contrary.

Q Then if you will refer in the same folder B to exhibit, I believe it's 56, your letter of August 26, 1940, to Dr. Gross --

MR. FALLON: What was the number again, Mr. Dodds?

MR. DODDS: It's in folder B-5, 56, document 56.

BY MR. DODDS:

Q Now, in the last paragraph, I want to ask you whether or not the last paragraph of that letter refers to this same resume supplied to you by Dr. Gross?

A I believe it does.

Q Now, if you will refer to folder D-1 --

MR. FALLON: Are we through with these now?

MR. DODDS: Yes.

MR. FALLON: D-1, what document?

MR. DODDS: The first is, I believe, a letter dated March 2, 1942. I believe it's 267 or 266, March 2, 1942, from the Research Corporation to

Dr. Atanasoff.

MR. FALLON: 267.

BY MR. DODDS:

Q And then would you refer to the document which I believe is 266, your letter of April 9, 1942, to Research Corporation.

MR. FALLON: What is the question?

BY MR. DODDS:

Q Are you familiar with them? The question, is document 268 the report requested by Research Corporation in the letter of March 2, Exhibit 267?

A Well, doesn't look like it, to tell you the truth. I am not sure. I am unsure.

Q Well, do you know of any other reports that were made to Research Corporation?

A Have you searched my files for other reports?

Q Yes, I have, Doctor.

A I would have to do it myself. This question in the form you put it to me did not occur to me and it doesn't look like -- it may be the report. It may be my only response. It was a very troublesome time, as you know.

Q I am sorry, and --

A And we were under great stress, and I was engaged in this work and engaged in classified work of severe type and it may have been the only response I made, or it may not have, I

really can't be quite sure. I wonder. It doesn't quite look like it, does it? That was a rhetorical question.

Q Let me ask you this. Do you know of any reports rendered to Research Corporation other than those of which copies are found in the files which you produced here?

A I don't know. I do not.

Q And to the best of your knowledge there -- strike that -- To the best of your knowledge, there would be copies of any reports which you made to Research Corporation in your files?

MR. FALLON: Do you want to have that question read back again?

THE WITNESS: I do.

MR. FALLON: Would you read the question back, Mr. Reporter?

(The question was read.)

MR. DODDS: Strike that.

BY MR. DODDS:

Q Do copies of reports which you made to Research corporation appear in your files?

A It's been my purpose in keeping files through the years to keep materials in my files. No effort has been made to exclude any material whatever of this type from my files. As far as I know, these files are complete. I cannot be sure they are complete because many years have elapsed and

these files have on occasion been handled by other people than myself. I believe that the files -- I have no knowledge of omissions from the files.

Q Thank you. Now, I believe it's in the same folder, I don't have the exhibit number, there is a letter from Research Corporation to Dr. Atanasoff dated July 10, 1942.

MR. FALLON: Number 275.

MR. DODDS: Thank you.

BY MR. DODDS:

Q You will note, Dr. Atanasoff, that the last paragraph states, "Insofar as Research Corporation is concerned, et cet. there is no objection to suspending operations until happier times."

Do you know whether operations on the computing machine at Ames were suspended at that time?

A They were not suspended at that time.

Q Now, in folder C-3 --

MR. HALLADAY: May we suspend for a minute while you are conferring?

MR. DODDS: Surely.

(Discussion off the record.)

MR. HALLADAY: All right. I am all set. Mr. Halvorson, who is in charge of these things, is away, his wife has had a baby and she is back in the hospital.

MR. DODDS: Do you want this on the record?

MR. HALLADAY: So that at the moment, I am not able to give you further advice on proper identification of that Davis exhibit, but we are still working on it.

MR. FALLON: Where do we go in Exhibit C-3?

BY MR. DODDS:

Q Exhibit 299, a letter dated December 22, 1942, from Mr. Trexler to Dr. Atanasoff. Just one question. The first sentence refers to "The green covered booklet which I received from you some while ago."

Was that a copy such as Exhibit 455 or 456?

A It was.

Q And do you know, do you recall when this document was given to Mr. Trexler?

A I do not recall. It may be in the record, but if it's not in the record, I don't know.

Q Now, will you refer to folder D-3.

MR. DODDS: Mr. Fallon, while you are there, maybe you will get C-3 again. I need to refer to that.

MR. FALLON: All right.

What documents?

BY MR. DODDS:

Q 331, a letter dated September 5, 1941, from Dr. Atanasoff to Mr. Allen of Remington Rand.

A Yes, sir.

Q My question is, on the first partial paragraph on page two, which reads, "This, however, has not prevented a member" -- excuse me. I will go back. Strike that.

"Your principal competitor in the field of tabulating equipment has a much more elaborate and, if possible, legally tight agreement which it requires those making disclosures to sign." Ellipsis. "This, however, has not prevented a member of their board from writing me at rather regular intervals suggesting that they are ready to investigat the merits of my ideas if I will sign their contract."

Now, my question is, Doctor, which was the principal competitor of Remington Rand to which you were referring in that sentence?

A That's not a hard question. I believe it was International Business Machines.

Q And who was the member of their board who was writing you at rather regular intervals?

A Well, the man there who was writing me and I presume I verified it at the time he's a member of the board, I cannot

verify of knowledge at the present moment, was Mr. Clement Ehret.

Q And I can assume that any, copies of any correspondence between yourself and Mr. Ehret are found in the files which you have produced, that is, any copies that are still in your possession?

A I believe this is true. To the best of my knowledge and belief, it is true.

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Q Then if you will refer to your folder C-3 which are the index that you furnished is indicated as including correspondence with Trexler and others, etcet., and would you review that folder only with respect to your correspondence with Mr. Trexler, and the question is when was the last time that you saw or read the various items of correspondence with Mr. Trexler of which there are copies in that folder?

MR. FALLON: So I understand the question, you are talking about if he has looked at that yesterday or something like that, you want that as the answer?

MR. DODDS: When was the last time that you looked at these documents other than when you merely identified them during this present deposition?

THE WITNESS: Now, you want me to be sure on this occasion I looked at every document in there, or suppose I looked at two documents?

BY MR. DODDS:

Q I would be satisfied with a general --

A Suppose now I said I imagine that within the last -- will you read the question again, please?

(The question was read.)

BY MR. DODDS:

Q I might amplify that by saying we are only interested generally, was it a month ago, a year ago or ten

years ago or more?

A Well, I don't know whether this will satisfy you or not, but I have certainly read it in the last year.

Q Is it to the best of your belief that you read each of those items of correspondence with Mr. Trexler within the last year prior to your deposition?

MR. FALLON: There might be a little bit of ambiguity here, Mr. Dodds, because the witness has already said that he is not sure whether he has looked at all of them or part of them. Reading connotes one thing. It may be that he is confused, or not completely conversant with the use of your term, "reading." Why don't you ask him what he did do in the course of the last year so far as he can recall relative to these, and he will be able to explain it in his own language.

BY MR. DODDS:

Q I adopt your counsel's suggestion. Will you answer that question?

A Well, I have pretty well been through this material. Now, as you go through it, you can't be sure that you verify every statement in every letter. I have no such memory of verifying every statement in every letter. I have had recourse to this file during the last year. I have had recourse to some of it within the last two months.

Q Doctor, I refer you to Exhibit DPX-1 which you

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identified yesterday, a letter from yourself to Mr. Trexler dated April 23, 1968. The second paragraph refers to the, "other case." What is the other case?

A Will you --

MR. FALLON: Do you know?

THE WITNESS: Well, I know some things to be sure. I know one or two minor things but I was just thinking, I wasn't sure what the case was.

BY MR. DODDS:

Q I am just asking the case which you meant when you used the language in that letter?

A Okay. Then I will have to do reference to be sure which case it was I meant. I do not know at the present moment so I do not know what the other case was.

Q I only have one copy of that. Well, let's back up. The second paragraph starts out, "This matter marches forward." Now, what was, "this matter"?

A Well, now, it refers -- I think I can discover if I can -- if you will show me your letter, your letter to me of April 6. Now, I do not have that easily at hand and if you show me that I believe I can commence to reconstruct the matter of that.

Q I don't have that letter, but I can tell you what was in it. I wrote you asking permission to talk to Mr. Trexler about any -- about his files involving your machine.

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I don't have a copy of the letter. That was the subject matter.

A In what --

Q That was written in the Control Data case?

A Then the other case was the case being heard here.

Q And, "this matter," refers to the Control Data case?

A I presume this is true. Yes. That would seem logical.

Q Did you discuss the subject matter referred to in this letter with anyone else?

A I don't believe so.

Q One final question. The second paragraph you state, "The date of the first hearing is not settled, but we believe it may be this summer." Who is the "we" to whom you refer?

A I am not sure.

Q Well, what is your best belief?

A This is an editorial "we", I would suggest. I sometimes resort to this, I am sorry. It may not be editorial, I am not sure.

MR. DODDS: Mr. Halladay, I gather it is your preference to defer talking about the Davis Deposition Exhibit until you get a positive identification I believe that number is right but I just can't guarantee

it.

MR. HALLADAY: Well, to avoid any delay or interference with the order that you like to proceed in, if you want to go forward with it now, may it be understood we will provisionally refer to it as Davis Deposition Exhibit 30, and that if it develops that is inaccurate we can agree the reporter may correct the record accordingly because it is merely a matter of numerical identification?

MR. DODDS: That is agreeable. Thank you.

MR. HALLADAY: The Davis transcript hasn't arrived.

MR. DODDS: I didn't think I had mine either.

MR. HALLADAY: I think Mr. Halverson's notes of what transpired at the time would be helpful but he unfortunately is at the hospital so we can't verify it. So let's proceed on the understanding I have stated if that is acceptable.

MR. DODDS: Yes.

MR. HALLADAY: Dr. Atanasoff, so you understand what we are doing between us here, we believe the document was formally marked as Davis Deposition Exhibit three 0, 30. In the event that it appears

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here it is in error as to that numerical identification, counsel have agreed we may physically correct the transcript to put the proper number in. And if you will have that in mind I assume that's acceptable to you also?

THE WITNESS: That is acceptable.

MR. HALLADAY: Is that all right with you, Mr. Fallon?

MR. FALLON: Correct. Before we do anything I want to hear Mr. Dodds' question.

MR. DODDS: My question was if Dr. Atanasoff would look at that and then I had a few questions with respect to it.

MR. FALLON: I think at this stage Mr. Dodds, perhaps, you might indicate what the questions are. Just examining this, it's 31 pages --

MR. DODDS: I am going to.

MR. FALLON: What is he to look for?

MR. DODDS: That's what I am coming to.

MR. FALLON: All right.

MR. DODDS: I haven't come to it yet. I would like to ask the indulgence of a recess for a few minutes. I am advised there are some items in this Dr. Atanasoff's notebook which reflect on my projected questions on this document.

MR. HALLADAY: All right, it's agreeable with me.

(Recess taken.)

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MR. HALLADAY: All right. I am ready.

MR. DODDS: First, I will state on the record that on closer inspection, I find the reporter's identification of the document which I have previously indicated as Davis Deposition Exhibit 30 is correct.

BY MR. DODDS:

Q Dr. Atanasoff, would you refer to these pages, and maybe you would like to make a note, one, three, four, five, six, ten-sixteen of the green booklet, 455, and referred to corresponding pages in the exhibit 30 and confirm whether or not there is a different lineation on those pages?

MR. FALLON: What do you mean by lineation?

MR. DODDS: That the line numbers don't correspond.

THE WITNESS: Let's see. What was the first page?

BY MR. DODDS:

Q Page one.

A It does not correspond on page one.

Q All right. Is the next one three?

MR. HALLADAY: You are becoming sort of sotto voce here, Dr. Atanasoff, in answering the

questions. Please speak up as normally as you can.

THE WITNESS: It does not correspond on three. It does not correspond on four.

BY MR. DODDS:

Q Excuse me a second. Do you want your microphone in operation?

A It probably would help. Thank you. It does not correspond on five. It does not correspond on six. It does not correspond on ten. It does not correspond on eleven. It does not correspond on twelve. It does not correspond on thirteen. It does not correspond on fourteen.

BY MR. DODDS:

Q Now you will have -- I was coming to it in the next question, but at this point the page numbering is changed because in the green booklet the pages with the figured numbers are numbered, while in the Deposition Exhibit 30 the pages with the figured numbers are not numbered, --

A Thank you for your assistance.

Q -- so you will have to correct the pages at that point. Fifteen corresponds -- I am sorry -- page sixteen in the green booklet does not correspond to page fifteen in the copy supplied.

MR. FALLON: Insofar as lineation is concerned?

THE WITNESS: Insofar as lineation

is concerned.

MR. FALLON: That's it.

MR. DODDS: That's it.

MR. FALLON: Yes.

BY MR. DODDS:

Q The next question has been partially anticipated. Will you confirm this in the green booklet the pages following -- page fifteen and following are different than in Exhibit 30 because of the numbering of the pages with the figures on them.

A I observe that, Mr. Dodds. That is correct.

Q Now, will you refer to page six of the green booklet and also of the other?

MR. HALLADAY: In each instance, is the green booklet being referred to Exhibit 455?

MR. DODDS: That is correct. I will refer to it in that respect.

BY MR. DODDS:

Q Now, in the paragraph beginning in the middle of that page, I believe, in Exhibit 455, the words "of course" have been stricken out?

A That seems to be the case.

Q And on page --

MR. FALLON: Well, this assumes that DDX-30 came into existence before --

MR. DODDS: Wait just a minute,

Mr. Fallon. Let's don't talk about when these came into existence. That's a very critical point which I want to discuss later. I just want the difference between the two.

MR. FALLON: All right. There is a difference. Whether they were stricken or added is an assumption.

MR. DODDS: All right. I think that is correct.

BY MR. DODDS:

Q So that in 455 the words in the first line of the first full paragraph "of course" do not appear, while they do appear in Exhibit 30, is that correct?

A That is correct.

Q Now, will you turn to page 14, please?

A All right.

Q In the last paragraph, line three in Exhibit 30, there appear the words "In the direction of motion", which I believe do not appear in Exhibit 455, is that correct?

A That is correct.

Q And coming to page 23 of 455, page 21 in Exhibit 30, in the penultimate line our friendly word "punching" has been corrected, has been correctly spelled in Exhibit 30 and incorrectly spelled in 455, is that correct?

MR. FALLON: Hold it a minute. You

are referring to page 21?

MR. DODDS: Page 21 -- page 23, I believe it is, in -- 21 -- I am sorry --

MR. FALLON: Twenty-one of 455, where is the --

MR. DODDS: I think it's page 19, page 19 of 455 and 21 of --

MR. HALLADAY: Excuse me. I started out with my reference to page 23 or 455, 21 of Exhibit 30. Have we changed the pagination?

MR. DODDS: It is confusing. I think it is page 19 of 455.

MR. FALLON: No . It's page 21 of 455 and page 19 of DDX-30.

MR. DODDS: All right.

BY MR. DODDS:

Q At any rate, the word "punching" is correctly spelled in Exhibit DDX-30 and incorrectly spelled in 455, is that correct?

A That is correct.

Q Now, if you will refer, still on Exhibit 455, page 24 -- I am sorry, there is only one copy. Could I look at that? In the last paragraph, and referring particularly to the last line on the page, I believe you will find the beginning of the line in the two documents is different, is

that correct?

MR. HALLADAY: Are we comparing page 24 of 455 with --

THE WITNESS: With 22 of 30.

MR. HALLADAY: Thank you.

THE WITNESS: It is different.

BY MR. DODDS:

Q Then will you refer to page 25 of 455 and page 23 of Exhibit 30? May I see that a second? Excuse me. Will you strike that.

Refer to page 26 in 455 and 24 in Exhibit 30, and taking, for example, the last line of the first full paragraph, I believe the contents of the lines are different, is that correct?

A That's true. That is true, they are different.

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Q Then page 28 of 455 and page 26 of Exhibit 30, there is a certain difference in beginning and ending of lines as represented by the last line, is there not?

A There is a difference.

Q Now, will you refer to Fig. 2 which in 455 is page 17, I believe, and in Exhibit 30 follows page --

A 15.

MR. FALLON: No, 18, probably.

THE WITNESS: Follows 15.

MR. FALLON: Right.

MR. DODDS: Follows page what?

MR. FALLON: 15.

BY MR. DODDS:

Q 15. In the lower right-hand portion of Fig. 2, I find two terminals labeled Cap. A and Cap. C, is that correct?

A Yes.

MR. FALLON: You are speaking with reference to the one in 455?

MR. DODDS: In 455.

BY MR. DODDS:

Q Now, those reference letters are not found in Exhibit 30, are they?

A They are, but faintly.

Q And not inked letters?

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A Not inked the same. Probably in pencil, probably in pencil, but they are the same letters there.

Q Yes. Probably in pencil?

A Yes.

Q Now, the same applies, also refer to the designation of the supply voltages, plus 120V and minus 120V?

A Right. Right you are.

Q I didn't finish. They appear in 455 but do not appear in DX30, is that correct?

A Well, we have got minus 120 volts out there in the proper position and it is evidently written in pencil.

Q In the margin, is that right?

A In the margin. Right.

Q Do you have any information as to who may have applied those legends in pencil on DX30?

A I do not.

Q All right. Now, Dr. Atanasoff, I believe you testified that Exhibits 455 and 456 were prepared in August, 1940, is that correct?

A That is correct. Yes.

Q Do you know when the version Exhibit 30 was typed and prepared?

A I have no reason to supposed it was not typed and prepared during the same month.

Q Do you have any definite recollection that it was?

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A Do you mean do I isolate it in the typing from the rest of the documents, is that your question, really?

Q The question is that DX30 has a number of differences which we have just gone through with respect to 455?

A Right.

Q And the question is, do you know when the version represented by Exhibit 30 was typed and prepared?

A I have no knowledge of any preparation of these documents taking place except in the sequence which I have described in August of 1940.

Q But your previous description of the preparation of this manuscript, you referred to Exhibits 455 and 456 and did not refer to the version represented by Exhibit 30, so my question is do you have at this time, do you have any knowledge when the manuscript represented by Exhibit 30 was typed and presumably bound?

A It is clear that the witness cannot state that he remembers the typing of each individual copy of this. He, however, remembers the scenery and the operation during which these documents were prepared, and as far as he has any memory or belief, they were all prepared consecutively during the same period of time which may have begun in July and ended some time in August of 1940.

Q Well, then, Dr. Atanasoff, it has been established, I ask you to accept for the present it's been established

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by the deposition of Plaintiff's witness, Mr. Davis, that DX30 was the copy which Research Corporation received rather than a copy of 455 or 456. Now, I would like to ask you which of these versions were sent to the other gentlemen, for example, to Mr. Weaver and to Dr. Stewart?

A There are no records in my possession showing which of these versions were sent to the gentlemen in question. Obviously memory will not suffice in a matter of this kind, but I do remember that there was a very active and complete preparation of this document during that period and that no further time was this document modified, changed or otherwise disturbed.

Q And so far as your recollection goes, the copies of the manuscript sent to Mr. Weaver and Dr. Stewart might have been either of the version of 455, Exhibit 455, or the version of Exhibit 30 which went to Research Corporation?

A I believe this is true.

Q And now coming, shifting the scene a moment, I believe you said that you had shown a copy of this manuscript to Mr. Mauchly during his visit. Do you have any basis for saying which one, which version of the manuscript was shown to Mr. Mauchly, allegedly shown to Mr. Mauchly?

A Well, there were only a few copies. These were bound copies. They were in my personal possession, and I suspect, although I cannot prove, that Dr. Mauchly saw one of

the copies that's under my hand at the present moment. That means 455 or 456.

Q Do you have any basis for saying that --

A There was -- I should add for the sake of completeness, I remember that I previously had three copies in my possession and one of these was loaned to an attorney and was not returned although the understanding is that it would be returned.

Q Well, have you any basis for suggesting that particularly one of the booklets was shown to, that you assert was shown to Dr. Mauchly was one version rather than the other if they were all produced at the same time?

A As a matter of fact, I have, my memory is, as I have previously declared, that there were two final typings of this thing and the two final typings, and the two final typings. Now, that does not mean that there were other preliminary copies, there were other preliminary copies, and you have them in your possession and we all agree and know about them, but there were two final typings, and the copies that were intended for distribution were from those sources. Now, as I sit here, of course, I don't know what happened, Mr. Dodds. You can see if the differences in these three copies have significance or not. This is my belief at the moment, that there were two final typings of this , and that there were other preliminary typings and by some machination,

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a preliminary copy must have been sent to Mr. Davis, if that is a copy which he received.

Now, on the other hand, I cannot certify there were not two copies sent to Mr. Davis. I can't be sure about that because he was considered a very -- I knew that he intended to submit it to other parties, and he was a very principal receiver of this document, and so it may well have been two copies were sent, but this just confuses the issue. I still assert my best memory and belief is as I previously stated.

Q Dr. Atanasoff, at the time that you were seeking a grant to support your work from Research Corporation, does it seem reasonable you would have sent Mr. Poillon in November, three months after these pamphlets were prepared, a preliminary set rather than a final typing?

MR. FALLON: I think the question is argumentative here. Ask the witness what he recalls sending Dr. Poillon. I mean answer the question in that sense rather than the reasonableness of it.

THE WITNESS: May I answer the question as stated?

MR. FALLON: All right.

THE WITNESS: Will you withdraw your objections?

MR. FALLON: Yes.

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THE WITNESS: It certainly does not seem reasonable. I agree with counsel, but you have had office help and I have had office help and we know that things like this sometimes happen.

BY MR. DODDS:

Q Well, let me ask you, do you consider this Exhibit 30 not a final typing?

A I would rather before making a firm assertion of that kind, I would rather study the document in detail overnight or something of the kind. I have not had -- I have had no previously access to that document. I knew it existed but I have had no previous access to that document so I -- I haven't had a chance to study it and I am, of course, surprised at the differentials which you have demonstrated which are clear and true. I have no question of, I am turning this over in my mind to see how it relates to my memories. I have described what that relation may be. It may not be valid.

Q This photocopy does notshow it. I represent to you that it was contained in a bound green folder as were the others and I believe the testimony of Mr. Davis brings that out.

A Thank you for that.

Q You have no reason to believe that is what you call a preliminary typing, is that correct?

A I have no reason either to believe or not to believe

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it was a preliminary copy.

Q To be consistent with your earlier testimony, this Exhibit 30 must have either been a preliminary version or there must have been three final typing versions in August, 1940, is that correct?

A I would agree with that.

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Q Still on the green booklet Exhibit 455, you indicated in your earlier testimony that you considered claim 100 of the ENIAC patent to apply to your computing machine. Do you also consider it to apply to Exhibit 455, the disclosure Exhibit 455?

A Well, I would like to have it, my testimony -- I stated yesterday that one claim that was firm in my mind was claim 100 of the ENIAC patent. The contents of that I was aware of. I do not remember any claim that it applied to my work, but I may have so stated because I will now state that I do believe it applies to my work.

Q And do you believe -- I am sorry?

A Now do I believe it applies to 455?

Q That's the question.

A I will take a little reference.

Q All right. You want to look at claim 100?

MR. FALLON: Yes.

THE WITNESS: Yes. It would be all right to do that, but I don't think I need to.

MR. FALLON: No. Let's have it.

THE WITNESS: I will do it without it.

MR. FALLON: I want to see it.

THE WITNESS: You can see it but I won't see it.

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BY MR. DODDS:

Q Are you ready to answer the question, Dr. Atanasoff?

A Will you repeat the question?

MR. DODDS: Or was there a question?

THE WITNESS: That's what I would like to know. Do you have one in mind, sir?

BY MR. DODDS:

Q I think you did say, did you not, that you considered claim 100 to apply to the disclosures of the Exhibit 455 booklet, is that correct?

A I said it applied to my work.

Q Yes.

A I swore to that.

Q Yes.

A Now, I don't think I said it yesterday, I said it today.

Q Yes.

A So I am glad to say it today. I will now state it applies to the booklet.

Q And would you designate any particular portions of the booklet which you think support this claim 100 of the ENIAC patent?

A The portion of the booklet is on page 30 of Volume -- of booklet number 455. It is in the paragraph at the top of the page.

Q Are there any other portions of the booklet to which you would want to refer?

A For this relationship?

Q In the application of claim 100?

A No..

MR. HALLADAY: Would you read me the last question and answer, please?

(The question and answer were read.)

BY MR. DODDS:

Q I think when we were talking on this subject yesterday, Doctor, you felt present assurrance only with respect to claim 100 of the ENIAC patent, of course, reserving the right to certain other claims?

A I certainly reserve the right, sir.

Q In the meantime, are there any other claims of the ENIAC patent on which you feel assurance?

A The statement I made yesterday was, I believe as follows -- perhaps we should have -- I don't know whether it's easy to do, to have the record read. Is it permissible for me to ask the record be read?

Q We can. The only question is do you have anything to add to it?

A Well, --

MR. FALLON: Not at this time.

THE WITNESS: This places a burden on

me. I can just state the facts and as far as adding additions, of course, would be glad to make use of the records as counsel wants to do in certain circumstances and not attempt to use memory solely for such purposes. However, I will state as follows:

MR. FALLON: Nothing more at this time. That's all.

BY MR. DODDS:

Q We will look that up and we maybe can go on and come back.

A If you will look it up I will make the addition.

Q Dr. Atanasoff, have you ever seen any written analysis or comparison of the claims of the ENIAC patent with respect to either your machine or the disclosure of the manuscripts such as Exhibit 455?

A I have not.

Q I notice in your log book there is a reference to such a comparison. Is this something you have not seen, nonetheless?

A Will you give me the reference and let me look at it so I can see?

Q Yes. I will read it into the record so we are clear. "Since 1966 memorandum from C. G. Call to D. Allegretti comparison of ABC with the ENIAC patent claims." I might ask a preliminary question. ABC means Atanasoff

Berry computer as described in booklet 455, is it not?

A It does.

Q And the question is, does that refresh your recollection as to whether you have seen such a --

A I have not seen such a document.

Q Now, would you refer to Exhibit 455 figure one on page 15 and there is a switch at the upper left-hand corner labeled S-3?

A Yes.

Q Now, I have a fairly involved question so I will read it first and then maybe ask the reporter to read it back to you slowly. Referring to this particular figure to the disclosure of 455, I would like you to describe the intended duty cycle of the switch S-3 during the placing of a number on the abacus KA, placing a number on the abacus CA, adding the contents of abacus CA to the abacus of KA and the regeneration of the information on abacus KA. That's pretty involved, but the duty cycle of the switch, at what portions of the cycle during this operation is the switch opened and closed?

A I request that counsel alter his question in one small regard to make it easier to answer. I request that the counsel instead of saying to add the abacus CA to the abacus KA, and that he reverse the order, add the abacus KA to the abacus CA.

W-8-1

Q I accept it.

A Now would you read the first portion, please, as corrected?

(The question was read.)

MR. DODDS: Then would you read the amendment requested by the witness?

(The amendment was read.)

THE WITNESS: I suppose I am going to have to write that question down before I can answer it in the order in which you asked it. I could ask it in some other order. You spoke of duty cycles and switch S3, did you?

Q Yes.

A Now, S3 is the switch that's operated by the one cycle. It's a switch actuated by one cycle mechanism which previously has been described. Do I need to describe that again?

Q No.

A Now, that means that that is the switch that changes its position during the vacant portion of the cycle and changes back to its original position during the next vacant portion of the cycle.

Will you object too much if I make a mistake in the order in which I answer these questions?

Q No, that's all right.

A Because I can't remember the order that you have them in.

Q Yes.

A Suppose the switch S3 is turned to the right or its uppermost position and is there during the course of the discussion, affixed there during the course of the discussion. During this period, KA will be regenerated by the agency of tubes two two, two three and T one. You will -- if I may interpose, you will have to make the correction in the upper right-hand corner of the diagram that we have discussed previously.

Q Yes.

A And CA is regenerated through the agency of the add-subtract mechanism, period. That is the regeneration portion.

Now, if the switch S3 -- in a way, Mr. Dodds, the way I am answering this, this is not going to be responsive, but please allow me to do it this way.

Q Surely.

A And then criticise the response and I will attempt to correct it to make it responsive.

Q Surely.

A Suppose that the switch S3 is dropped to the left-hand position.

Q Yes.

3

A During the vacant portion of a cycle and it remains there for one cycle and then it's returned to the uppermost position, the results will be as follows: The contents of CA will be transferred to KA. You didn't ask me that question but that's what happens. That is the agency of switch S3.

If you wish me to describe how addition is performed, I will have to go outside of the agency of switch S3.

Q No, that is not necessary. We will just assume that the addition is performed. I am just interested in, during these various phases, various sequence of operations, the position of S3.

A The purpose of that switch S3, it has only one purpose which I have described to you, and that is to drop to its left-hand position, during which the contents of CA are transferred to KA. That is the purpose of switch S3.

Q Otherwise it remains permanently --

A In the uppermost position.

Q In the uppermost position?

A That is correct.

Q Now, that's fully responsive. Thank you.

Now, just one question. Could you point out to me where in 455 that operation is described?

A I don't know. That would take me a long time. I

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would like to have it overnight to search for that. That's a long thing. Perhaps that isn't described there, I don't know.

Q Okay. We will just --

A You know, it could have been left out, I don't know. I think all I could do is commend counsel for the defense on their assiduous study.

Q One small point I think I neglected. You can identify the folder which is the reporter's mark DPX4, can you not, as the chronological list which has been in your possession?

A I can.

Q Since, Dr. Atanasoff, you said that you had not seen this document which I have previously identified, a memorandum from Mr. Call to Mr. Allegretti comparing the claims of the ENIAC patent to the ABC, that information in this list apparently didn't come from you or your files, then did it?

A It did not.

Q So the list includes, it's really a composite, is it not, of information from your files and information from the files of counsel for plaintiff?

A It's clear -- I forgot about those last pages. There's some recent additions there. As far as I know, the main part came from my files, but the correction certainly stands.

Q Would you refer to folder E-2, document 404? This is a copy , a carbon copy of a letter which I think you previously identified. The date at the top, I assume that is August, 1966, is it?

A That means August of 1966, and I evidently didn't have the day and so I didn't put it down.

Q Yes. Now, it appears from this letter that Mr. Griffen had requested a copy of the booklet, which I assume was Exhibit 455, isn't that correct?

A I would judge so, yes.

Q And you referred him to Mr. Trexler for a copy of that booklet in this letter?

A I don't think so. I don't think that is the interpretation, as I remember it.

Q The first sentence reads, "I approve of your plan to get a copy of the booklet."

A That was his plan. That wasn't my plan.

Q All right. I stand corrected. You didn't at that offer to send Mr. Griffen one of the copies of the booklet which was in your possession?

A I never do that.

Q Nor to send him a copy of one of the booklets in your possession?

A Well, I would not think of sending one of the copies in my possesion. I have on occasion done this, but that is

my plan and fixed plan. Now, he wrote to me and asked me, I believe, and I don't see the letter here, but my memory is that he wrote me and asked me if I would give him permission to get a copy from Mr. Trexler, and I said, "Yes, go ahead," and this is the letter saying yes.

Q Is there any particular reason why you did not offer to supply Mr. Griffen a photocopy of one of your copies of the booklet?

A Well, if you mean that I didn't have those copies in my possession at that time, the answer is, that is not the reason, I assure you. There is some other reason we must search for, and I believe the reason is that I didn't want to be bothered with it.

Q Would you refer to your folder B-3, Document 27. What I am referring to, I think there was a little confusion between Nos. 27 and 28, and I am referring to the one which actually bears both numbers and 8 is crossed out.

A I think that 27 is the correct name for this.

Q And I believe you testified at page 223 of the transcript that this was a diagram of a 9 triode logic circuit devised by Mr. ~~Barry~~ B in the fall of 1941. Have I correctly stated it?

A It's mostly correct. I am trying to verify the fall of 1941. Did I say that at that time?

Q The transcript shows that, page 223. Incidentally,

the date is not significant.

A All right. Just omit that, and I will testify, I will agree.

Q That is subject to correction as to the date.

A Yes.

Q My question was, do you know whether or not the circuit shown on this Exhibit 27 was used in any equipment at any time?

A Yes, I know.

Q And on what equipment was it used?

A It was not used, I am sorry.

8/2/1
WS KL

Q I think, I am sure you testified you left Ames, Iowa, in September of 1942?

A I did.

Q Do you know whether or not any further work was done on the computing machine at ISC after you left?

A Again, I am up against the legalisms of the situation. I believe that --

Q I am just speaking of work in a practical sense. Was anybody working on the machine after you left?

A This is what I am trying to ascertain to be very exact in my statement to you, sir. Mr. Frisell was there at the time and I would not be much surprised if he did some work after I left, but it was a minor, I would say it was probably a minor amount of work, to give this answer a little perspective.

Q You don't have any present recollection of any particular changes in the machine that were made after you left?

A I do not.

Q Now, the title of booklet 455 is, and I quote, "Computing Machine For the Solution of Large Systems of Linear Algebraic Equations," is that correct?

A That is correct.

Q Was the computing machine ever operated to solve any given set of simultaneous linear equations?

A It was not.

Q With whom have you discussed this 1941, I will call it for brevity the ISC computing machine?

A We call it the ABC.

Q All right. I will use your term. With whom have you discussed the ABC computing machine within the last three years?

A Well --

MR. FALLON: That includes even casual references? Is that what you are talking about?

BY MR. DODDS:

Q I am not referring to someone you may have just said, had casual reference to it without any discussion of the substance. I am talking about only any conversations and discussions involving something more than just a mention of the item.

MR. FALLON: Well, I only ask that question for clarification, Mr. Dodds, because it's apparent that at least since May of 1967, Dr. Atanasoff has been highly involved in this on behalf of at least two corporations, and now latterly with Iowa State University Research Foundation. He has had people with whom he has probably discussed this matter outside of those organizations, so with the caveat that the list may be incomplete, do the best you can.

BY MR. DODDS:

Q That's all that is requested.

A I would point out, let the list contain the following groups: Counsel for Control Data, counsel for Honeywell, counsel for Iowa State University, Mr. Trexler, Mr. Bradley, and a patent attorney in Chicago, I think we can get his initials for you; this discussion was rather casual and my discussions with Trexler were also casual. I am not even sure if I should add them. The technical man who assisted me on the machine.

Q Anyone at Iowa State, Dr. Legvold?

A Oh, thank you. I believe that we could dignify my discussions with Legvold as of some substance.

Q Mr. Orr?

A I doubt if they would rise to such classification.

Q Anyone else at Iowa State?

A I am thinking of one man by the name of Robert, in the computing division by the name of -- Bob Stewart

Q Perhaps his name isn't important. It's someone in the computing section at Iowa State University?

A Yes. There is a gentleman there rather on the technical side, and my discussions with him, I am even in doubt as to whether they rise to, if you are talking about the precise, you know, intricacies of the computing nature, I am not even sure I have gone into them with Sam Legvold. You

said during what period?

Q The last three years.

A I am not sure I even did that with Mr. Legvold the last three years.

Q And the question was not, however, confined to the technical details of the machine.

A Yes.

Q How about counsel for General Electric?

A Counsel for General Electric, please add them, and that implies three men.

Q The same three you have mentioned before?

A Yes, it does.

Q And how about Mrs. Berry?

A Well, I have certainly discussed the matter with Mrs. Berry. Thank you, sir.

E-9-1

Q Can you think of any others?

A Well, a man by the name of Bob Mather, oh, what is the University in California -- what is the University?

MR. FALLON: Berkeley?

THE WITNESS: Berkeley. Thank you. And a man by the name of Jim Elder at Berkeley, and a man -- of course, Mr. Frisell.

BY MR. DODDS:

Q At Ann Arbor?

A He is at Michigan, Holland, Michigan. I believe it's Holland, Michigan. And Mr. Gert Weisman of Chicago.

MR. FALLON: Mr. Dodds, if I may suggest, if you have any other categories of people to refresh the witness' recollection --

THE WITNESS: It would be useful.

MR. DODDS: No, I don't. That will probably suffice and we will leave it this way, that if during your deposition other names occur to you, perhaps you will let us know?

THE WITNESS: Yes. I am having a little trouble just getting at these this way.

BY MR. DODDS:

Q Yes. You refer to the ISC machine as the ABC computer. Will you state for the record what that refers to?

A Well, somebody else first used this term and Mr. Berry being dead, I felt I rather liked the idea of including Mr. Berry's name in the machine so I just called it the Atanasoff-Berry Computer. It refers to the machine under -- the last major machine under construction at the Iowa State University.

Q That being, ABC being the acronym for the Atanasoff-Berry computer?

A Right.

Q Do you recall when you first started applying that designation to the computer, ABC?

A Oh, within the last couple of years. Well, let's say since the current litigation has been in question because I never had any necessity of naming it previous to that, but it just kept having to name it over and over again and became clear I'd better separate that from the other entities here.

Q Now, coming back to, briefly to Dr. Mauchly's visit to you in 1941, I wonder if we could see the chart, Exhibit V here, the perspective view of the computer.

A Mr. Dodds, may we go off the record a moment?

MR. DODDS: Surely, if it is agreeable with Mr. Halladay.

MR. HALLADAY: Sure.

(Short recess taken.)

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MR. FALLON: Exhibit V is on the blackboard.

BY MR. DODDS:

Q One question. Do you notice the panel, I believe you called it panel, the panel called, "Thyratron punching circuit"?

A Yes.

Q Was that on the machine at the time of Dr. Mauchly's visit in 1941?

A I believe it was not.

Q You were naming exceptions the other day of changes --

A I didn't put that one on. I believe I was in error with regard to that. I somehow, as I glanced over the picture, I slipped on that.

Q In this machine, Exhibit V, was it possible to run the motor and drive the drums without having the electronic circuits energized?

A It was.

Q Now, let's come back to the cold night when the flash of genius struck you.

MR. FALLON: Is that a fair characterization of previous record?

MR. DODDS: I believe he used the language.

THE WITNESS: I didn't use flash of genius, I guarantee you, and if you can find that in my statement. There is reason for it too, Mr. Dodds, and that is that I don't really, I don't really much believe in genius. I believe in ditch digging and a lot of hard work.

BY MR. DODDS:

Q You believe with Edison that an invention is 90 percent perspiration and ten percent inspiration?

A Yes. Some inspiration might have occurred on that evening but --

Q At any rate, referring to that evening, I think you know the evening to which I refer?

A I do that, yes.

Q Do you recall at what time you left your office in the Physics Building?

A Oh, not exactly. I would suppose it was in the neighborhood of 7:00 o'clock in the evening.

Q And do you recall at what time you returned home?

A No, I don't. But it was well towards daylight, if not daylight, when I got back. I spent the night at it.

Q When you described your outward drive at a relatively high speed to these locations, I don't recall now, I believe it was to a bar that -- do you recall where that was?

A That was across -- you know, I don't know exactly. It was across the river.

Q Which river?

A The Mississippi River. At the tri-cities there, you know, what are the names of these tri-cities? Someone will have to supplement my memory, but it's Rock Island, isn't Rock Island one of them?

MR. FALLON: Yes.

BY MR. DODDS:

Q Well, that I don't think is material.

A I drove across the river and I remembered that the distance at 189 miles, as a matter of fact.

Q Did you return by the same route that you went?

A As far as I remember I did. Yes.

Q But at somewhat slower speed?

A Yes. Somewhat slower speed. I wouldn't say too much slower because I was -- I have a rather bad reputation in this regard, Mr. Dodds, and I don't intend to drive fast, but it's something about me just drives me fast.

Q Do you consider a binary counter as an important component of a base two computer?

A I would ask counsel to define binary counter?

Q Well, is the term sometimes used synonymously with a scale of two device, is that term familiar to you?

A It certainly is, and it's precise as far as my

own general knowledge of the subject goes, quite precise. Not exactly precise but it's close. Now, will you repeat the question in those terms?

Q Well, in considering the term binary counter as it is frequently used synonymously with scale of two counter, is that an important component of a base two computer?

A I am still a bit of a diehard. I would like to ask if you are referring to the types of circuits which have flip-flops in them which have vacuum tubes so related that they have two stable positions and as a result of the concatenation of these devices they become a scale of two counter, is that the device? I am trying to get --

9/2/1
EA KL

Q I think that is it -- I am sorry?

A I am trying to get it a bit more precisely if you don't mind.

Q My question was more generic than that, that is a species of what I am talking, one type of scale of two counter, I think there are other types, I was thinking only in terms of electronic devices?

A Mr. Dodds, I do not wish to argue with counsel, but I may make one remark, that if you do not mean that or substantially that then we can take any binary computing machine and it is a binary counter, and so all computing machines are binary counters.

Q I limited it to electronic devices?

A All right. Limit it to electronic and the remark is still true as far as electronic computing machines go.

Q Yes. So that in that broad sense, a binary counter is an essential component of any electronic computer?

A Any -- I didn't say exactly that. I said as follows, any computing machine, any scale of two computing machine will function as a binary counter.

Q And any computing machine, of course, comprises a great many components and some of those components must be binary counters, is that correct?

A I didn't say --

Q I know you didn't say that, I am asking you?

A Now, I already told you -- pardon me, I didn't mean to use that language with counsel. May I use a more courteous discourse. That was a professorial remark. I was teaching a bit too hard in that instance. I have already told you -- pardon me. I have already stated that if you take any base two computing machine it will function as a binary counter. So then it is mere tautology to state that any computing machine has a binary counter in it, but this is when you employ the broad concept which you -- I am not sure whether this is what you have in mind or not. You mean, did you mean to question me on mere tautology or did you expect I would give more substance to my answer than that?

Q Well, I was trying to differentiate between a composite computer which is an elaborate affair and has many, many parts to it and is, you say, an over-all binary counter, but it also must have within itself many sub components which are themselves binary counters, isn't that correct?

A That commences to take on a dubious nature, that remark. I cannot answer that yes with certainty.

Q Well, would you answer it with the necessary qualifications you think appropriate?

A Suppose you restrict yourself to the vacuum tube systems which have two states which is a well-known type of binary counter and which --

Q Right.

A All right. Then I would say a computing machine does not necessarily have to have these devices within it.

Q I am sorry, does or doesn't?

A Does not have to have these devices within it.

Q Do you recall, Doctor, what make and type of condensers were used in the ABC machine?

A I do.

Q Will you state?

A I just happen to. I can't give you answers on everything but these were manufactured by the John E. Fast and Company of Chicago.

Q What type were they?

A They were paper condensers.

Q Did they have a type number?

A I can't give you that.

Q Would you refer to the documents in folder G-1 on condensers and see if you can identify from that?

MR. FALLON: Any particular document?

MR. DODDS: Frankly no because I didn't know what it was. I didn't know what to look for.

THE WITNESS: Well, here is a quotation from them. I turn to it immediately but no type number is given.

E-9-3

MR. HALLADAY: Number, please?

THE WITNESS: 617 is the reference in question. 618 also applies to the same.

BY MR. DODDS:

Q Well, you don't recall any type designation of these condensers?

A May I remark that if you examine 617, it states facts known to me to be true. We did not buy a finished product. We bought the bare innards, the inner parts of the condenser, and that may be the reason there are no type numbers applied to this item. You notice they were 600 volts DC. You notice that it is stated there that they have internal resistances one to four times ten to twelve ohms.

Q Do you recall what the fall time of these condensers was?

A Well, what we did instead of measure it, you know,--

Q Do you remember what it was?

A Several minutes as tested in our laboratory.

Q Now, would you complete what you started to say when I interrupted, how you measured this fall time?

A Of course, I was about to tell you that, you know. I wanted to be a bit precise before I stated the fall time. It was customary in our laboratory to a sufficient degree of accuracy and we did not need this fall time with any degree of accuracy, and we just measured the time necessary for the

voltage to fall to one-half instead of one over eight of its value. I was about to make that proviso in the statement of fall time.

Q Yes.

A Now, the fall time varied and it varied with a lot of other little things, but it was, as far as I am aware, I don't think that we ever measured a condenser at that period where the fall time was not at least a minute.

10/1
WS KL

Q Well, to be just a little bit more specific, how did you measure this? Did you attach a voltmeter to it and let it stay or did you apply it to it periodically or how did you measure this fall time?

A We had very, we had vacuum tubes operating under very high internal impedance. They were charged on the grids of these vacuum tubes, and the vacuum tubes, we were continually reading the voltage with a very high impedance vacuum tube voltmeter. That distinctly answers your question.

Q That answers my question.

A Yes.

Q So that the value of the voltage on the condenser was continuously observable?

A (Witness nods head affirmatively.) I remember distinctly we went to some difficulty to get that vacuum tube voltmeter. We constructed it ourselves and there was a selection of tubes in getting that to operate satisfactorily.

Q If you will refer to Exhibit 600 in that same folder, you will notice that apparently quite a number of different brands of condensers were measured and the time to fall to half value in some cases was as low as -- is that 250 micro micro seconds?

A I don't observe any 250 micro micro --

Q The fourth one.

A No. Those are, 250 micro mics. is the capacity of

the condenser.

Q Oh. The fall time, I am sorry, is on the left. Is the fall time --

A And those fall times are in seconds, and I remember distinctly, you know, we just picked up condensers around the laboratory to see how the thing is going to go and this is the result of a preliminary experiment which happened to be left in the folder.

Q Thank you.

MR. DODDS: Would this be a convenient time to adjourn for lunch, Mr. Halladay?

MR. HALLADAY: Agreeable with me.

(Whereupon an adjournment was taken until 1:30 o'clock p.m., December 5, 1968.)

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December 5, 1968,
1:40 o'clock P.M.

(Appearances as heretofore noted.)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

CROSS-EXAMINATION (CONTINUED)

MR. HALLADAY: Are we ready?

MR. DODDS: Ready.

BY MR. DODDS:

Q Dr. Atanasoff, I believe you testified that you first met Dr. Mauchly at a meeting of the Triple A, S in Philadelphia commencing, I believe, on December 26, 1940?

A I did not testify as to the date, I believe, but it's approximately that date, 1940, right.

Q Would you refer to the folder D-1, document 257?

A Yes, sir.

Q Does that refresh your recollection with respect to this?

A Well, it's quite right, yes.

Q Pardon?

A I say that is quite right, yes. I didn't have this in mind but --

Q It was actually a meeting of the American Physical

Society, is that right?

A No, it was a meeting of the Triple A, S, but it happens at these winter meetings of the Triple A, S, the American Physical Society meets simultaneously, so it's both.

Q I see.

A To be precise.

Q I see.

A But they are called meetings of the Triple A, S, usually. Of course, somebody might specify them otherwise.

MR. HALLADAY: What's the date of 257?

MR. DODDS: December 14, 1940.

THE WITNESS: If you care to look, you can go to the office of Triple A, S and you can find a program of this meeting and you can find Mauchly's name upon the program, I might add, and it's called Triple A, S.

BY MR. DODDS:

Q I believe counsel for the plaintiff asked you with reference to Mauchly Deposition Exhibit A-3. I can represent to you that the figure comprising the two neon tubes which you mentioned on the original is in red ink, but it doesn't show in the reproduction. Does that refresh your recollection at all as to whether you saw that on the occasion of your discussion with Dr. Mauchly, do you remember any such a

red ink drawing?

A No. I do not. I believe that this paper was handed to me and I put my name down. It may have been at the time I put my name down that there was nothing else on the sheet. This is not in my handwriting, I am almost sure. And that, and of course this is not in my handwriting, I am almost sure.

p.m.
12/1
/S KL

Q "This," what are you referring to?

A I am referring to this A sub-one, sine N theta plus B sub-one cosine N theta.

Q Do you recognize anything on the sheets other than your name which is in your handwriting or in your hand, I should say? Some of it isn't writing.

A Well, you see, I testified that the two letters in the square might have been in my handwriting. They are a bit too fragmentary to be quite sure, but, you know, my memories have a warm feeling for that form.

Q Any of the material on the other fold, opposite fold of this Exhibit A-3 in your hand?

A Yes, the "Goetz" seems to be in my handwriting, too, G-o-e-t-z, I guess it is. I don't know what it refers to.

Q Any of the curves or graphs appear to be in your hand?

A I have no belief that they are in my handwriting.

Q If I told you that Dr. Mauchly had identified the circuit including the two neon tubes as a binary counter, would you disagree with his characterization?

MR. HALLADAY: I object to counsel's statement of his belief.

MR. DODDS: I don't recall I said anything about believing. Dr. Mauchly stated that he considered the circuit including the two neon tubes to be

a binary counter circuit in his deposition. I am asking whether you agree or disagree with that characterization?

MR. HALLADAY: My point for the record is that I disagree with what you say Dr. Mauchly said.

MR. DODDS: Well, the record will speak for itself.

MR. FALLON: Well, then, in view of the fact there is a conflict between the attorneys for the parties here, as counsel for the witness, I think I have to request that you unload the question to the extent of saying, would the witness consider this representation to be a binary counter, if that is agreeable to you, and you can ask him that question.

BY MR. DODDS:

Q I will adopt that question. Will you answer that question, Doctor?

A That circuit will count when equipped with components of the proper characteristics.

Q and if it counts, it can only count, it's a stage of two counter?

A It will be a stage of two counter, right.

Q When Dr. Mauchly came to visit you in June, 1941, did you know before he came when he would be arriving?

A Almost exactly, I believe. I believe there is an

element in my letter that corresponds that shows on Friday he would be attending the meetings in Iowa City. It is only a matter of two or three hours drive from Iowa City to Ames, so I expected him to come Friday. I have testified, I believe, he came Friday evening. One reason I believe he came Friday evening is because I know he came in the evening. If he came Saturday, he had diddled around all day Saturday and then came in the evening, and I don't believe that is what happened. I believe he came Friday evening.

Q Did you tell Mrs. Atanasoff that he was expected?

A I did.

Q When did Dr. Mauchly leave Ames?

A I would guess on Thursday of the following week, but my memory is not precise on this matter.

Q Do you remember what time of the day he left?

A He left in the morning.

Q I would like to read one question and answer from the deposition of Mrs. Laura Atanasoff taken in Denver, Colorado, December 5, 1967, in the Control Data case in which, in response to a question from her counsel, and her answer --

MR. HALLADAY: Excuse me. Her counsel?

MR. DODDS: Her counsel and her answer, the question from her counsel and her answer -- I am sorry, counsel for Control Data, not Mrs. Atanasoff's.

MR. HALLADAY: What date?

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MR. DODDS: December 5, 1967, and this is page 28 of the transcript, line 25:

"Did you know whether or not there had been correspondence or telegrams exchanged between Dr. Atanasoff and Dr. Mauchly before the visit?

"Answer: I can't remember if there was, because when he appeared at our house, I know it was a surprise. I was unprepared."

Does that refresh your recollection in any respect?

THE WITNESS: It does not.

BY MR. DODDS:

Q Now, would you refer to folder B-10, Exhibit 84, 85.

Now, the fourth paragraph of this letter from yourself to Dr. Mauchly, which you have previously identified, reads, and I quote:

"I can think of many things that I would like to talk to you about. This list includes statistical Fourier Analysis, resistance harmonic analyzers, computing machines of all kinds, and I suspect there are plenty of other things."

First of all, do you recall any of the "other things" which you discussed with Dr. Mauchly during his visit?

A I am sure there were some other things, but they

were casual and brief. I suspect we discussed the weather and what we ate for lunch and matters of that kind.

Q Just excuse me, Doctor. I don't believe in your letter where you suggested a discussion of other things, you were referring to possible discussion of the weather, were you?

A Do you wish me to interpret the letter for you? Is that the intent of your question?

Q Well, I want to know what you meant by "other things" in this letter?

A I will -- if you will rephrase that question the right way, I will tell you what I meant by "other things."

Q What do you think is the right way, Doctor?

A I think you should ask me to explain the meaning of that paragraph, and I will be glad to do so for you.

Q All right.

A I will suggest to you that that is a conventional method of speaking, in which I am trying to fill out good will and the basis of a visit.

Q You mean you did not intend to discuss with him the statistics Fourier Analysis?

A I don't mean that at all. I meant that no other things were in my mind at the moment, probably, and that was just a casual nice way of phrasing a letter.

Q But you did discuss with him statistics Fourier Analysis?

A Yes. You know he spoke at the meeting on that.

Q Yes, and did you discuss the subject with him before or after the meeting?

A My memory is very slightly, there are various reasons why my memory tells me that.

Q You say very slightly?

A Very briefly is what I mean by that.

Q And did you discuss resistance harmonic analyzers?

A Yes. His harmonic analyzer was such a device, you know. I imagine he told you.

Q Yes. On what occasions did you discuss that with Dr. Mauchly?

A I really don't know.

Q You don't remember when or where or under what circumstances?

A No, I do not. I know that the discussion of that was also very brief and --

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Q Now, how are you so sure the discussion was brief if you don't remember when or where or under what circumstances it occurred?

A Well, I have a very, very slight idea of what, of what his harmonic analyzer was like, and I am sure if I had given it much time and attention I would have given it a great deal more at this moment, but that is, I am doing the best I can for you. This is my best belief, if you --

Q Now, you said you suggested a discussion of computing machines of all kinds. Now, what kinds of computing machines did you discuss?

A We certainly discussed the analog and digital computing machines. And analog was a word that was current with me at the time but the word digital was not as I have stated previously. But most of the time during his visit was spent on the discussion of digital machines.

Q And when and under what circumstances did you discuss the analog computing machines?

A You mean which day?

Q Which day, day, morning, afternoon, evening?

A I don't know.

Q I think you said that you left Dr. Mauchly with Mr. Berry on certain occasions during your visit where you were called off with other duties. Do you know how many times that occurred?

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A It occurred.

Q It occurred?

A I certainly don't know how many times. My belief is that it happened two times at least but --

Q Well, --

A This is subject to the --

Q I think that you testified that Dr. Mauchly was working with Mr. Berry on brush holders, wiring harness, a base ten card reader and the punching mechanism. Now, would he have been doing all of that during, say, two --

A Yes. You see we are speaking about my -- I didn't necessarily leave him when he was working on a computing machine, part of the time he was working on the computing machine I was present. I don't see that connection.

Q You said that you believed that Dr. Mauchly left on the Thursday following the Friday of his arrival, but you do not remember the time of day. Do you remember anything about the circumstances of his departure?

MR. HALLADAY: The question is objected to as an incorrect statement of the witness' testimony, therefore objected to.

MR. DODDS: If the question is incorrect would the witness please correct the question insofar as it implies an incorrect statement of his testimony.

MR. HALLADAY: The question included a statement purported to be a question of fact, therefore, objected to as to form, that the facts are incorrect.

BY MR. DODDS:

Q When did --

A May we have the testimony?

Q Let's -- it's easier to start over again. When did Dr. Mauchly leave on a Thursday following the Friday on which he arrived?

A Well, I have stated I believe he left on Thursday. I have not said without qualification that he left on Thursday, but it's my impression. I know he was there a considerable portion of the following week and Thursday seems to me to be about right, and I believe I have stated this in clear English. Now, he left in the morning from my house.

Q Do you remember the circumstances surrounding his departure?

A Now, what circumstances surrounding his departure would you desire me to --

Q Any that you recall?

A I stated he left from the circumstances surrounding my house. My house was at 3439 Woodland.

Q I am not talking about the environment. Were there other people with you when he left?

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A Yes.

Q Were there family around?

A My family was there. My family was there, yes.

Q Any other people around is all I am interested in?

A My --

Q There may have been --

A There were children about. Now, beyond that, I do not remember any other person being there and I am not sure this is true, but I believe it is.

Q Did he during his visit with you mention going to the Moore School?

A My memory is that he did not, and that I only got this by letter after he left. That's my memory of the circumstances. I have had this through my mind and I believe this is what happened.

Q Do you recall whether Dr. Mauchly left rather suddenly or abruptly in response to a call from his home?

A I remember no such circumstance.

Q Now, I recall that you said that your first contact with Dr. Mauchly after his visit, after he visited with you was at the Naval Ordnance Laboratory when he appeared one day at your desk; is that approximately correct?

A Approximately. Now, I believe I stated it may have been I received a call saying somebody was coming down, but I particularly remember my surprise when it was John

Mauchly, and I met him there.

Q And I think you referred also to a later visit by Dr. Mauchly in the company with Mr. Eckert?

A I did.

Q And do you recall what date that was?

A Well, you got my book. I could get it out of the book.

Q I was asking for your recollection?

A You can get it out of the book, so far as that goes, I believe it was in August of '44, but that is just only my memory and would be subject to correction.

Q Well, in Exhibit DPX3, your affidavit in the Control Data case, you indicated a visit by a Dr. Mauchly and Mr. Eckert on August 30, 1944, does that --

A That must be the one. My date is correct, was it? Yes. That seems to be right.

Q Do you know how you fixed that date?

A I believe that -- I believe somewhere in the archives somewhere there is some correspondence that fixes that date.

Q It's your best recollection that you referred to some of your correspondence in fixing that date?

A I don't know. You know, as I sit here, I know that it's fixed by correspondence. I don't know that it's fixed by correspondence in my file or some other file. That is the question that is open to my question.

Q Now, I seem to recall that you indicated that you had had about five visits from Dr. Mauchly at the Naval Ordnance Laboratory before he later was employed there?

A That is subject to correction also.

Q Certainly. Approximate?

A Estimate, approximately.

Q Yes.

A Several visits, shall we say?

Q Yes.

A With a liberality on the several.

Q Over what time period did that extend?

A Well, you see, my memory is that he came along, oh, probably in the middle of '43 and visited me to begin with, and it was certainly '44 or '45 before he came to work. So there is a period of a year or so in there during which these visits -- over which these visits may have occurred.

Q Do you recall when Dr. Mauchly became employed at the Naval Ordnance Laboratory?

A Oh, there is some records around somewheres that show it.

Q You don't recall it though?

A I do not. I remember it was relatively late in the war. I remember that part of it.

Q Could you say whether it was 1944 or 1945 or 1946?

A I would say probably after that August, 1944 event.

I am not positive that is true.

Q And as I understand it, you said he reported to Dr. Ellison?

A Ellingson, H. E. Ellingson, Dr. H. E. Ellingson. He lives in the environs of Washington, the Maryland suburbs of Washington. I can do better for you than that.

Q That's close enough. Thank you. Do you recall what his duties were reporting to Dr. Ellingson?

A Well, I know what Dr. Ellingson is doing, and I know what Dr. Mauchly is supposed to be doing, and Ellingson said Dr. Mauchly wasn't doing it. So there is a little uncertainty in my answer to that question. The general subject of the operation of Dr. Ellingson's group was the analysis of, the analysis of the performance of ships, as far as actuation of mine mechanisms goes.

Q What did Dr. Ellingson say that he was doing?

A I would rather not say unless counsel insists.

Q Well, if it's something that is derogatory we will excuse the witness.

A Thank you, sir.

Q Do you know of any specific projects on which Dr. Mauchly worked?

A I do not. No. This is part of the give and take there between the gentlemen in question.

Q Do you know the circumstances of Dr. Mauchly's

employment at Naval Ordnance Laboratory?

A Well, he ran out of work, apparently, and he needed money and he needed another job in order to make more money. This is the kind of representations, and I, of course, you are always short of, in a war, you always need help, you know.

Q Well, did Dr. Mauchly approach you?

A He did.

Q With reference to obtaining employment?

A Yes, he did.

Q And did you have any hand in his being employed?

A I did. Yes.

Q And do you recall whether it was of any contract or any special arrangement or did he just come to work or what?

A Well, let's see? My memory is that he worked under two circumstances in the course of his stay there, and one of them he worked for the Navy as a contract employee and the other one was that he worked for the Navy indirectly. He worked specifically for Iowa State University.

Q Do you remember which character came first?

A I am a little bit uncertain. Just from the circumstances I would suppose Iowa State came first, but my memory says it's the other way around.

Q Whichever came first, though, you aided Dr. Mauchly in securing employment?

A I did in both of those.

Q Both of them?

A Both of these employments, yes, I did.

Q I think you said yesterday that it was your recollection that he was employed a matter of a few months?

A Yes. I suppose three. Maybe two or three months. I am not sure. And for a few days, maybe a day or two a week or maybe three or four days a month or some such terms of employment as that.

Q Dr. Mauchly --

MR. FALLON: Dr. Atanasoff.

BY MR. DODDS:

Q Dr. Atanasoff, I think you testified that the compensation for your assistance to Honeywell was not contingent upon the outcome of the case in any way, is that correct?

A That certainly is the case, yes.

Q Do you stand to benefit from the outcome of the case in any other way?

A I hear that question, and the answer is no, but I wish you would repeat it and allow me to answer it in earnest.

Q Then maybe I would be a little more explicit and take it in steps.

A Yes.

Q Under your agreement with the Research Foundation

of May 6, '68, you have --

A Are we talking about my relation with Research Foundation now?

Q This is background if you would bear with me.

A I am sorry.

Q You assign your rights or any rights you may have in the ENIAC patent to the foundation, do you not?

A I do.

Q And under that agreement, as I understand it, you would share with the Foundation the proceeds from exploiting such rights?

A Right.

Q And you are aware that the Foundation intervened in the Control Data case or moved to intervene in the Control Data case?

A I am aware.

Q Now, if they were to intervene in this case and be successful on the issue of enjoint invention, then you could expect to benefit very substantially from the outcome of this case, could you not?

MR. FALLON: I think that's objectionable. It's suppositions all the way through. Can you unload it a little bit, take out the very substantially, for one thing?

MR. DODDS: Well, all right.

I will eliminate the very substantially. And I might also make the representation that Mr. Griffen who is general manager of the Foundation in a deposition in the Control Data case indicated that the matter of intervention in this case was under consideration so it is not just a wild guess.

BY MR. DODDS:

Q So the question is if the Foundation moves to intervene in this case and is successful and the outcome of the case is successful, you then would stand to benefit by a favorable outcome of this case, would you not?

MR. FALLON: By favorable outcome you mean favorable to the Foundation, is that correct?

MR. DODDS: Favorable to the Foundation.

THE WITNESS: Oh, yes. If it's an outcome favorable to the Foundation I will benefit from this case.

MR. FALLON: Ipso facto.

BY MR. DODDS:

Q Certain of the documents which you brought with you, I believe it was folder I -- I don't think you need to get them, were brought in a registered mail envelope from Mr. Allegretti's office mailed May 6, '68. What did you receive in that envelope?

A I haven't the remotest idea.

Q Would you refer to folder B-8, Exhibits 74 and 76?
A Thank you.

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Q At page 246 and 247 of the transcript, I believe you testified that Exhibit 76 is a typed copy of No. 74? Would you like to recheck that?

A I have checked it.

Q Just to keep the record straight, is Exhibit 76 in fact a typed copy solely of Exhibit 74?

A Not quite. I think part of the last two sentences are missing from 74, I now discover. I didn't discover it at the time.

Q Yes. I just wanted to keep, to avoid confusion in the record.

In folder B-16 --. I think you testified at pages 275 to 277 of the transcript that you received these two items from Dr. Aiken by hand, Dr. Aiken of Harvard University?

MR. FALLON: Which items are these?

MR. DODDS: 139 to 143 is one item and 144-145 is the other item.

THE WITNESS: Yes.

BY MR. DODDS:

Q Did you receive these by hand on the same visit to Harvard?

A I believe I did, yes.

Q Well, did you --

A Now, that may not be true.

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Q If you look at the footnote at the bottom of page 143 and the one at the bottom of page 145 --

A I have read those footnotes.

Q You have?

A Several times.

Q You still think --

A I believe this is the case, yes. I just think that what happened, that he had these two materials and he probably just had one or two of the last set, but he wanted me to have them and he gave them to me anyway.

Q Thank you. I just wanted to clarify, there seemed to be a little --

A Discrepancy. I wondered about that, but that's what my memory tells me --

Q Yes.

A -- and it's all I can say. I happen to be reasonably certain I only visited Dr. Aiken at one time, incidentally.

Q These various files that you have produced here, Dr. Atanasoff, as I understand, these were originally with you at the Iowa State College in Ames?

A Yes.

Q In the physics building?

A Yes, they were. They were in room 52 of the physics building, to be precise.

Q You left Ames, I believe you testified, in September

of 1942?

A Yes.

Q And moved to Washington?

A Yes.

Q Now, would you tell us just what steps you effected in moving to Washington? Did you --

A Well, the files did not accompany me to Washington immediately, but the files --

Q Just a second. Let me interrupt. Just how did you effect your move, just what steps did you take? I mean you yourself moved physically. I assume you had certain personalties that went with you and I would just like to know the circumstances under which you effected this move to Washington.

A I guess that I can give you, I can certainly talk on the subject. I don't know exactly what it is you are reaching for, so I'm not going to be very helpful, perhaps. I packed some trunks and suitcases and traveled to Washington by train. Is that responsive, as far as you are concerned?

Q I suppose -- did you initially move into a hotel or something?

A Oh, I believe I stayed overnight in some hotel and then afterwards I took quarters in a house that had a couple of rooms to spare near the gun factory.

Q Well, then did you take with you on the train your

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personalties other than these files?

A I took with me personalties -- I guess you mean suits --

Q Personal effects.

A Well, I took some personal effects. I took suits -- my family were remaining in Ames, as you know, and I took suits and shirts and socks and neckties and toothbrushes and such tings as that. Now, I didn't take the files.

Q Was there, were there things other than the files which you left in Ames and had sent to you later?

A Yes, there were other things, books, for instances. I remember precisely about those because there was no room at the time for books and things in Washington. Conditions in Washington were awfully bad and my living conditions in Washington remained bad for a considerable length of time. yes, books.

Q Do you remember anything else? I mean just categories?

A Well, tools, let's say.

Q I suppose you probably had a workshop in your home in Ames?

A That's right, and, you know, -- of course, no furniture and --

Q When did you have any of these other personalties sent to you, for example, your books?

A Well, my wife left Ames. In due course, my wife left Ames and took the children to Florida because of the health of the family, and at that time the material was shipped to me. I am trying to remember when this was as well as I can. It was a matter of two years or so, though, I imagine, and I can get the date very well for you in the future.

Q That is sufficient. I am not interested in detailed dates.

A Then I commenced to get more stuff and I got some of, I got some of the files and I remember that some of the files were packed by Sam Legvold later and sent to me. One box of files had been left in the physics department. They were shipped by Sam Legvold later, I believe. I believe Sam Legvold also sent me some of these patent drawings which are in these files.

Q Do you recall when the first quantity of these files were shipped to you in Washington?

A Oh, I imagine at the end of a couple of years or so.

Q And do you recall when the shipment of your files, and, of course, I am only talking about files which included the material you produced here.

A Yes.

Q When the final shipment was made to you?

A Well, before the end of the war, at any rate.

Q But it was a matter of several years?

A Yes. There might have been, there may have been items come as late as 1944, I would say.

Q And do you recall to what address in Washington these files were shipped?

A I do not.

Q Well, were they shipped to you while you had these quarters?

A Temporary quarters, yes.

Q Temporary quarters in Washington near the gun factory?

A Near the gun factory, yes, or maybe a mile or two from the gun factory later. Later -- at first I didn't have a car in Washington so I had to have quarters near the gun factory. Later I had a little more choice where I could live because I had a car, and I believe it must have been 18 months to two years before I had a car there. Cars were hard to get. Do you remember that era?

Q Yes, I do. Did you live at several locations during this two-year period commencing in September, 1942?

A I did. Yes, I did. I think three. I think perhaps three.

Q So the files were not with you when you were moving around during that period?

A Well, I think the original shipment of the files was moved during that period, and then, of course, it was moved later. Towards the end of the war, I bought a farm north of

Washington between, well, near a town called Fulton, Maryland, and then I had the files there, and I remember that distinctly. Now, that must have been, that, of course, was initiated by the fact that the laboratory was moving to White Oak and the farm was closer to White Oak than it was to Washington, you see, considerably closer to White Oak, and at the time that I got the farm, why, then I remember distinctly having the files out there in an old file cabinet at the farm.

Q During the period when the files were at Ames before you moved from Ames, who, if anyone, had access to your files?

A Well, I imagine -- they were left in one or two places there, either left in my home, and that would, those files would have to have been, that would have been Laura that had access to them --

Q Excuse me. I said while you were still at Ames.

A Oh, I am sorry. Who would have access to the files while I was still at Ames? Well, I had a secretary. I had a secretary over a period of time and I didn't have one secretary, I had several, one of whom was Mrs. Berry, and the other secretaries I cannot remember their names, but the secretary would have had access to them and to a limited extent, Clifford Berry would have had access to them because Clifford Berry was -- I had a secretary upstairs sitting near the door to my office and, of course, he was up there

conferring with the secretary and seeing to business, and he could have gone into the files.

Q How about Dr. Legvold? Would he have had access?

A Well, you see, Dr. Legvold was one of my associates and there was a period there when Dr. Legvold could have had access to the files.

Q Do you recall anyone else at Ames that might have had access to your files while you were there?

A Not otherwise than surreptitiously.

Q Yes. I mean authorized access.

A Yes, and really, I don't suppose Sam had authorized access, although such things develop casually, as you know.

Q Now, when you moved to Washington and before the files were shipped to you, were they retained in the physics building or were they retained in your home?

A My memory is that part were in the physics building and part were in my home.

Q Of course, those in your home I assume only your family had access to them?

A Yes, that is true.

Q Those in the physics building --

A They were under the jurisdiction of Mr. Sam Legvold at this period.

Q The ones in the physics building?

A Yes, they were, and he was, they were boxed and he

was supposed to maintain them securely. We had an understanding about that, and, ofcourse, as far as I am concerned, I would just as soon have Sam Legvold keep anything of mine as to keep it myself because I feel just as secure. I won't say that there might have been additional items that were picked up and set aside that were not boxed, but the main part of them was boxed, is what I am trying to say.

Q But you don't have any way at this time of distinguishing which were which?

A Not at all, no.

Q When you moved to Washington and when the files were forwarded to you, I think you said about two years later?

A (Witness nods head affirmaatively.)

Q Did anyone there have access to your files?

A No.

Q Again, I assume you mean excepting surreptitiously?

A Yes.

Q I assume they were not locked up?

A They were not secured in a bank vault. They might have been secured in a locked cabinet or they might not have, but I am not sure, really.

Q Now, would you refer to folder B-7, Exhibit 72.

While we are doing that, Doctor, when the files were there in Ames, and you were there, would any of your students have had access to your files, any of your

graduate students that you were supervising?

A Not according to the correct relationship between us. That doesn't mean that a graduate student might not feel a degree of familiarity, that if he knew exactly where a thing was, he might not take it out.

Q You wouldn't include that within surreptitious access?

A I would not, no.

MR. FALLON: 72?

MR. DODDS: Yes.

BY MR. DODDS:

Q Which I believe is the original of a letter from yourself to Dr. Legvold, and I think you indicated before you had some question as to how this happened to be in your file?

A Yes. You see, what must have happened is that I sent it to Sam Legvold and then somehow it got drifted back to my files.

Q During the period, it must be when he had access to your files?

A Right, or, he may have. I don't know how accurate files Sam himself kept, and he may have made use of my secretary at the time. Probably he did, or he may have said, "Here, Jean, read this," and then Jean read it and it went in my files, you see. That may have been the answer.

Q Would you refer to folder C-3, Exhibit 408. I think

there must be -- that can't be the right number.

MR. FALLON: You said C-3, document 408?

MR. DODDS: I think that must be a mistake.

BY MR. DODDS:

Q I don't recall, did you say this was in your handwriting?

A (Witness shakes head negatively.)

Q Do you know if that is in Dr. Legvold's handwriting?

A It might be.

Q You don't know?

A You know, I just don't know his handwriting the way I do my own, and so I would have to get a piece of his handwriting and compare it, and I haven't done that.

Q So you are not, you can't be certain at this time who --

A As far as subject matter goes, it might well have been in Sam Legvold's handwriting.

Q You can't state with assurance who wrote that and put it in your files?

A No, I don't know that.

Q When you would like a break, Doctor, feel free to say so.

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A I would like to leave about 5:20.

Q Well, I thought if you wanted a break --

A I would like a break too. Would you like a break too?

Q I will leave it to you.

A I will have a break. Thank you.

(Recess taken.)

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BY MR. DODDS:

Q Dr. Atanasoff, at page 13 of the transcript you testified, and I quote: "I have gone systematically through the logic, through the theoretical logic of the computer machine which is about to be described." Where did you go for -- to learn about the logic of the machine?

MR. HALLADAY: The question is objected to as vague, indefinite and confusing and the reference to a part of the transcript which sounds to me as if it were out of context.

MR. DODDS: Let the witness read the context.

MR. FALLON: Before you answer the question I would want a clarification. Have you read the statement?

THE WITNESS: Yes.

MR. FALLON: I would say that the question carries with it an assumption which is not supported by the statement you made. If we eliminate the assumption that he had to go some place, if you want to ask him to further address himself to that statement, I have no objection.

MR. DODDS: I will ask you --

BY MR. DODDS:

Q What was the source of the logic through which you

went?

A Oh, I call my own activities relative to this machine logic.

Q And the logic you were using it in that context was just the -- your own familiarity?

A I mean that I had gone through the add-subtract mechanism and the other elements carefully part by part to insure or that the logical precepts which were supposedly designed into those parts were in effect designed into those parts.

Q Well, my question was, what was the source of this? Was it, say, the booklet, Exhibit 455?

A Sure. And also my own rationale relative to the circuit diagrams.

Q Well, what circuit, what circuit diagrams?

A Well, shall we say Figure 2, Figure 1 and Figure 2?

Q No. That's a part of Exhibit 455 booklet?

A Well, all right, yes, if you wish. That's fine. Put it that way.

Q And the experimental work which you referred to in that same paragraph, I suppose that included your work on the Exhibits Y and Y-1?

A It does. It does, yes. That's put very well. Thank you.

Q Now, this may have been covered but I am not quite

clear. At page 17 of the transcript you referred to obtaining some papers from Mr. Berry's files. Would you like to refresh just what you said?

A Yes.

Q What were the circumstances or the factors which led to your getting this material from Dr. Berry's files or Mr. Berry's files?

A Well, I don't think that anybody told me to go get the material from Mr. Berry's files, but it was clear from my relations with counsel, from the counsel which I had contracts that they would desire that such material be gathered, collated and understood, and it was pursuant to such purposes that I did it.

Q Did any of the counsel with whom you have been working specifically suggest that you search --

A To the best of my knowledge they did not, they might have and they have on some occasions in some special case suggested something to me, to be sure, but in the main, they have not made many suggestions to me, and I have been left free to pursue the matters and gather the material as I saw fit.

Q And I believe the records and some of the correspondence shows that you got some of the documents when you visited Mrs. Berry in California?

A That is literally not correct. Maybe I said that, and the documents may purport -- may seem to show that,

but as a matter of fact, I had planned to go visit Mrs. Berry's house to secure documents, but Mrs. Berry collected the documents, and I met her in Ames, and she delivered the material to me.

Q So you didn't actually physically get any documents while --

A Then later I did go to the house, but at that time I only got photographs, and I don't believe a document, not one document. We did look but I don't think I got one document.

Q So on your first visit you didn't physically bring any documents back with you?

A On my first visit to the house I did not bring any documents back with me to the best of my knowledge and belief.

Q Did you get --

MR. HALLADAY: Excuse me. Are you excluding photos as documents?

THE WITNESS: I am excluding photos as documents. Thank you.

BY MR. DODDS:

Q You explained that. You got those on the second trip --

A Yes -- no, on the first trip to the house, and we will get this, I don't know what the record will show, but --

MR. FALLON: Your answer was right as

the record stands.

BY MR. DODDS:

Q Did you get copies of all of the material in Mr. Berry's files relating to the work on the ABC machine?

A I did.

Q There was no exclusion?

A Well, you know, there might be some little, somebody somewheres that is excluding something that I don't know about, but not to my knowledge.

Q There was no purposeful exclusion?

A On my part?

Q On your part?

A On my part there was not.

Q Now, would you refer to folder B-2. Maybe you don't need to refer to the folder, those are the two articles, I believe, relating, by George Stibitz as related by or as written by another party. I believe that you testified at page 220 that these were given to you by counsel for plaintiff -- I am sorry -- yes, it's at 220?

A Yes, I have them here.

Q Do you recall that testimony?

A I would be glad to recall it.

Q It's the last line of page 220.

A I believe that is right. Do you wish me to verify that?

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Q No.

A All right. You wish to ask me something else?

Q No. I just wanted to verify your testimony?

A That seems to me to be exactly right at this moment.

Q Now, would you refer to folder C-2, Exhibit 202. Would you review what is numbered paragraph 2 plus the introduction to that paragraph? Did you get these documents from two sources or these are the same documents that are referred to here, are they not, in Mr. Bradley's letter?

A My memory tells me that I remember receiving a pair of those documents from counsel for plaintiff. Now -- all right. I may have two of them somewheres in my files. I don't know. I don't see them here.

Q Well, are you presently inclined to believe that probably you received them from Mr. Bradley?

A No. I am not. I am inclined to believe I received them from plaintiff but now if you want me to say am I inclined to believe that I also received some from Bradley, I suppose that must be the case.

Q Well, if you received them also from Bradley, would they not have been in your files?

A I would think so but maybe not because they might not have even ever got in my files. They are not material pertinent to the case at hand.

Q In this same folder, item 17 is a print of a readout

I believe, from the Bell Laboratories computer.

MR. FALLON: What folder is that?

BY MR.DODDS:

Q I am sorry, in the preceding folder,B-2?

A Yes, sir.

Q When did you first learn about the Bell Laboratories computer of which this exhibit 17 is a copy of a read out?

A Well, I don't know. I imagine that I had known about it for a year or two previous to my visit there in '41. I don't believe I heard about it before 1940, probably.

Q Do you know whether or not there was any contemporaneous publication describing that computer? The two documents referred to starting with Exhibit 18, of course, were published much later, 1967?

A Oh, yes. Those are, looking backward, historical kind of items and I don't consider them pertinent, but, and I don't pay much attention to them, but let's see, were there any publications? I believe there were.

Q Approximately contemporaneously?

A There were certainly informational publications. I don't remember having seen at any time, for instance, a mathematics meetings why they would demonstrate the machine and then it would be recorded in the minutes of the mathematical association or mathematical society, as the case might be. I remember that kind of article, but as to

any article which gives a description of the internal workings of the machineI do not believe I have seen, I have seen any at any time to this very day.

Q But from your observation at these professional meetings of the demonstration you acquired, did you not, a fairly good understanding of the operation of the machine?

A Oh, you knew their functional -- here is a black box, you knew what the black box did, but you didn't know what kind of gears were in the black box, but, of course, most of us could make some sort of guesses about that, too.

Q Now, in folder B-3, documents 4, 5, 6 and 6-B.

MR. FALLON: I think we have a difficulty here. These are just 40's.

MR. DODDS: Maybe I have an error. I am sorry. I am sorry. I believe that's A-3 instead of B-3.

MR. FALLON: Here they are. This is what he had in mind, 4, 5 and 6.

MR. HALLADAY: I didn't catch the reference.

MR. DODDS: Folder A-3, Exhibits 4, 5, 6 and 6-B.

THE WITNESS: Right.

BY MR. DODDS:

Q Which I believe you described at page 205 of the

transcript as a radio broadcast script?

A Right.

Q Which you delivered?

A Right.

Q And on page 6-B there are, at the conclusion, two or three questions which I believe you testified you had no answers prepared in advance. Do you recall whether or not you answered those questions and how you answered them?

A Let's see. Well, you can be sure it was some kind of a -- if it was answered, you can be sure it was answered briefly.

Q You don't have any present recollection?

A I don't. No.

Q Of whether you answered or if you answered, what you answered?

A No. And I think I answered because when people ask me questions they get answers, but that's about my only logic in the matter.

Q Now, would you refer to Folder B-10, Exhibit 93, which you identified as a copy of a letter from yourself to Dr. Mauchly and in the last paragraph, and I quote:

"Progress on the construction of this machine is excellent in spite of the amount of time that defense work is taking," etcetera.

As of that time in May, 1941, what fraction of your time

was being taken by defense work?

A Half.

Q Pardon?

A Half.

Q About half?

A Yes.

Q And how long did that continue, the duration of your stay at Ames?

A It went on until I left Ames. And the date of the beginning, I believe it began early in '41 and went on until the end of my stay there. Now, you realize, Mr. Dodds, when I say half, I mean half of the time that is left over, after I had done a good many other duties, just current there, so it was biting substantially into my progress. I think that was the intent of your question?

Q Yes. Maybe you would refer to Defendants' Exhibit S, and to save time I happen to have two copies if you want to look at one of them.

A All right.

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MR. FALLON: Is that S or 5?

MR. DODDS: S.

THE WITNESS: I'd say that was 5.

MR. DODDS: It's my hand and it is supposed to be an S.

THE WITNESS: It is an S. All right.

MR. HALLADAY: I am still confused.

MR. DODDS: I am sorry, this is Plaintiff's Exhibit S.

MR. FALLON: It is Atanasoff Deposition Exhibit S.

MR. DODDS: Atanasoff Deposition Exhibit S.

MR. FALLON: All right.

BY MR. DODDS:

Q You referred to this list in testifying about the photographs which you may recall I think are 1402 to 1419?

A Right.

Q How long has this document been in your possession?

A This document?

Q The original. That's a copy.

A Yes, a month, but the source material has been carefully kept during this period, and I felt it should be summarized in view of the fact that I was bringing all my files out here in kind of a mess and I needed something to

bring with me, and the source material, I had clipped indications of the source material on the pictures themselves, you see, and so I had them under control since the time I received them.

Now, go ahead. I guess I am running out of steam here. I don't know what you are reaching for.

Q So that this was prepared as, I gather, in preparation for your bringing the documents to this deposition?

A It was, yes, sir.

Q Is there any particular reason that accounts for the fact that some of the numbers are from a numbering machine and some are in longhand?

A They are in longhand if I numbered them in longhand, you know. It's just a matter of convenience, is the only thing that accounts for it.

Q No significance?

A No significance whatever. I will tell you, okay, I can give you a better explanation. Let me try. Now, at first, I was sitting here numbering the photographs with a machine but I was numbering these things by hand, and I said, "You fool," why don't you turn up the three on the machine and start doing it the other way?" And I did so. Then I got down here to 20, and for some reason, I had to go back to hand lettering. I don't know what that was.

Q But in any event, they are of no significance, the

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numbering?

A I have no knowledge of any significance.

Q And all of the entries on this exhibit S were made --

A By me in my hand.

Q And about the order of a month prior to the deposition?

A That is right. Perhaps in the month before the first session of this deposition.

Q Yes. Yes. Now, you remember Mr. Berry's draft patent application. I don't know whether you want to refer to it or not. I only have a brief question. Where did you get it?

A Where did I get it?

Q Yes.

A Clifford Berry and I wrote it.

Q Well, but did you retain it, has it been in your files since that time?

A Oh, I see what you mean. Oh, yes. Oh, yes. Those patent applications did not come from Trexler. I have his original penciled -- you know, I said, "Clifford, I am awfully busy," and he had more time because he wasn't tied up with the research project, so he wrote it, but I worked with him on it and we put in a lot of time together on it and discussed items therein, and we had, I remember the discussion because he wanted to, he wanted to -- you know my use of the word abaci,

and that he did not like, so that was eliminated from the version, if you care to verify, and I remember one or two other instances of a like nature of give and take between us when we were writing it, and I think you have a copy of the penciled original.

Q Yes. Then, is it my understanding that those papers were put in your files as of about the time they were written?

A They were.

Q In Ames, Iowa, and they have been in your files ever since that time?

A They have been.

Q Now, referring to the ASM test units which you testified were in use in testing your computing machine back in 1941, but as I recall, you said you didn't, were not able to find any circuit diagram of that test equipment extant.

A (Witness nods affirmatively.)

Q Do you remember how many vacuum tubes were in it?

MR. FALLON: Which are we talking about?

MR. DODDS: The 1941 test unit which was used but which there apparently seems to be no documentary evidence.

MR. HALLADAY: I am confused. Are you speaking of vacuum tubes in the test set?

MR. DODDS: Yes.

MR. HALLADAY: Or vacuum tubes on a module that was --

MR. DODDS: No, I am talking about the vacuum tubes in the test unit.

MR. FALLON: That would correspond to Exhibit Y.

BY MR. DODDS:

Q Corresponding to Exhibit Y.

A I will give you a guess.

Q If it's an educated guess, I will accept it.

A I believe there were two, probably, but these vacuum tubes, they are just principally because we didn't have diodes, suitable diodes for rectifying the high, and they were diodes, diode rectifying tubes.

Q Yes, triodesconnected to diodes?

A No, I don't believe so. I believe they are 80 rectifier tubes, but that's my memory of what was in there, but I know they had, they did contain the necessary electronic equipment to rectify the current, but no, there was nothing else in it, nothing else.

Q You do recall, you think there were the two type 80 rectifier tubes?

A I believe there were. I don't believe -- we tried to do it with one and I believe -- you know, it's a shame to

put an extra 80 in when one would do, but I believe we had to use two.

Q You probably made a four-way rectifier, didn't you?

A No, we didn't care so much about that, but --

Q Which is a higher voltage?

A You had to have a positive and negative, don't you see? You remember that. And for that kind of stuff you would regard the way you handle a ziode.

Q Did you have a transformer in it?

A Oh, yes.

Q Do you remember what type it was?

A I don't.

Q What make, or do you remember anything --

A We had Thorgeson. It was a little box.

W-16-2

Q The transformer I am talking about, can you put that in words?

A Well, shall we say four by four, let's say three and a half by three and a half inches or something of that size.

Q And what was the third dimension?

A Perhaps by three inches.

Q Did you have -- I believe you said you had one or two meters?

A Yes. Now, the meters were never installed in the box, I remember that. They were separate, out to one side and they were just the multi-meter type, which is relatively cheap and with relatively high impedence so we could clip them into the lower impedence parts of the circuits, that means the output terminals of the add-subtract mechanism, without affecting adversely the results.

Q What other components did you have in the test unit?

A We certainly had resistors and probably some voltage adjusting potentiometers.

Q Filter condensers

A Surely, yes, and a --

Q A choke?

A And a choke, and I believe we used resistive filtering on the, my memory is we used resistive filtering on the negative because we didn't have very much demand of current, but on the positive we needed a little bit more

current, and then, of course, that had to supply filament current for the tubes in the add-subtract mechanism.

Q Did you have a separate filament transformer?

A My memory is not, that we managed to find one transformer that would do it all, but you can't rely on my memory in a matter like this.

Q It might have been a regular high voltage transformer with a tap for filaments?

A Yes, sir.

MR. DODDS: I wonder if we could have chart V, Exhibit V?

MR. FALLON: We have it.

MR. DODDS: Yes, okay.

BY MR. DODDS:

Q Dr. Atanasoff, who participated in creating this drawing, Exhibit V?

A Myself, but I shouldn't name myself first. I would say, first, Mr. Charles Call who is very familiar with the photographs of this case; and patent draftsman whose name I do not know, I met him but I do not remember his name, and myself.

Q Only you three?

A Well, I am not sure. Maybe when I was gone they had somebody else work on it.

Q No others were working on it or advising with

respect to it while you were working on it?

A I'll tell you -- you don't happen to know Mr. Charles Call, do you? I just might add those words.

Q I don't believe I know the significance of that comment.

A Well, if you knew him, you would realize that when you got Charles Call pumping the pump, pumping a problem like this, why it doesn't need much pumping. He is a powerhouse.

Q Well, during the time that you were, that this drawing was being produced or created, with whom did you discuss it?

A With Mr. Charles Call and with the draftsman also on several occasions.

Q And with other counsel?

A No. Other counsel, well, I will testify to things that I don't know. No other counsel did I discuss it with.

Q And what in this was your contribution and what was Mr. Call's contribution?

A Well, Mr. Call went right ahead with it from the photographs and it looked awfully well the first time I saw it, and then, but I sat down and took time and went over and over it and came up with five or six suggestions, and then the draftsman was called in and he executed these suggestions and then we looked at it again, and, of course, we found three or four more things that needed doing to it, and that's

the way this drawing was perfect. I might add that, you know, I think that it was being perfected a day or two before you got here the first time.

Q I don't have a reference to the transcript, but I have a note to the effect that you said that so far as possible, this drawing, Exhibit V, represented the elements and components in the ABC machine in its final form with the exception of some of the elements were, and I quote, "equivalents" of those in the 1941 machine. I wanted you to explain that a little bit.

A I am unable to.

Q Pardon?

A I am unable to. If those were my words, why, I will have to read the context and try to match them.

MR. DODDS: Will you see if you can find it? We will come back to that.

Now, can we look at Exhibit W? That is up there. All right.

THE WITNESS: You see --

BY MR. DODDS:

Q Now, was it the same team that created Exhibit W?

A How is that?

Q Was it the same team that created Exhibit W that created Exhibit V?

A It was the same draftsman, but he was told to take

the original drawing, Figure 1, and copy it with the errors in it just as it was in equivalent form so it could be photographed and enlarged.

Q Did you take care of that yourself?

A No, I didn't, but after I verified it, I went over every little piece with my own eyes, and you can do the same. It's right here before you. You can do it in five minutes and see that it's just the same.

Q Now, the error in Fig. 1, when was that discovered?

A That was discovered by a gentleman --

Q I didn't say by who, when?

A When, I am sorry. It was discovered after the beginning of these cases.

Q And under what circumstances?

A Well, you know you have esteemed intelligent counsel in the case and one of them by the name of Mr. Kirkpatrick discovered that error.

Q Well, tell me, what do you know about the circuitry which is represented in the original ABC machine?

A Oh, my goodness, you know, after you have used vacuum tubes a little bit, why the answer is almost immediate and you can understand, you know there is no question butwhat the circuitry in the original machine was right. It wouldn't have done a thing if it hadn't been right. And, of course, I went ahead and built this thing according to my revision

and it worked perfectly, and so it was everything in that.

Q According to your revision, you mean after Mr. Kirkpatrick pointed out the error?

A Yes. I didn't see it. I am sorry. I was real proud of Mr. Kirkpatrick on this occasion.

Q Well, maybe you would like to read the first paragraph at page 697 of the transcript, and then in that connotation we can ask you a question.

A Well, I think this is somewhat stiff, but a correct explanation of the process by which this drawing was developed.

Q I just wanted toknow what you meant by equivalent of structures?

MR. HALLADAY: Would it be helpful for people attempting to follow what we are doing here to know what it is he is reading?

MR. DODDS: I said page 697 of the transcript.

MR. HALLADAY: That's fine. But I have no idea, the court reporter has only a reference to the page. The words are a mystery to me.

MR. DODDS: I asked him to read the first paragraph and that includes the language --

THE WITNESS: May I read it aloud?

BY MR. DODDS:

Q Yes, surely.

A "This exhibit was prepared by draftsmen from photographs and from discussions with others, but I had played the following role in the preparation of that. At each stage of the development of this drawing by patent draftsmen, I have marked the structures presented there and have verified that they are the same or the substantial equivalent of structures which are contained in photographs or as have been known to me, known to me to be elements of the structure of the original machine."

Mr. Halladay, at this point in the transcript, we are talking about what?

THE WITNESS: We are talking about Exhibit 5.

BY MR. DODDS:

Q Exhibit V.

A I am sorry, Exhibit V is right.

Q The question was -- may I see that? The question was, what you meant there by the use of the term "substantial equivalent of structures which are contained in photographs"?

A I recommend that I correct that to read, to leave out that terminology, as more accurate without that terminology. I know of no such substantial equivalents.

Q Now, if we can refer to Exhibit X, which is

the next chart there, and again, the initial question, who participated in creating this Exhibit X?

A I believe the Exhibit X, I have attempted to verify, it, I believe it is an exact replica, not a photographic reproduction of the photograph in the original machine, but it's an exact replica drawn by draftsmen to permit enlargement. I believe this is the source of it.

Q Enlargement of what?

A Drawing 2, figure 2 in the manuscript which is, you know, the manuscript, 455.

Q 455?

A Right.

Q Again, who participated in its actual physical creation?

A Well, Mr. Call, the patent draftsman, and I, but the patent draftsman in the main work alone because he had no need for directions. Then after it was through with, I, however, checked it for accuracy, and I hope I am right.

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Q Well, now, I notice that Fig. 2 of the manuscript, Exhibit 455 has some operating voltages on it. This doesn't seem to have any?

A That's right.

Q Is there any reason for that?

A There is no reason for that.

Q Is it just an oversight?

A It's just one of those things, yes.

Q Now, I think you described the grid of the triode 9 as 3, that'ssometimes known, called a floating grid, isn't it?

A Called floating grids.

Q And when the grid is floating is tube 9 conductive?

A Sometimes and sometimes not.

Q Well, is it conductive when a suitable anode voltage is applied, anode decathode voltage is applied?

A That is, that tube is conducting and you know, it's a funny thing, I remember that right from the very day when it went in there, and this was Clifford Berry's invention, I can tell you that, and I suppose if you take this to any technical man he would say: What in the heck is that? But I was building the replicas and with the same tubes and I decided

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A That is true. That is true.

Q Do you have any present knowledge of the values of any or all of those resistors in the original ASM's?

A We -- I could easily describe to an electronics man, and if you want to assume that role I will describe to you the

A That is true. That is true.

Q Do you have any present knowledge of the values of any or all of those resistors in the original ASM's?

A We -- I could easily describe to an electronics man, and if you want to assume that role I will describe to you the methods for derivation of same.

Q I want to know what they were, not how you got them?

A You mean have I got them memorized now?

Q Well --

A Or can I work them out?

Q Can you tell us what they are approximately?

A No. I prefer not to do it. I can begin by telling you that tube works very well with a plate of 50,000 ohms, with a plate resistor of 50,000 ohms.

Q Now you are actually speaking of the resistor in the cathode circuit though, are you not? The plate is connected directly to plus 120 volts?

A No, I don't think so.

Q To plate 9?

A Oh, are you talking about the plate of 9?

Q Yes.

A You are still talking about 9?

Q Yes.

A I am awfully sorry.

Q Yes.

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A Oh, I thought you wanted a whole array of resistors, and I was just lighting in to tell you those.

Q Oh, you were talking about the plate resistors generally of the other tubes?

A Yes. That's right. I wasn't talking about 9. I was talking about all the rest of them except 9, to tell you the truth.

Q And they were what order of magnitude?

A They were 50,000 ohms, and then I just, and that's mentioned in the manuscript and, however, 50,000 ohms is not one of the standard sizes now so we use 47,000 ohms and that's fine.

Q How about the grid resistors?

A Now, you see you have read the manuscript and you see those two numbers accompanying each?

Q Yes.

A Now, for instance, take this one right here, three, three, there is one, you see there are three of these resistors that go to plates. Now, take this one right here, for instance -- wait a minute, take this one right here. It goes up to a plate.

Q Yes?

A Take this one right here, see if it goes up to a plate?

A Yes, it goes up to that plate above, runs right up there and goes to that plate you see, the plate is a low impedance source.

Q Yes.

A It says there are three, the first number in that parenthesis says that there are about -- I am going to verify one thing just because I might slip on it. I turned to it exactly and I will have it in a second. All right, there are -- it says that there are three resistors in the grid of this tube going to plates.

Q Yes.

A One goes to the negative supply but three of them going to plates.

Q Yes.

A That's the first thing to verify and the first three right there. And the second three says that all three of those will have to be, I just forget, low, which means that the corresponding plates are going to have to be unblocked, the plates and tubes which carry the plates that they go to will have to be unblocked in order to make this tube block and hence have this plate high.

Q Sort of an N circuit?

A Yes, it is. It is exactly that, but it's a peculiar kind, you see, where you have a variable you can have two high

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or three high and they are all arranged that way. That is exactly what it is.

Q And do you recall what the order of magnitude of the grid resistors was?

A Oh, yes. Sure. The grid resistors run of an order of a half a meg. To a meg and a half and stuff of that kind and they have very little influence on the plates so you don't have to go back and worry about the plates not working substantially as they should, and it's a very simple thing once you set it up to, and you can calculate them, calculate what they need to be in order to make them work.

Q Do you have any recollection as to the order of magnitude of the resistors in the cathode circuit of tube 9?

A Yes. I believe that the cathode circuit there is, I believe it's a couple megs, my memory is it's a couple megs in those units yonder.

Q Right behind, back on Exhibit W, if I might, do you have any idea of what the value of the resistor between the terminal D of the ASM, and going up to the plate of tube T1?

A Now, you see, those resistors don't matter, it's a ratio of the two that matter.

Q That's right.

A That's the only thing, providing they just as well be of the order of meg because that is plenty low enough to feed into the input and you got two megs in that other circuit

and you got to unclamp it from the other circuit, so if you got two or three megs there and you use a couple resistors of a meg and then you are down to a half a meg in that input circuit and then the whole thing is hunky-dory.

Q In your description of this, going back, I am sorry, to the exhibit, in your description of this the other day, Doctor, I don't think you refer to the terminals G and F?

A Right.

Q Would you perhaps indicate what those are?

A Those are the terminals which tell the machine to add or subtract.

Q Do you recall which is which?

A I would like to peak if you don't mind because I could in the course of time, if you like to have me take the time, I will attempt to verify.

Q I think that is probably not necessary.

A I am prepared if you wish to work out the logic of the entire system but it will take me some time as you know.

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Q I don't think that's necessary.

A And then the function of F and G would be evident but one is high and one is low and then we reverse that role and that, now how high and how low depends upon how you arrange those grid resistors in there, but in the current machines we have one of them at plus 110 volts, plus 100 volts and the other at minus 100 volts and then the role is just reversed and the thing stops adding and starts subtracting.

Q Now, if we refer to the Exhibit Y which was the test set, the physical test set?

A You want to run it?

Q No.

A All right.

Q The first question is the circumstances under which this test set was constructed, who initiated it and how you went about it?

A It was constructed along the line with the computing machine at the same time for the purposes, I think I told you this morning.

Q Yes.

A For the purpose of testing the add-subtract mechanism and getting them ready to go into the other computing circuit.

Q Now, you just said, I believe, there was no circuit

diagram of the original test unit extant, how did you select the circuit for this test set Exhibit Y?

A Well, look at that circuit there, you know we have the voltages on there and, of course, it doesn't matter exactly what voltages you use, as a matter of fact, this thing is operating in a plus or minus 100 volts or 105 volts or something close to 100, but they operate well up to 150, well, up to 200 volts if you operate them up there. So you just, you just arrange a power supply that supplies the positive 120, negative 120, and then you arrange the power circuit will supply you know how many tubes you got here and you got three-tenths of an ampere per tube, three-tenths times seven is two and one-tenths amperes so you got to get a source in there, and we got, it's extra heavy because we have to put in an extra little filament transformer in order to get the filament current. It happened the little transformer that we happened to find that would give the plate supply wouldn't give the filament supply so we had to add another transformer for that, and that's the things you ordinarily do in patching up electronic circuits, and then the thing is working.

Q What do you use to generate the signals to apply to terminals B, D and E in the test set?

A B, D and E? We use resistor networks.

Q Pardon?

A Resistor networks. On the -- we use resistive networks on the other voltages which we have present.

Q Well, and the switches or relays for keying them?

A Here, see these?

Q Those buttons change the resistive networks?

A They switch, as a matter of fact, we have two resistive networks, one at a suitable voltage we call high voltage, one giving a suitable voltage called low voltage, but the input impedence of all circuits is so high that loading them on doesn't make any difference. So all you have to do is to just switch from one to the other so these are single pull double throw switches here that you have at the top. And then you switch them, switch the lead in question from one to the other.

Q Do you have a circuit diagram of that test unit?

A There is one somewheres, but it is certainly in Mr. Kirkpatrick's possession. I may have one in my possession and I would be glad to look for it, if you please.

Q May I ask --

A You can ask questions about it.

Q I would like to see a copy of it and I would like --

A I haven't got one here.

MR. DODDS: Mr. Fallon, could you make a copy available to us? Or Mr. Halladay?

MR. FALLON: In this respect, I am

counsel for Dr. Atanasoff --

THE WITNESS: If I have one --

MR. FALLON: We can make it available. I have none.

MR. DODDS: I understand that.

THE WITNESS: I am not sure I have one, but I could also take this apart and make up one. That would be another possibility. If I have one it was made by a -- it was made towards the end of the process of producing this and was made by a technician in the employ of Mr. Kirkpatrick, and I am sure you can obtain one from Mr. Kirkpatrick. I think that would be the logical source unless you desire me to supplicate Mr. Kirkpatrick to give you one.

Q Well, actually, counsel for defendant is in sort of an anomolous position because you are the witness at present for the plaintiff Honeywell and I don't know whether you are under subpoena or not, but I don't know whether you have been asked to bring these documents. I don't have any power to require you to bring these documents.

A I was told what was needed here and I brought it as far as I knew, and maybe not successfully in all cases, but I tried to bring the documents.

MR. DODDS: If nobody has any objection I would like to make a request that the witness

supply his counsel, Mr. Fallon, with a copy of this circuit diagram, who then may supply it to both parties.

MR. FALLON: All right.

MR. HALLADAY: That's agreeable.

BY MR. DODDS:

Q Now, Dr. Atanasoff, when you were describing these exhibits Y and Y-1, you referred to the fact that the interconnecting cable and plug had apparently 12 leads while there were 10 on the original as appearing from the photograph?

A I knew that would come back to roost.

Q So what I would like you to do, I don't know that Mr. Halladay has any objection, I was going to suggest that you indicate on Exhibit X where those 12 leads went?

A Well, I can. Suppose we first count the leads on Exhibit X, count the leads on Exhibit X?

Q All right. I did count them and I got, I believe, 10 or 9, but there are no leads shown for the filaments?

A Well, then that means 10, 11, doesn't it? Two leads for filaments?

Q It depends on whether the ground went up --

A We wouldn't mind grounding one -- and I might tell you that in the original set the filament was grounded.

Q And in this set is the filament grounded in one side?

A It is not.

Q It is not?

A No, it is not.

Q That counts one extra terminal?

A Yes. And I don't know about the other one, but my count -- in the course of building this, somebody got loose with one of the leads and I don't know what happened there so I would have to just research that for you, but because he had it because the ones we could buy now happen to have that many leads.

Q Well, could I extend my request to a certain diagram on the test unit plus a circuit diagram of the interconnection of the test unit to the Exhibit Y-1 since it seems to have at least --

A I am resisting slightly because I am a busy man and I can spend a day or two if counsel is willing to pay for it, I would be glad to furnish him with this material.

Q I understand you thought you had a circuit diagram?

A Suppose I don't have? I am only resisting for that reason, otherwise you are certainly welcome to the material. That's the only objection I have.

Q Under the circumstances would you -- I think frankly there might be some conflict if you were working both sides of the street?

A I am not going to work both sides, and I promise you I will not be working for Mr. Halladay when I am working

for you.

Q I think that might be a little problem. I would like to have what you have available. What you don't have available we will jump off that bridge when we get to it.

A All right. Good enough.

MR. DODDS: Is that clear, Mr. Fallon, to the extent there are diagrams of the test unit and interconnection with the ASM unit, they will be supplied --

THE WITNESS: I would think that --

BY MR. DODDS:

Q I am sorry --

A Pardon me --

Q They will be supplied and if not available you will let us know?

MR. FALLON: Fine.

BY MR. DODDS:

Q Now, the next question is with respect to Exhibit Y-1 but I believe, you can assume the questions are the same as to Y, the answers would be the same as to how it was constructed and so forth?

A I counted --

MR. FALLON: I don't know if that's the question. What is the question?

MR. DODDS: I will be more specific if yo

wish.

BY MR. DODDS:

Q Relate the circumstances under which you constructed Exhibit Y-1?

A The same.

Q And where were units Y and Y-1 actually physically constructed?

A In my home.

Q And were they constructed by the same personnel you identified previously that was working on the machine?

A They were.

Q Dr. Atanasoff, before testifying at this deposition, had you read any of the depositions, previous depositions that were taken in this case and/or the Control Data case?

A I have read, let's see, I have read Legvold's deposition, Laura's deposition.

Q Mrs. Atanasoff?

A Yes.

Q Dr. Mauchly's deposition?

A I have read Mauchly's deposition, original deposition there but not the one in this case.

Q Control Data case?

A Right.

Q Butnot in this case?

A Right.

Q Did you read Mr. Trexler's deposition?

A No, I didn't.

Q Mr. Davis' deposition?

A No.

Q Mr. Griffen's deposition?

A I would have to examine my files. I may have seen Mr. Griffen's deposition. As I remember it was very short, wasn' it?

Q It was short. Yes.

A I probably saw that one, yes. I think it would be a fair guess that I think that counsel supplied me with a copy and I read it.

Q Have you happened to read the original complaint in this lawsuit?

A No.

Q Did you ever read the amended complaint in this lawsuit?

A No.

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Q Dr. Atanasoff, in the back of folder No. 1 there were some reproductions of a number of technical publications from technical journals, including some in which you were the author or co-author and some in which your graduate students were authors.

MR. FALLON: Folder 1?

MR. DODDS: Folder I, I am sorry.

Capital I.

BY MR. DODDS:

Q Do you recall whether you have published any other articles in technical journals?

A Well, I don't have any immediate way of telling. I would have to check my entire publication list. I would have to see how it corresponds with that. I don't really remember what got into ithat, Mr. Dodds.

Q Well, maybe you had better look.

A That will help, but --

Q Do you recall any other technical publications of which you may have been the author or co-author?

A Is the one by Brandt and myself in here?

Q Yes.

A It is? I just remembered that because I have been going over it lately. It is not in my set here, but it's in yours, is it? There it is, isn't it?

MR. FALLON: No. That is Research

Foundation.

BY MR. DODDS:

Q That is the Journal of the Optical Society of America?

A Yes, you have got it. I don't really --

MR.HALLADY: Do you have a number on it?

MR. DODDS: 1613.

THE WITNESS: I don't really know. Now, I know that my publications were from the era back there because since that time I have been employed by the government and I have been employed in other places where publications are not current, so I will just have to look and see.

Q Do you remember publishing an article in The Journal of Meteorology?

A Yes, I do seem to remember that. Yes, I do.

Q And do you remember what the subject matter was?

A I imagine it was my Helgoland expedition, wasn't it?

Q Yes, it was. Do you remember who were, if any, were co-authors?

A I don't remember. I know it was my group that did the work.

Q I might -- I think it's fair to say, Dr. Atanasoff,

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this is only a question of memory test. It is not a question, the subject matter is not relevant. I just want to see how much you remember.

A Yes. Well, you know, I am not doing too well, maybe.

Q Do you remember -- I will give you the title which will give you a clue. The title was "Upper Atmosphere Temperatures From Helgoland, Big Bang." Does that ring a bell?

A Yes, it does.

Q You don't remember who the co-authors were?

A I know there is a man named Daubrin on there probably.

Q And do you remember anything about the substance of the discussion on this article?

A Why sure. I have no trouble on that. It's the other stuff that I am likely to forget.

Q Well, --

A This analyzes the transmission of the sonic waves through the atmosphere from Helgoland to the various receiving points which we had at that time, and analyzes it with a purpose of determining the nature of the atmosphere above the surface of the earth.

Q Do you remember what sort of equipment you used to measure these?

A Well, I built it with my own hands.

Q I am sorry?

A I almost literally built it with my own hands. The design came out of my mind and almost in the main my mind.

Q What did you call it?

A Microbarograph.

Q And do you recall discussing in this article Guttenberg's conception of sound ray paths?

A Yes.

Q And what was your conclusion with respect to Guttenberg's conception?

A I do not remember this. I know GGutenberg pretty well.

Q Do you remember, Doctor, publishing a technical article in an electronics magazine?

A Well, let's see. If I published an article in an electronics magazine, I would say it was on an experimental electronic chassis, is that right?

Q Pardon?

A An experimental electronic chassis. Have I guessed wrong?

Q Well, partly right. Again, I will give you a clue. It was called, the title of it was "Modern Bread Board Chassis."

A That's exactly what I mean.

Q And do you recall who were the co-authors with you

on that?

A Snavely and Brown.

Q Do you recall the general subject matter?

A Sure. I have one of them at home and I had my hands on it in the last month, so I will remember it. Do you want to see it?

Q Well, it's not very much a test of your memory if you have had one in your house and looked at it in the last month.

A That's right.

Q Now, do you recall, I think you referred in your testimony, and I refer particularly to page 109 of the record about a PhD. thesis of one Robert Willson?

A I do.

Q And I believe you instructed the reporter very carefully that it was spelled with two "l's"?

A I believe that's right. Am I right or wrong?

Q Well, we will have to check that. If you will refer to the exhibit, I believe it is in folder A-2, documents 3, 2 and 3, which were the Christmas letters that went out at Ames, and I gather that these Christmas letters went out to present and ex-faculty and graduate students, and so forth?

A Well, I see I was wrong.

Q It was spelled with one "l" is that correct?

A Yes. I see that Professor Willson in the department

there was spelled with two "l's".

Q Yes. Will you just for context state briefly again the subject matter of the thesis of Mr. Willson?

A Well, he commenced an investigation of the dynamics of quartz crystal. I don't know whether I can give you a title that will be representative of his, but it's a question of determining the frequencies of vibration of a block of quartz, and he commenced that work, which was carried on by several other people in my laboratory at the time, subsequently by Hart.

Q Do you recall when Mr. Willson commenced his work on this thesis?

A I would think it was '34 or '35, maybe '36. I just foreget the year.

Q Do you recall when he completed the work?

A Well, he got a doctor's degree. He must have been on the work for a year or a year and a half or two.

Q You don't remember the year in which he received the doctor's degree?

A No, I don't remember that. I haven't attempted to memorize it or anything of the kind.

Q Now, I would like, if I might, refer back again to the chart which you drew, Exhibit N, Plaintiff's Exhibit N. If it will be convenient, you may refer to my copy.

A All right. I drew a chart purporting to show the

connections and arrangements of the work for Mr. Willson's thesis, and this method was also used by subsequent people.

Q Now, as I understand, this chart represents roughly the apparatus which Mr. Willson used in conducting the experiments on his thesis and that equipment illustrated on chart, Exhibit N, what part if any did you contribute and what part if any did Mr. Willson contribute?

A Well, it was a cooperative effort between us. I don't know what I should say to you under these circumstances.

Q Just the truth.

A Oh, that's not so simple, as you well realize, because the truth comes in many cloaks. I -- for instance, the idea of approaching quartz crystals this way was mine.

Q I am talking about particularly the equipment by which you --

A You mean -- of course, a graduate instructor does not in the main build equipment but he plans it for graduate students to build or he assists graduate students in planning to build it. Now, I am not hedging, but that's just simply the way it has to be in this particular case.

W-18-2

Q I was just asking as to this particular case.

A All right. I am going to try --

Q I am sorry.

A I am going to try to tell you. Now, I remember that I designed for Mr. Willson a precision condenser which is employed on the oscillator here, which I can give you -- if you have any source, I haven't looked up Mr. Willson's thesis, but I can make you a sketch of that oscillator, for instance. I haven't seen Mr. Willson's thesis, I haven't bothered to go look it up, but I can give you an almost precise description of that condenser at the present moment.

Q You say precision condenser. Was it a variable condenser?

A It was a variable condenser and it was a home made variable condenser, and it would be an interesting thing for you to have it. Perhaps you would like to have me draw you one and then you can take it and go back out to Iowa State College and look up the thesis and compare it, and it will help your confidence there.

Now, I would say that the general idea of how this apparatus was to work was my conception, and at times I helped Mr. Willson build the apparatus, but not in the main, no. He in the main did the work.

Q You referred in describing this and have indicated

on Exhibit N a box called Miller effect?

A Yes.

Q Can you just tell us briefly what a Miller effect device is?

A I bet I can. A Miller effect tube is a tube whose input impedence -- it is a tube arranged to vary the capacity of a circuit according to a voltage applied thereto. That's what a Miller effect tube is. That's the purpose of a Miller effect tube, to vary the capacity by a voltage applied thereto. Now, I guess I'd better have some paper.

Q Now, instead of using those charts, would you mind sketching -- I have some letter sized white bond paper here, which is easier for me, at least, to handle.

A Yes, I will be glad to. Now, the Miller effect tubes are made with pentodes and they are made with triodes but I am going to give you one made with a triode. Now, I want this to go in the record --

Q I will have it marked after you finish, yes, Doctor.

A All right. I am being a little bit careless, but otherwise than that, why -- I should get a --

MR. HALLADAY: Mr. Dodds --

MR. DODDS: I am sorry.

MR. HALLADAY: It is obvious that from time to time as the witness works on this drawing,

he will be more or less thinking aloud. I would be agreeable, if you are, to going off the record until he has completed the drawing rather than confuse it by thinking aloud that may or may not be meaningful when it has no question to respond to and no object to refer to.

MR. DODDS: That is agreeable.

(Discussion off the record.)

MR. FALLON: May we go back on the record, Mr. Sutfin?

BY MR. DODDS:

Q Dr. Atanasoff, would you, perhaps, apply some reference numerals to the various elements to aid in identifying them and then describe briefly that circuit?

A And how it operates?

Q And how it operates.

A Yes. This is a triode. Do you want an effective triode? Do you want me to enumerate a triode that might be used in there?

Q No, that's not necessary.

A Well, I could if you wished.

MR. FALLON: Like numeral 10, numeral 12.

BY MR. DODDS:

Q Numeral 10, 11, 12, that is all it needs.

A Okay. Do you want me to dictate a modus operandi of this device?

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EA

Q Whichever is most convenient. If you want to apply the numerals first or dictate or apply them as you dictate, either way?

A The Miller effect tube, the purpose -- let's start off this way: The purpose of a Miller effect tube is to develop a variable capacity which can be controlled by a variable voltage. This is accomplished as follows:

The variable voltage controls the amplification or gain of the vacuum tube. This tube may be either a triode or a pentode. It could be a four electrode tube also. Usually the variable input voltage employed on the grid is impressed on the grid. The variable capacity is also takenoff between the grid and the ground. This necessitates filtering to separate these two effects. In the drawing which I have constructed, a choke of suitable size, of suitable inductance -- will you correct that to inductance -- prevents the input circuit from unduly affecting the capacity at the operation frequencIes.

On the other hand, a condenser prevents the variable input voltage from reaching the variable capacity terminals. There is a capacity connecting the plate.

Q Excuse me, I was going to say -- could I interrupt --

A And the grid.

Q If you would put some reference like one, two, three or ten, eleven, twelve as you go along it would help I would

think.

A All right. All right.

Q You started out with a choke?

A All right. The choke is called number one. You want to make a list? There is a capacity C1 between the plate and the grid. The plate has a normal resistive load although any reluctance type load, any suitable reluctance could be used as load.

The capacity C2 prevents the variable input voltage from reaching the variable capacity terminals.

I believe that's good enough. That ought to do all right.

MR. HALLADAY: Did you use the term capacity C2? Capacity C2?

THE WITNESS: The capacitor C2, if you don't mind.

MR. DODDS: May I ask the reporter to mark this as Defendants' Exhibit DPX-5.

(DPX-5 marked for identification.)

BY MR. DODDS:

Q Now, still referring --

A May I make one change in that. It occurs to me that I can advantageously make one change. The capacity C3 is between the grid and the ground connection.

MR. HALLADAY: Again did you say

capacity deliberately?

THE WITNESS: The capacitor C3. And the capacity is also all right. I don't know, that doesn't make any difference.

BY MR. DODDS:

Referring back now to Exhibit N, the schematic or block diagram of the Willson arrangement, do you recall what sort of an oscillator was used, a Heising or Colpitts, what have you?

A We used Colpitts a good deal but any kind of feedback capacitor.

Q Do you recall what was used in that equipment?

A I do not particularly recall.

Q The same question with respect to the detector. Do you recall what type of a detector was used?

A It was an amplitude detector. I believe that the record shows it was an amplitude detector.

Q That's correct.

A And what was used there was a vacuum tube used as a diode in this device.

Q Do you recall when you last saw the documents containing a description of the apparatus in Exhibit N?

A Well, not since approximately the date which they were written. I haven't refreshed myself in regard to this for deposition in the slightest. You have got it, have you?

I will tell you what you let me do, you let me draw you a picture -- is there a picture in there of a condenser?

Q No. I don't believe so. I don't know.

A Well, look closely, and if there is I will draw you a picture of the condenser. I happen to remember that with great precision because I designed it myself.

Q I think not. Well, now, I believe you said, Doctor, that it was a later thesis by another one of your graduate students --

A There is work by Mr. Hart and Mr. Kammer in a similar -- oh, in the same subject.

Q Do you know whether -- Did they do theses, graduate theses?

A They -- each of these three obtained PhDs. in this subject.

Q Do you recall whether or not their theses were published?

MR. FALLON: What do you mean by published?

MR. DODDS: In a technical journal?

THE WITNESS: I understand it clearly. I am sure that there was publications came out of the two of them and I don't remember exactly. Well, let's see. I don't -- I know that either Hart or Kammer published their work and very possibly both of them.

BY MR. DODDS:

Q You don't have any distinct recollection of whether either or both did publish them?

A I believe there is a publication by one of them in company with me.

Q You don't recall though specifically what the publications were, if there were any, between -- of these men?

A You mean the titles?

Q Either titles or when they were published or where they were published or anything about them?

A They were published in those years and those years are between thirty -- let's see, they were between '36 and '42, and they are published in -- I believe they are published in the Physical Review.

Q Have you -- I didn't find copies of them in these --

A No. They were not there. I did not intend to put my publications in there and somebody got ahold of them and they brought a group of them up here and handed them to me, and I added them to them at the instance of counsel.

Q I would like to correct myself. There is a publication of the paper by yourself and Mr. Hart.

A Right.

Q In the Physical Review of January 1, 1941, included in your documents.

A All right. All right.

Q Now, and I think you mentioned that Mr. Kammer was one of the men that carried on work in the same general field?

A That's right, Irwin Kammer and Phillip Hart.

Q Now, do you recall just in what respect his work differed from that which Mr. Willson had done?

A Well, what happened was roughly this, and in that line of three theses, what happened was roughly as follows: Mr. Willson began by building the apparatus which I have outlined in that picture and which was used in the case of Mr. Willson by examining the spectra of quartz crystals. Then the other two men carried on a series of work. We developed theory and commenced to measure the elastic constants out of the quartz crystal and I can't tell you how many elastic constants there are, but in an isotropic media there are three elastic constants and in the quartz crystal there are, I believe, six or eight elastic constants, and I believe the number is six, but I am not quite sure. We commenced to measure these elastic constants and to measure the temperature coefficients of these elastic constants, and our work was first in this field and it was of considerable import.

E-19-2

Q You say we, you mean you and your --

A And my graduate students.

Q And your graduate students?

A That's right.

Q Now, do you have any recollection -- you have a very vivid recollection of the circuit arrangement which Mr. Willson used in his work, can you remember the circuit arrangement which Mr. Kammer used in his work?

A You see, Mr. Willson's was first and it was simpler. We refined the circuit in some respects, I am sure, of that, and I do not have any particular memory of the difference.

Q You wouldn't be able to draw --

A No --

Q A chart similar to this for Mr. Kammer's?

A I am not sure I couldn't if I sat down and thought over exactly what Mr. Kammer's problem was and attempt to design a circuit for that, but that wouldn't be quite fair, it's just not simply a matter of memory for me from that day.

Q Was there work of Mr. Kammer's which later appeared and perhaps this is a good time to have this marked, a copy of this marked as DPX-6, marked for identification, and the title is, "A Determination of the Elastic Constants of Beta-Quartz," by E. W. Kammer and J. V. Atanasoff, appeared in the Physical Review, October 1 and 15, 1942, pages

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395 to 400 inclusive.

(DPX Exhibit 6 marked for identification.)

BY MR. DODDS:

Q Would you look briefly at the figure, the circuit diagram at the top of page 396?

MR. FALLON: The schematic diagram Fig. 1?

BY MR. DODDS:

Q I was going to say both Fig. 1 and Fig. 2, and can you state briefly in what respect this equipment differed from the equipment which Mr. Willson was using?

A Not much. Not much.

Q Can you be a little more specific?

A Well, not much. There were only minor refinements and you see in Figure 2 there we have the 60 cycle input current used to swing the Miller effect tube which is at the left of the bottom of the picture, and on the Figure 1 it's called the frequency modulator there. Now, this feeds into the, directly into the -- I am sorry. I have got this wrong.

The first tube on the lower line, I mean the right-hand tube on the lower line is the Miller effect tube. The left one is the oscillator. Then this feeds through the furnace and through the crystal to the -- through

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to the buffer amplifier and then to the detector, and in this case we are using a triode detector and not a diode detector.

Q Now, I would like to read into the record the first few sentences of the introduction to this article by yourself and Mr. Kammer. It says, "A new technique is described for quickly locating and measuring weak resonance points of a plate of piezoelectric material. The method involves driving the resonator with a frequency modulated carrier and demodulating and amplifying a voltage related to the motion of the resonator. The output of the amplifier is placed on one set of plates of an oscilloscope and the other plates are charged with the modulating voltage. The resulting pattern on the oscilloscope screen permits easy location and measure of resonant frequencies."

Would you tell me in what respect what I have just read differs from the arrangement of Exhibit N?

A Not very much.

Q Well, not very much --

A Is there any difference?

Q Is there any difference ?

A I recognize none. We used a pattern here and we used it to -- of course, we will have to find some way of measuring it, of localizing the frequency of the oscillator, but this is an ordinary frequency measuring apparatus.

Q Just a minute. I am just talking now about the

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language I read from the introduction which is in fairly general terms?

A I don't pick up any difference. There may be a difference but I don't pick it up.

Q Do you know any reason why --

A Will you let me read it myself instead of you?

Q I am sorry. Yes. Certainly.

A I would say this is exactly the same method as Mr. Willson.

Q Do you know any reason why Mr. Willson wasn't given any credit in this paper? There is a bibliography referring to work of -- excuse me, I only find one -- no, there are several prior articles referred to but not Willson's?

A Not from Mr. Willson?

Q No.

A I am not sure. I am not sure.

Q You don't know why?

A Well, probably inadvertence. I would say inadvertence. Well, "Edge effects were eliminated by the use of high harmonics as described by Atanasoff and Hart." Of course, that was done in the Kammer paper. Now, I should have told you --

Q Excuse me, I don't believe there is any question before you at the moment.

A All right.

Q And we come to a different subject, Doctor. I refer you to your chronological list Exhibit DPX-4 and if you will look at page 36 of that list you will find a reference to sending copies of the manuscript 455 or 456 to Mr. Warren Weaver and to CSAL?

A Right.

Q On the respective dates of -- I can't read it from here?

A 21 and 22 of August, 1940.

Q Now, in the list I find no reference to sending a copy of the manuscript to Mr. Poillon of Research Corporation which I believe was in November of 1940. Do you know of any reason for that omission?

A I know of none.

Q Well, I understood that this was prepared by -- as a collection of dates which you supplied from your documents and dates which were supplied by counsel?

A Yes. But if the date is missing it just means that somebody goofed and that may well have been me that goofed, I am not sure.

Q Yes?

A But somebody goofed.

Q On page 64, I believe at the bottom, there is a reference under the date of 1953 to a Sperry Rand report issued. Do you know what that refers to?

A I do not.

end

W-20-1
6

Q Would you look at page 42 of the notes?

A 42?

Q 42. There is a reference at the bottom, "Late 1940." Would you read it? I can't read it.

A "JVASA: 'Computing Machine for the Solution of Large Systems of Linear Equasions'", and I suppose this refers to the manuscript.

Q Well, would you continue with what it says?

A "(Unpublished) plus financial statement; 31 pages plus 2-page financial statement."

Q Do you have any idea what the meaning of that entry is?

A Of what entry?

Q That you just read?

A I thought that exactly described one of these two green booklets which you have here.

Q Well, but you told us those were typed in August of 1940?

A Oh, I see. Well, it just happened they were typed in August.

Q Did you have any knowledge of what that entry means?

A The entry just meant August, that's all, as far as I am concerned.

Q In late 1940?

A Yes. Somebody said late '40, and then later the date was determined as August.

Q Well, is it your impression that that entry refers to the issuance of the manuscript as represented in Exhibits 455 and 456 in August, 1940?

A I believe it does.

Q You may recall, Dr. Atanasoff, that earlier in your deposition there was some exchange about your reference to these notes and I think that --

A My what?

Q There was some reference, there was an exchange between counsel or you and I with respect to your reference to these notes, and I think the last time you indicated thatyou had not referred to it and I think you had not referred to it during yourdeposition.

My questinn was, have you referred to these notes during recesses in the depositions?

A That's a good question. I believe almost not. I might have looked up a record, but I would say for all practical purposes, I haven't stayed at home nights and memorized these notes or anything of the kind, no, sir. I won't say that there hasn't been something that occurred to me that I might have looked up in this document.

Q Yes.

A While we were probably right in this room in your

presence or during the lunch period or something of the kind. This book has been here.

Q Yes. Now, I think there's one final question. I want to refer you to two places, to pages 31 and 66.

A In this book?

Q In that book, yes.

A 31 first?

Q Yes, and, well, 66, I think you can maybe sort of put your finger in there and look at both of them.

A Yes, I will. Okay.

Q In each, it looks as though there is some material at the extreme right-hand edge which was, which indicates that the reproduction is from some different sheet and that some portion of it was blocked out. Do you know what that represented? Do these notes come from a pamphlet used by your counsel, Mr. Halladay?

A I believe they came from some such source, yes.

Q Would you look at folder F-1-A which are the photographs 1402 to 1419, I believe.

A These photographs?

Q Yes. My question is, you may recall that you had put on the reverse of these, certain notes as to their dates--just a minute.

A I am sorry. I am sorry.

Q Dates and sources. Can you identify the sources and

dates of those photographs without reference to the notes on the back?

A I see what you mean. Yes, I can, because the dates are on the front.

Q Someone has moved them to the front. I guess the sources are not identified. Somebody has moved the dates to the front.

A Yes. Now I can tell you quite closely the sources. The dates would give me a little bit more trouble, but I will be glad to try it with a set that's different. You take my set.

Q All right.

A The first two --

Q And if you will describe them. Then I will give or maybe your counsel can then give the number to the reporter which I think is on the back.

A The first two --

MR. HALLADAY: The number, please?

MR. FALLON: 2 and 3.

MR. DODDS: 1402 and 1403.

THE WITNESS: The first two were found by me as prints in an envelope.

BY MR. DODDS:

Q Where?

A In my files, and they have come from the very day.

MR. FALLON: The legend on the reverse of 02 is "From print in JVA files," and the same legend is on 1403, reverse side.

BY MR. DODDS:

Q You had, I believe, three there.

A I am sorry. I didn't mean to have three. I just had three by accident.

Q Just turn them to keep them in order.

A Now, they were rather early in the construction of the machine, and some time in 1940, say in the middle of 1940. These photographs here --

MR. FALLON: This would be 1405, 1406, 1407 and 1408.

THE WITNESS: These are from the manuscript and they were taken specificallyfrom the manuscript and their date is August of '40, maybe slightly before that.

BY MR. DODDS:

Q You mean these are reproductions of photographs actually --

A They came to me in the manuscript.

MR.FALLON: The reverse side of 1405, 1406, 1407 and 1408 each baars the legend, "From booklet JVA files, 8-7-40."

THE WITNESS: Now, these three were in Clifford Berry's thesis and they were taken for that purpose.

MR. FALLON: 1417, 1418 and 1416 in that order.

THE WITNESS: And Clifford Berry's thesis was done, oh, in July of '41

MR. FALLON: The reverse side of each one of these has the legend "From CEB, M.S., thesis, I.S.U."

THE WITNESS: Now, the last one was from a negative found in my files.

MR. FALLON: This is 1419.

THE WITNESS: And the date is perhaps May of '42. I don't know.

MR. FALLON: The legend on the reverse side reads, "From JVA file, 18 May, 1942."

THE WITNESS: And I purposely gave you that one first. Now, these other items are from -- there's one of them, and I believe this is the one. I believe this one is from Norman Fulmer.

MR. FALLON: This is 1415 and the reverse side says, "From N. Fulmer."

THE WITNESS: Now, the rest of these were obtained from Clifford Berry as prints, either -- and

negatives were made from the prints and they are in interim, well, they do not have dates. We do not have the original dates of any of these materials here but I can make guesses as to the dates for you, if you wish.

20-2 -1
WS KL

BY MR. DODDS:

Q No, I don't wish that.

MR. HALLADAY: Would you identify the numbers?

MR. FALLON: I will right now. These were in order, 1409, 1414, 1410, 1413 and 1412. On the reverse side we have --

MR. HALLADAY: Respectively.

MR. FALLON: Yes. "From CEB files" for 1409. For 1414, "From CEB album." For 1410, "From CEB files," for 1413, "From CEB album," and for 1412, "From CEB files."

MR. DODDS: Is there a final one?

MR. FALLON: Well, this is the 1415 previously marked over here from N. Fulmer.

MR. DODDS: I am sorry.

BY MR. DODDS:

Q Dr. Atanasoff, in what time period did you put these legends on the reverse of these photographs as to their dates and sources of them?

A You mean on the front?

Q The information, the notes here on the back.

A Oh, yes. How long ago?

Q Yes.

A I didn't actually put it, but I did it the same

time that I assembled this list of photographs.

Q Within the last two months?

A Yes, sir.

Q You referred to the thesis of a gentleman by the name of Gross, Cook and Thorne that did work under your supervision at Ames?

A Yes.

Q Were these theses published, do you know?

A Well, I believe there were publications resulting from those theses. I don't remember which one. I imagine that at least one of Gross' theses was published -- no, I believe Gross' wasn't by some strange -- it depended largely on the effort of the man who got the thesis whether the thing got published or not, and sometimes they got published and sometimes they didn't. I believe Gross' didn't, but I believe that maybe one of Thorne's theses got published. That's the way I remember it, but I am not sure.

Q How about Mr. Cook? Do you have any recollection about that?

A He may have got a thesis published, too.

Q You don't remember?

A I don't remember, no.

Q You testified that during your recollections of your earlier life about a slide rule which I believe your

father owned which was in a red case, I think it was a Dietzgen slide rule. Do you remember how that case was closed or fastened?

A It was a slip-type case like this, the parts slipped together.

Q Telescoping type?

A Telescoping type, yes, and that particular Dietzgen had another feature which I remember clearly that will interest you. It had a spring type instead of having screws at the back, it had a spring type adjustment so it was supposed to automatically apply the right tension. It didn't work very well but that was the design. On the other hand, the K and E that I mentioned at that time had screws in the back which are used for adjustment of the tension.

Q And roughly, as I recall about this same period, you referred to two booklets on radio telegraphy, which apparently were British?

A There was one on radio telegraphy and one on radio telephony. I can tell you that they were British. I can tell you that they had a very light green cover. I can't tell you the name of the publisher, however.

Q You said, I think, that they were priced in shillings and pence. Do you know, do you remember how many shillings and pence?

A Oh, I remember once thinking that they probably

were worth, oh, I imagine it would be a couple of shillings or something of the kind.

Q You don't really recall? You are imagining?

A Well, yes, I remember asking how much money it was, and then I have some kind of a transmission that it was of that order of magnitude.

Q You don't remember the figures?

A No, I don't remember the figures.

Q Do you remember the title page or the contents on the title page of either of the pamphlets?

A No, I do not, but I can tell you that the one on radio telegraphy dealt with a co-hearer and the one on radio telephony dealt with a detector which involved a platinum wire dipped into acid.

EA # 21/1
KL

Q I refer you to Atanasoff Deposition Exhibit T, you can use this copy if you like for convenience. Would you tell me just how this chart was prepared and by whom?

A I made some rough sketches of this chart. They were worked over by Mr. Call and the draftsman and they turned to me and I made additional suggestions and that's the way this chart was prepared.

Q And what was the source of information for the preparation of this chart?

A My memory, solely.

Q So the accuracy of the chart depends on the accuracy of your memory?

A I think that's a fair assumption.

Q Now, referring to this same prototype, I believe this is a representation of the prototype machine, is it not?

A Yes. This is not the -- Well, I guess this is -- all right, good enough.

Q I think that you testified that there were no circuit diagrams of that extant of the original prototype?

A Yes. You mean complete circuit diagrams?

Q Well, I didn't -- you correct me.

A There is in the files an add-subtract mechanism which I believe is this add-subtract mechanism. As a matter of fact, my memory is that it is this one. It's the only add-subtract mechanism of this character that I know.

Q But so far as you know, there is no circuit diagram of the complete machine?

A There is not. No.

Q Now, would you refer to Folder F2, documents 442 and 443. To the best of your recollection -- I am sorry -- have you finished looking at this?

A Do you mean this particular page 442?

Q 442 and 443?

A And 443. Yes. I believe 443 is the add-subtract mechanism which is used in the prototype.

Q Are you sure of that or are you just thinking that it may be?

A Mr. Dodds, I will state that this was the circuit used in the prototype.

Q Off the record I think you're safe. Let me check it.

A No. It's certainly not mine. I just had to wait and I don't like it either and I shouldn't use it in dealing with you people.

THE REPORTER: Are we off the record?

MR. HALLADAY: Did you go off the record?

MR. DODDS: I suggested it but I don't care.

MR. HALLADAY: Well, when counsel makes a concession, it seems to me I am entitled to have it on the record, and I think the witness is entitled to it.

MR. DODDS: If he wants it on the record certainly it can be on the record.

MR. HALLADAY: Well, is it on the record?

THE REPORTER: Yes.

MR. HALLADAY: Thank you.

BY MR. DODDS:

Q What was it you wanted to say, Doctor?

A I am sorry that I have the method of speech of a scientist in which you always express deference and never express assurance and it's gotten me into trouble before.

MR. DODDS: Mr. Halladay, the reporter asked if we could adjourn at 4:30 and it's a little beyond that. I don't know what your wishes are. I don't know whether it's possible to make any plans as to how much longer this deposition is to go, whether we can finish up tomorrow or not. Could you give any indication of the estimate of the amount of redirect you may have?

MR. HALLADAY: I have none at the moment that will consume any time.

MR. DODDS: Then it is agreeable that we adjourn until tomorrow and we probably can finish up easily. I don't have too much more but I expect perhaps another hour.

MR. HALLADAY: Very good.

(Whereupon an adjournment was taken until 9:15 o'clock A.M., December 6, 1968.)

EA#1
KL

VOLUME IX

UNITED STATES DISTRICT COURT

DISTRICT OF MINNESOTA

FOURTH DIVISION

Honeywell, Inc., Plaintiff,	:	
-vs-	:	4-67 Civ. 138
Sperry Rand Corporation and Illinois Scientific Developments, Inc., Defendants.	:	

Continued deposition of Dr. John V. Atanasoff taken by Plaintiff, before Earl G. Anderson and Ward L. Sutfin, Notaries Public, State of Minnesota, County of Hennepin, at 2515 First National Bank Building, Minneapolis, Minnesota, commencing at 9:25 o'clock a.m., December 6, 1968.

(APPEARANCES AS HERETOFORE NOTED)

Whereupon,

DR. JOHN V. ATANASOFF,

a witness having been previously sworn, was examined and testified further as follows:

CROSS-EXAMINATION (Continued)

MR. HALLADAY: All right, I guess you wanted to say something, Dr. Atanasoff, about Mr. Fallon?

THE WITNESS: I have two statements to make. Mr. Fallon was called to Chicago last night by pressing business and will not be here today. I explained to him I thought we could make out without him, and I have the following additional names to read into the record for the counsel for defense.

MR. HALLADAY: Is this in response to that earlier question about persons with whom you have discussed something or other within the past three years, is that it?

THE WITNESS: I would like to have the exact question restated and I couldn't be quite sure that I read it. Can counsel for defense state the question or rephrase it to his satisfaction so it will be before us, and I can respond to it further?

MR. HALLADAY: I have it in my notes

that it came right after a reference to Atanasoff Deposition Exhibit B-3, Exhibit No. 27. You made a reference to the prior transcript page 253, then followed the sequence of questions about having left Ames in September of 1942 and the condition of the machine and what it did or didn't do.

Then my notes say the question was: With whom have you discussed ABC in the last three years? Now I am not sure that's correct.

MR. DODDS: I believe that is correct. I was referring back to my notes so I would ask the question in the same manner and that is approximately what I had in mind.

THE WITNESS: Will you restate the question and let me further respond on that basis?

MR. DODDS: Yes.

BY MR. DODDS:

Q Dr. Atanasoff, with whom during the last three years have you discussed ABC --

MR. DODDS: Will you strike that. I will repeat the question. We have found the original question and then there won't be any doubt about it.

MR. HALLADAY: Give me the page?

MR. DODDS: Page 1066.

W-2

BY MR. DODDS:

Q "With whom have you discussed the ABC computing machine within the last three years?"

A I gave some names at the time you asked that question originally. I will not repeat those names. They are in that record. I now give you some further names: Mr. David Beecher, Mr. Robert Ellbourne --

Q Excuse me. With these names would you indicate their present whereabouts so far as known to you?

A Sure. Mr. Davis Beecher of Rockville, Maryland. Mr. Bob Ellbourne of Washington, D.C. Mr. Ernest Kolsrud of Frederick, Maryland. Mr. Calvin Mooers of the Boston vicinity, I don't know exactly. I guess I have it at home, but I don't have it here. The Berry children in addition to Mrs. Berry. Mr. R. G. Vail of Palo Alto, California. My children. I think that runs me down again.

Q Thank you.

MR. DODDS: Initially, Mr. Halladay, I think it was after the close of the record yesterday, I asked for a copy of the document identified as DPX-4 a chronological list of notes. I would like to ask whether or not we may have a copy of that?

MR. HALLADAY: Mr. Dodds, my present view is that that document reflects a considerable effort in establishing a chronology, and while we have

freely consented to your referring to it in connection with your cross-examination of Dr. Atanasoff, even though his reference to it during direct examination was as stated by him, it isnot suitable to give it to you for purposes of reproduction and retention, and I therefore respectfully decline to give you a copy.

MR. DODDS: I understand that on the basis that it is a part of counsel's work product in connection with this case, or what other basis of refusal?

MR. HALLADAY: No, I think I have stated my basis.

MR. DODDS: Well, then, I would like to make a statement. The witness appears to be in a somewhat anomolous position in that he has been subpoenaed, been called here, I presume, as a fact witness, but from the testimony, it also appears that he has been retained as an expert consultant by counsel for the plaintiff, and therefore, understandably has been aiding in generating work product papers.

The problem presented is, however, that the witness testifying as a fact witness and not as an expert witness has made reference to these notes, and as such, I believe in order for the record to be complete and understandable, the notes to which he has

made reference in his testimony be a part of the record, and, of course, if it is a part of the record, then counsel are entitled to copies.

There is the further problem that insofar as there may at one time have been a right of exclusion of this document on the basis of work product, it is defendants' position that any such right of exclusion has been waived by showing the document to the fact witness and to counsel for defendant who at least on one occasion and we think others, referred to it in connection with his testimony.

Therefore, we believe that counsel for defendant are entitled to copies of the document and that it should be made a part of the record.

I assume that does not change your decision, Mr. Halladay?

MR. HALLADAY: No, it does not.

MR. DODDS: Then I will just have the record show that the defendants reserve the right to call upon the Court for the production of the document at a suitable time.

MR. HALLADAY: I understand, and you do also understand that I had had Dr. Atanasoff write his own handwritten signature on the face of this so there could be no question about what it was

we were talking about in the event it did not get marked as a defendants' or plaintiff's exhibit.

MR. DODDS: And, of course, as understood, I am sure that the document will be preserved.

MR. HALLADAY: Oh, definitely, you have my personal assurance of that and it will be preserved in my possession so there could be no possibility that it gets outside the jurisdiction of this court.

MR. DODDS: Thank you.

BY MR. DODDS:

Q Now, Dr. Atanasoff, I think late yesterday --

MR. HALLADAY: Excuse me. Just for the record, DPX-5 has been Xeroxed and we have kept a copy of same and given a copy to counsel for defendants and the original is being tendered to the reporter for custody.

MR. DODDS: Thank you.

BY MR. DODDS:

Q Yesterday afternoon you referred to a thesis of Robert G. Willson which was done or prepared under your supervision, and I think you referred particularly to a figure in that thesis. I would just like to ask you to identify this, state whether you can identify this as a copy of Mr. Willson's thesis, the cover sheet bearing your

signature?

A Should I examine this?

Q To the extent that you wish. Can you identify it as a copy --

A I so identify it.

MR. DODDS: I would like to have marked as Exhibit DPX-7 the thesis identified by the witness and I would like to have permission to withdraw it to make copies for counsel for plaintiff because that's the only copy I have.

(DPX-7 marked for identification.)

MR. DODDS: I might also state for the record that on the face is a stamp. It states, "Received November 27, 1968, patent department, St. Paul," put on by a representative of the defendant inadvertently. That obviously has been added to the document.

MR. HALLADAY: I have no objection to the process employed and suggested here, and while I haven't checked, I assume there is no problem of authenticity. It appears to be a Xerox copy of a manuscript withdrawn from the Iowa State College or University library and I assume you can supply whatever is necessary to validate that, and I don't insist on that.

MR. DODDS: Thank you.

#3
EA
pg.1

BY MR. DODDS:

Q Now, Dr. Atanasoff, you may recall that we were talking about the manuscript Exhibit 455 and particularly the duty cycle of the switch S3, and one of the questions I believe was to identify the portion or portions of the manuscript which described the duty cycle of the switch S3, and I believe the record shows that you asked for some time to reflect upon that matter?

A I have not done this. I forgot to do this and I have not done it. I don't know what course should be followed here. Would you like me to take time off now and search the manuscript in order to find same?

Q Why don't we, if we can, perhaps, conclude the main questions and leave that as the final item.

A I don't know whether it's in there or not. I am amazed that everything I can think of is in there but we have spent long periods of time looking for things and then finally it's in there and it's amazing how much is in there, and I am dumbfounded by that. I don't know how counsel for the plaintiff feels.

Q Well, if it's agreeable --

A Counsel for the defendant.

Q If it is agreeable we can pass that at the moment and perhaps at the conclusion --

A I will spend the night tonight working with you on

that.

Q Let's leave this to the conclusion and see what we can come to.

MR. DODDS: I am sorry. Excuse me. We seem to have lost a document at the moment.

BY MR. DODDS:

Q In connection with this same subject matter of your discussions about the ABC machine with others, at page 1067 of the transcript I asked if there was anyone else at Iowa State and you answered, "I am thinking of one man by the name of Robert in the computing division by the name of -- " and I interrupted and said, "Perhaps his name isn't important. It's someone in the computing section at Iowa State University?" And you said, "Yes." My question is could that have been Mr. R. K. Richards?

A No. It is not.

Q It is not?

A No. Mr. Richards is a freelance writer and has no connection as far as I am aware with Iowa State University, for your information. I am trying to think of the boy's name. That would be the simplest thing. I will think of it.

Q Still on Mr. Richards, at page 236 there is a reference to a document No. 49 which I, for convenience, you can look at my copy if you wish. It was a letter received by Mr. Richards from Mr. Berry, and I asked you a question:

"From what source," the record says course, but, "From what source did you obtain No. 49?

"Answer: I received this copy directly or indirectly from Mr. R. K. Richards." I notice that that document in the lower left-hand corner includes the initials J.B. which I presume identify documents you obtained from Mr. Berry's files, is that correct?

A I am positive that I have received a copy from Mr. Richards. Now, I may have also received one from Jean Berry and by some accident this may be that copy. Remember this letter was also written by Mr. Berry and her initials may have been placed on there at the time that it was written. I don't know why they should be, but that is an alternative possibility. Let's see --

Q Did you find --

A Let's see if this one is a signed -- well, it is not the signed copy so it must have come from Mrs. Berry obviously. I say that is the correct answer. I have a copy that came from Mr. Richards for certain in my files somewhere.

Q For convenience I show you my copy of Exhibit 107 from folder B-13, a letter to you from Mr. Richards and it is addressed to you as President of Cybernetics, Inc., would you tell us what sort of -- what is the organization Cybernetics, Inc.?

A Cybernetics, Inc. is a corporation that was closely

held, a Maryland corporation which was closely held by, at various times, by myself, by Mr. Robert Gathers and currently by my son. At the moment and for some period it has been inactive. It did some -- I don't know, say a hundred thousand dollars worth of business, perhaps, just for the sake of discussion.

Q What -- I am sorry?

A During the early sixties. Go ahead, inquire.

Q What is or was the nature of its business?

A It was a consulting firm.

Q Consulting engineering, I assume?

A It did consulting engineering in automation.

Q Were you the president of that concern during its existence?

A Yes, I was.

Q Are you still president of it?

A Yes. The firm is inactive currently, has been for some years.

Q Now, coming back to Mr. Richards, would you relate briefly the history of your contacts with him so far as you can recall them from their inception?

A Well, my contacts with him have not been extensive. I have received one or two letters from him. I have received, I believe, one telephone call from him. I have seen him once and I have written him one letter and received a reply.

Q And over what period of time did these contacts extend?

A Oh, goodness, it's a period longer than this litigation. I guess it goes back to '65, perhaps. The date in his book would give us a clue because he called me when he was working on his book.

Q Perhaps the exhibit 104 from folder -- 104 and 105 from folder B-12 would refresh your recollection? This appears to be a letter, copy of a letter from yourself to Mr. Orr at Iowa State?

A That's right.

Q And if you will refer to the first paragraph perhaps that will refresh your recollection?

A Yes. Well, that's as far back as '63. Good.

Q And could you tell us anything of the substance of the conversation with Mr. Richards at the time of the call referred to in this letter?

A Well, Mr. Richards -- I might just respond fully on this and then you can ask me additional questions. I haven't any reticence about it. Mr. Richards has a history, he is son of a judge, he is a -- he has worked in the computing machine field and I believe with IBM. He is currently a free-lancer in IBM publications and makes his living thereby, and he come upon -- he come upon the conclusion that, gathered by himself from sources which are at least in part unknown to me,

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that there was a story about the origin of the computing machine and he was digging it out. And he had been to see Mr. Berry. That's as far as I know his source of information besides myself, and he called me and asked for help as I stated in that letter to Mr. Orr. I didn't respond very well to his request for help. I don't know whether I gave him any. I may not have given him any. At any rate I gave him only cursory help over the telephone, I expect, and that's the beginning on the story anyway. You want to further inquire?

Q Did he indicate during this conversation what prompted him to make the call or why he wanted the information?

A He wanted me to help him confirm that the origin of the computing machine did not rest with current credited people, persons.

Q And why was he trying to establish that, do you know?

A That's his business, I presume. I don't know. If that's not it I don't know why -- he was trying to do it as a publisher of books, and you have, well -- again inquire.

Q Dr. Atanasoff, yesterday you may recall that there was some discussion about the absence of any publication of your work at Iowa State, and I think you indicated later that your motivation with respect to recognition of that work had undergone a change, and I asked you when that change came about, and you said you desired some time to reflect on the

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matter, and so I come back to the question, do you recall when the, your motivation for seeking recognition of your work at Iowa State on the ABC computer changed?

A There have been a number of factors, of course, For a number of years there was no particular thoughts on the subject on my part. With the presentation of the claims in the two patents in current litigation, I commenced to feel that the record needed changing.

Q Well, then, is it correct that up until the commencement of the present litigation and the Control Data litigation it had not occurred to you that it would be desirable to seek any public recognition of your work at Iowa state on the ABC computer?

A I didn't say that.

E-3-2

Q Then correct me?

A This was a factor, this is your deduction, sir, it is a factor. It certainly is a factor. I would say it's a substantial factor in what happened. Of course, there are other events through the years that have moved me. I was somewhat moved by the IBM approach but in view of the IBM's failure to follow through on that approach I came to the conclusion and decided that their statements to me were erroneous, and I therefore felt at east about that information, but now I -- but when I read the patents and had counsel explain what the meanings of the claims therein was, then there was a refreshing of this feeling on my part.

Q Of course that was after the commencement of this litigation?

A Yes, that was. Yes.

Q Now, were there any other events prior to the commencement of this litigatinn which caused you to change your point of view with respect to publication?

A Yes. There was a discussion or two on the subject with Clifford Berry in his late years.

Q Approximately when would that be?

A That would be in early 60's.

Q Did you discuss with Mr. Berry the question of obtaining publication of the work at Iowa State?

A Well, there was nothing fixed like obtaining

publication. The question was securing recognition and not obtaining publication, and the discussion was relative to that.

Q What was Mr. Berry's attitude with respect to obtaining recognition?

A His attitude was a very strenuous one.

Q I am sorry?

A His attitude was a very strenuous one.

Q In which direction?

A Towards aggressive action in favor of the ABC in all directions and on all hands.

Q Well, in -- by what means or what means for obtaining recognition other than by publications were discussed or considered?

A There was discussion of litigation.

Q What kind of litigation, against whom?

A I cannot furnish definite information. I don't remember any particular type of litigation. I don't know what form it would take or anything of that kind. I can't furnish you details on that. I think that this was an exploratory discussion.

Q Do you recall any other events prior to the commencement of this litigation in which -- which caused you to feel that steps should be taken to obtain recognition of the ABC work -- ABC computer work?

A Of course, I hadn't -- I had at this time -- at the time I was talking to Clifford Berry, I had no information of whe e the thing stood so I couldn't respond to Mr. Clifford Berry in any way. I want to put that in the record. I had no knowledge as to the actual character of the two patents in the current litigation.

E-4-1

Q Well, do you recall any other events of which you yourself have personal knowledge other than your conversations with Mr.Berry and the contacts from IBM which caused you to change your attitude towards --

A You see, a man's mind doesn't work like a computer machine and I can't go in there and tell the factors which actually gave vent to this, and you are asking me to do that. I have enumerated some, and I believe there are others. For instance, I can name one other that certainly was an influencing factor and that was Mr. Richards' book, a little, just a little bit there. He had -- now I am through.

I mean, I can't think of anything other substantial that I can add to that.

Q Thank you. Now, still on this ABC computer, you have given a number of names with whom you have discussed this subject during the last three years. Can you recall any individuals with whom you discussed it prior to this three-year period, and I am meaning in recent years, not the 1941-42 period.

A Well, I discussed it with Clifford Berry and with R. K. Richards, as you know, over the telephone, not in the last three years. Now, I discussed it with Mr. Etienne. You have got my whole file. Everything is there. I didn't withhold anything.

Q You do not recall any, for example, oral discussions or telephone discussions with others other than reflected by the documents in your files?

A I do not recall such.

Q Now, Dr. Atanasoff, in going through your files and identifying a number of the documents, there were quite a few which I think you said appeared to be carbon copies of letters written by you, and I believe you testified as to the signing and mailing of these letters to the addressees on or about the times indicated.

Now, was that identification based on your customary practices or was it based upon specific recollection of each of the individual documents?

A You will remember, Mr. Dodds, that I asked current counsel their advice on this matter and I followed such advice, and they told me it was customary in such case where you had a practice, to follow it, and I have done this.

Q So the answer is, was on the basis of your practice?

A It would be absurd to imagine anything else.

Q I appreciate that.

A Anything else would be absolutely absurd.

Q I appreciate that. I just wanted the record to show that, Doctor.

Now, withrespect to other documents than these carbon copies of letters written by you, other

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documents from your files which you identified, again, did you identify them primarily because they had been in your files for years and did you recall that there may have been correspondence on the same general subject or did you identify them from a recollection of the documents or their contents individually?

A Will counsel please rephrase that question?

Q How would you like it rephrased?

A Well, I beg your pardon, restate the question. I wasn't exact in the language.

MR. DODDS: Will you read the question?

(The question was read.)

THE WITNESS: I would like to correct my statement of the last identification. Of course, I identified these things on advice of counsel in the way that I stated, and, of course, in some cases I remembered the sending of the letter very well and that is clear to me and the same remarks apply to all the documents in my file. There are all manners of identification of the documents in my files and any actual identification, and so we will have to go through the documents one by one and I will attempt to state in regard to each one how it was identified at the time it was identified.

Q The record shows, I believe, that in many

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instances you did identify the documents individually by either specific recollection of the document or by association with some other event.

A I don't want a blanket statement by me at this time to change the facts in regard to my identification. I want to have a right to identify it now or in the future at any time by actual memory.

Q Is it correct that the same general rules or guidelines apply with respect to your testimony as to the contents of some of the documents, the subject matter as against just identifying the documents as such?

MR. HALLADAY: The question is objected to as confusing.

BY MR. DODDS:

Q Does the witness understand the question?

A I believe counsel for defense should restate the question in its entirety and not with reference to some previous question.

Q All right.

A And that should be recorded and read back to me and I will attempt to answer it.

Q Dr. Atanasoff, when testifying with respect to the contents of documents written or authored by you or received by you, have you testified from your recollection of the contents of these documents, independent of the documents,

or have you testified as to their contents primarily from an inspection of the documents or in some other way?

MR. HALLADAY: The question is objected to as too general.

BY MR. DODDS:

Q You may answer, Doctor.

MR. HALLADAY: If you can.

BY MR. DODDS:

Q If you can.

A My difficulty -- will the reporter read the question again?

(The question was read.)

THE WITNESS: I suppose there's a little of each in many acts of identification and it is impossible for me to make a general statement about it. Counsel has a right to examine on each individual document.

BY MR. DODDS:

Q Now, there is just one other question that I have that is open, and that was the one some time back about the reference to the portions of Exhibit 455 describing the duty cycle of switch S-3. Now, we can discuss it now or if you prefer, we can put this over until after the conclusion of any redirect examination Mr. Halladay may have or subsequent recross. In other words, until the

conclusion of the questioning.

A If we will take a recess at this time I will sit here and examine the exhibit and attempt to find, if I can locate a reference to that item.

MR. HALLADAY: Why dont we do that?

MR. DODDS: Okay. Fine.

(Recess taken.)

BY MR. DODDS:

Q Perhaps for continuity of the record, I will restate the question. Dr. Atanasoff, with reference to Exhibit 455, the green booklet, the green-covered booklet, will you indicate what portions of that document you believe describes the duty cycle of switch S-3 of figure 1 appearing on page 15 of that document?

A I have searched for such description and do not find it. It is evidently the case of an item that appears in the drawings but not in the specifications.

MR. DODDS: I have no further questions at this time.

REDIRECT EXAMINATION

BY MR. HALLADAY:

Q I have some specific redirect, Dr. Atanasoff, and this may be somewhat disconnected for rather obvious reasons, and I may find myself in the questions going back in time and forth in time, and if I by this confuse you,

why, tell me so and I will try to straighten it out. It's sort of like a patchwork proposition and the painter using the spackle may go from one crack to another crack.

You have referred to a book by a Mr. Richards, and do you recall the title of that book?

A He has written three books and the titles all concern themselves with computing machines and I don't remember the exact title of the book in question.

Q Which of the three books were you referring to?

A I remember that at the time he told me he had written two before, so this must be the third of his books, and I had a copy, but I no longer have it in my possession, having loaned it to a friend and he has absconded with it and I don't have any immediate mode of reference thereto.

Q All right.

A But it is a matter of public knowledge and it's been recognized by the Association of Computing Machine Manufacturers and other things, so I believe the book cannot escape these diligent counsel.

EA#5/1/1/11

Q Then reference was made in the course of the cross-examination to DPX-7, a thesis written by one Robert G. Willson and filed with the Iowa State college authorities in, I think, 1936. Do you have that available, Mr. Dodds, so the witness can have it before him?

MR. DODDS: I do.

BY MR. HALLADAY:

Q Reference was also made in the course of the cross-examination to subsequent theses by a Hart, and I believe a Mr. Kammer. In connection with those latter two theses, reference was also made to publications therefrom that appeared in issues of the Physical Review and copies of which I think were exhibited to you in one way or another in the course of the cross-examination. A question was expressed to you about the apparent fact that in the publication from the Kammer thesis there appeared to be no specific citation of or reference to the earlier Willson work, and you were asked some questions in that frame of reference. Now, I have made this preliminary statement only to have your mind focus on the subject. And as I understood the question, it related to the lack of specific citation to the earlier Willson work in the publication in the Physical Review?

A I believe that's right.

Q Do you have any further statement to make with respect to that matter?

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A Yes.

Q Will you make it, please?

A The answer which I gave to the question that was asked: Why was Willson not given credit in a publication of the Kammer thesis, and I, of course, was the one that should have been able to supply counsel with adequate answers, but you know it was the end of a hard day, and I have had several days of inquiry, and that came to my direction and my mind wasn't working too well, perhaps. The answer I gave at that time was the following: I don't know, perhaps inadvertence. However, the inadvertence is a lame excuse because in regard to such things there is not much inadvertence, and I felt that I should probably re-examine, re-evaluate for you and attempt to correct any false impressions that may have been created by my remark.

I have also thought over the history of these events and I remember that the questioning began with a very stern inquiry from counsel for the defense as to exactly which parts of the apparatus there were built by your hand and which parts were built by Robert G. Willson's hand. I perhaps didn't give quite complete and accurate answer to that and I would like to repeat my remarks at that time and perhaps correct them.

In regard to the last question first. This was a concept which was mine as regards to a piece of

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apparatus for measuring the responses of piezoelectric crystals, the frequencies of vibrations of piezoelectric crystals, if you will; and I remember a remark I made at the time which will surprise you and raise the reason for such an invention is the following; and that is that we found that the spectra of piezoelectric crystals were fully as complex as those of molecular and atomic compounds.

Now, that, this apparatus which I designed for that purpose led to that result.

Now, Mr. Willson built that apparatus, and he did certain theoretical studies in connection with that apparatus which became very clear to me the moment I glanced at the thesis this morning and, of course, I haven't glanced at that thesis since the approximate date thereof. Then I remember more precisely the theses, the theses of Hart and Kammer. And these people had further problems in connection with the elastic constants and the work of those various theses were related as follows:

In the first place, Willson worked out a problem and it's only a question as to whether the problem worked out by Mr. Willson was of special significance in the problem of Mr. Kammer. Now, I could make this further remark and that is that, of course, when you publish things in the Physical Review, why you just got to chop out every item you can, so as far as publishing bibliographies you, in general,

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you cannot do that.

That concludes my remarks on these subjects. I am pointing out that these are the facts which led to the decision as to the credit which is given.

E-5-2

Q Also in the course of the cross-examination, Dr. Atanasoff, reference was made to a discussion, I think at your residence, by some representatives from General Electric Company which had been arranged by Mr. Norman Fulmer and at which certain conversations or discussions occurred, and I am directing your mind now to that event. Would you again state your best recollection of who was present at that time?

A Mr. Eltgroth, Mr. Norman Fulmer and another gentleman from Phoenix, Arizona, oh, I can feel his name right near the edge of my consciousness, but I can't quite get it out.

Q All right, sir.

A He is a member of the patent staff, he is a member of the patent staff of General Electric Company relating to computing machines. I can tell you that much about the man.

Q And did you fix the approximate time of that visit?

A I did, yes. I only could guess because -- but it's a matter of record, I believe, somewheres. It was perhaps in June or July of 1967.

Q Do you have a recollection of any statements made by any of the named persons there whom you can attribute to a particular person?

A I have -- I have one specific statement which is -- which I have been able to remember which I did not make at the time that I was -- that inquiry was made by counsel for defense.

Q Will you give that statement and identify the person who stated it?

A There had been a discussion of the general state of computing machine and the Dawn Henry letter had been examined, but statements have been made by the others as a result of their individual, individual investigations, and Mr. Eltgroth spoke as follows:

"My God, I have never heard any of this. If I had know I could have protected them." I wanted to get that statement in the record.

Q In the course of that statement did Mr. Eltgroth identify the "them"?

A He stated that he had -- he stated either before or after this remark that he had been patent counsel for Mauchly and Eckert at a certain period. And the "them" was, by me, inferred to be these two gentlemen.

Q Also you had said in response to some questions by Mr. Dodds something about having attended or what sounded to me as if you said you had attended joint meetings of representatives of Honeywell and Control Data Corporation. Will you describe any such events that you were referring

to in answering his questions in this regard?

A Well, I will try. I made a casual statement and there have been such events. I remember an occasion in which Mr. Charles Call, Mr. James -- I need a name -- what's your boy's name?

Q Halverson?

A Halverson, Mr. James Halverson and I went to a conference at a laboratory owned by the Control Data Company in which was present also representatives of Control Data.

Q As you go along, would you identify, to the extent you can, the name of or names of the person or persons ?

A Well, there were, the persons connected with Control Data that I should name was Mr. Allen Kirkpatrick and two persons, in particular, two persons from the laboratory of Control Data Company whose name, one of them is called Andy somebody and the other one was Sidney. Well, it might be Sidney Greenfield, but I am not sure. I called Sid. Andy and Sid were the two representatives of the Control Data Company, besides Mr. Kirkpatrick who were there. I believe that there were other such occasions. I am having a little difficulty finding them and perhaps I unduly enlarged upon this association yesterday. I believe that there was an occasion, yes, I am sure there is an occasion when Mr. Kirkpatrick and Mr. Call were both at my house simultaneously.

They were the only two there. And I believe that Mr. Call had come to -- and was spending the day, and Mr. Kirkpatrick visited us for an hour or so during that period, and the date thereof I cannot give you.

I believe that there may have been one or two more such occasions but I don't know.

Q At your house, you mean?

A At my house or otherwise, I don't know. I have a vague -- I haven't attempted to reconstruct this over a period of time, and this isn't any prepared testimony on my part, and I perhaps could do better if I sat down and commenced to reconstruct every item, but I haven't attempted to do this.

Q Did you ever participate in interviewing any potential witness in company with counsel for either Control Data and Honeywell?

A I did. Thank you.

Q Do you remember that?

A Yes. I took a trip -- I took a trip with Mr. Kirkpatrick and Mr. Hall in which we interviewed a number of persons. One of the persons interviewed was a Mr. R. K. Richards. Another one was Mr. Mather. Another one was Mr. James Elder, both of whom gentlemen worked on my machine at one time. And we also interviewed certain other parties at the, at the -- we also interviewed certain other parties at the Iowa State University including Mr. Orr, I remember, Mr. I. A. Coleman. There may have been somebody else

I don't know. Thank you for that.

Q Do you recall any other instances of similar activities involving any lawyers or other representatives of Honeywell and Control Data in which they were in your presence together?

A I do not at this moment.

Q Now, some questions were asked of you by Mr. Dodds concerning the intervention by Iowa State University Research Foundation in a certain lawsuit now pending in the District Court, in the Federal District Court in Baltimore, Maryland?

A Yes.

Q And certain questions were asked ofyou, the general purport of which had to do with your disclosure to or discussion of that fact with any representative of Honeywell?

A There was.

Q Did you -- tell us to whom you made such disclosure, approximately when, and the character of the disclosure?

A As far as the disclosures to the Honeywell Corporation, they were made in Chicago. Present either simultaneously or in the next room were Mr. Dmiti Allegretti, Mr. Henry Halladay, and Mr. Charles Call, and I am not sure all were in the room at one time, I believe they were at one time, but at any rate, they were in adjacent rooms and disclosure was made and there were discussions among

the parties there at that time. And at that time I explained my conception of a right and intention to act thereon. That was the extent of the discussion at that time, and we did not -- I had taken no legal steps at that time, and I, subsequent to that, I did take legal steps. And at the time I took the legal steps, the legal steps which I took, the contract with Iowa State University was not discussed with counsel for Honeywell or with counsel for Control Data. These acts were taken on my part absolutely independently, and as far as intervention goes, this was advice of my counsel -- no, not correct -- the advice of Iowa State University and its counsel, and I was aware of it only briefly before it happened. I did participate, however, in drawing of a contract between Iowa State University and myself.

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Q Did you advise counsel for Honeywell of the fact of intervention before it occurred, that you can recall?

A I advised -- no, I did not. No, I did not. I did not advise counsel for Honeywell of the fact of interference before it occurred. I advised them of an interest to pursue my rights and that was the extent of my disclosure to counsel for Honeywell.

Q And were you advised in that respect by counsel for Honeywell as to what course you should or should not follow?

A I was advised that they would not advise me, which was an act that I considered proper and discreet.

MR. HALLADAY: I am addressing these comments both to the witness and to counsel. On Wednesday, December 4, 1968, by activities of some gremlin it appears that the last ten minutes of reel number 22 and the first 40 minutes of reel 23, or about 50 minutes in time on that morning, we by spot-checking have discovered a very faithful video representation of the witness on our device, but no audio. The transcript of that morning's proceedings had to do, among other things, with the witness' exposition of the process of subtraction in the binary mode, and of division therein, particularly with reference to Plaintiff's Exhibit BB.

An examination of the transcript of his testimony in that respect has left at least certain

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of plaintiff's counsel in doubt as to the understandability of the transcript, particularly without the potential for any reference to his testimony and movements on the video tape.

Therefore, with this apology and with the frank admission that it is repetitious, but in the hope that it will clarify the witness' testimony as recorded, I want to re-examine him briefly on Exhibit BB.

MR. DODDS: That is satisfactory with this exception, that defendants would like the opportunity to review the testimony he gives now with the testimony which he gave before with respect to any possible inconsistencies.

MR. HALLADAY: Surely.

MR. DODDS: A suggestion, which seems like a good one, could not the questions from the transcript be asked and ask the witness in the course of answering those questions to point to the appropriate point, part of the chart?

MR. HALLADAY: A part of the difficulty is that I sat here that morning listening to him and attempting to see whether there was a correlation between what he was saying and what the court reporter was taking down and I didn't do what I had done with respect to other exhibits by way of insisting that he state the

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digits that he was writing as he wrote them or to identify them after he wrote them. So that without reference to the chart, the particular digits to which the witness referred do not flow into the transcript. So that I am saying that even without the problem created by the tape, I would have wanted to do this, and I am perfectly willing to back refer to the transcript, but I am afraid that would get us even more confused.

So I am suggesting that I do it as if it were entirely new and then if it appears there is a discrepancy, inconsistency or if he has changed in any way, that we will obviously participate in having this brought out. I would be glad, however, to read the same questions.

MR. DODDS: I understand this is a new examination covering the same subject.

MR. HALLADAY: Yes.

MR. DODDS: You are not going to use the same questions?

MR. HALLADAY: No, but I said I would be glad in addition to read the same questions but I would like to try to get it in sequence with reference to the chart, Exhibit BB on the board and hope that it is explanatory.

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MR. DODDS: That is acceptable.

BY MR. HALLADAY:

Q Now, Dr. Atanasoff, as I have been talking, I assume you have been listening. Whether what I have been saying is capable of being followed, I don't know.

A I believe it is. I am not sure I can satisfy you, but I will do my best, sir.

part 2

Q All right, sir. I would like to direct your attention to Atanasoff Deposition Exhibit BB which Mr. Allegretti has put back up on our easel here and which is titled at the top "Subtraction with Exhibits Y and Y-1." My first approach to this is for the present, at least to eliminate reference to Y and Y-1 in the course of your testimony, just in the hope that we can get an explanation that will be meaningful in the typewritten transcript about what is shown on Exhibit BB.

Are you with me?

A Yes. I may, however, state that I believe that -- Did you say Exhibits Y and Y-1?

Q Yes. That is the test set.

A I understand. As a matter of fact, the test set was not used in this demonstration and no remark was made relative to the test set in this demonstration, if my memory is correct, so I don't believe you are eliminating anything.

Q Well, I think at one time or another you did.

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6/5/19

A Up above.

Q I am talking about both parts of Exhibit BB.

A The upper part was done with the test set, however.

Q All right. At this point, I am not going to put the test set back before you because it tends to lend an element, at least in my mind of confusion in respect to the purposes I am now trying to accomplish.

A All right.

Q On Exhibit BB at the top is written "Subtraction With Exhibits Y and Y-1," and I am now going to ask you to describe the subtraction as reflected by Exhibit BB without referring to or using the test set, Exhibit Y and Y-1, and what I am asking you to do, in effect, is to say what is there, describe the digits and describe the processes that were performed in producing those digits, first with respect to those which are in the binary mode, as I have called it, and those which are on the decimal basis, and that limits your attention with respect to this question to the top part of Exhibit BB which is above the wavy line drawn across it. And again, I suggest that as you do this, you think in terms of drafting a paper describing this activity, which paper includes a chart but which you hope will not necessarily require reference to the chart to understand the text of what you are saying.

Now, have I presented you with an impossible undertaking?

6/6/20

A No, not at all.

Q All right.

A I will attempt to state as I go over this problem of subtraction -- as I go over this problem of subtraction, I will attempt to state what I would do if I were using the test set and what result the test set would give, but I will not use the test set to save the complication of its use.

This is a problem in subtraction. We had two four-digit numbers, one one zero one and one zero one one, and I am to subtract the latter from the former. We start -- I might say one one zero one is represented by the base ten number thirteen and one zero one one is represented by the base ten number eleven, and the subtraction gives the result two, but we are going to be a little tedious and examine this in the base two system.

Now, to do this with a test set, and the reason for this is to realize quite concisely exactly what the computing machine does in making this calculation, We point out that originally CA, the CA drum contains the one one zero one and the KA drum contains the one zero one one number and that the CA number gains access to the module under test through the terminal B given in figure one here, which I can set right here and you can refer to.

Q Figure one of Exhibit W?

A Of Exhibit W. Figure one also called it Exhibit W.

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CA gains access to the test set through terminal B and K obtains access to this through the terminal D.

Now, these terminals are also marked on the test set with the same letters so that when you press those letters on the test set you will get the same results as if a one was coming in from the respective CA or KA. So this will illustrate the operation of the machine, but it will simultaneously illustrate the operation of the test set.

Now, at this point we press on the test set a B and we press D and the test set gives us zero on one light which is called -- I would like to see that test set for one second just to tell you what letter is there, which is called K and which corresponds to output terminal A which leads back into CA, you notice. A is zero, but also C is zero, so A goes here and C goes up there.

Q Again I interrupt because when you say "A goes here and C goes there" --

A A goes at the foot of the first column -- I am sorry of the right-hand column. May I change this, or don't you want it changed?

Q I would rather you didn't change it.

A Well, I wanted to add something. Now, I could add just verbally that this result is a new result which will appear in CA.

Q When you say "this" --

6/8/22

A The results below the line of subtraction which is here written as zero zero one zero, is a result which will appear in CA after the operation of CA is added to KA, but this is a new CA that appears here below the subtraction line.

Q I assume that what you were thinking of writing was a CA prime or CA star to identify --

A It was.

Q -- the results of the addition.

A You define my purpose exactly.

Q All right.

A Now, -- so as a result of the operation of the test set, there will appear in the right-hand column of figures a zero underneath the line and up at the carry position there will appear a zero. Then we press -- then we have three digits in the second column to face. There is a zero at the top in E. There is in B, to go into B a zero and to go into D there is a one. You push only the D because the others are zeroes, and there appears in the light marked A a one, but in the light -- we are subtracting, remember, so you also, when you are subtracting one from zero, of course, you get a one left, but you also get a one carried. Of course, it is a minus one that is carried, also. That is a minus one carried up there at the top, so in the carry position which is marked E, we get a one. This will be in the third column now because it's carried from the second column into the

6/9/23

third column.

We now examine the third column. You have in B a one. You have in D a zero. You have in E a one, and when you subtract you get a zero in the, below the line in the third column and you get a zero in the carry position in the fourth column.

Now, we have in the fourth column a zero in E, a one in B and a one in D.

Perhaps this is a good point to be a little more specific. You notice the one in B is positive. The one in D is negative and the one in E, if there had been one there, would be negative because you don't carry a negative number.

Q Well, all right. You subtract the one from the one and you get a zero, and so there appears at the foot of the fourth column a zero and the final results of the subtraction is the binary number one zero, and one zero is equal to two and this is verified as the two of the other subtraction.

Q Then directing your attention to the portion of Atanasoff Deposition Exhibit BB below the wavy line, what does that illustrate, if anything?

A That illustrates division according to a modified process which is contemplated in the booklet and which was being designed into the ABC. It is of particular interest, too, because it is described in the booklet in the position

6/10/24

where I pointed out that there is an interference where claim one hundred of a certain patent reads upon the booklet, and this process is the one as far as, according to my best knowledge andbelief, is carried in claim 100, and it was explained here by me, and I am not even sure that counsel for plaintiff knew why this, the details were given here but it was explained by me in detail because it illustrates that process. If counsel will permit, I will make a short estimate of the advantages of this process.

Q First, I would rather that you would state it in words, as briefly as you can, what process is illustrated by the numbers which you have written on the lower portion of Atanasoff Deposition Exhibit BB.

MR. DODDS: I want to make a statement on the record here that the witness' reference to the claim 100 of the ENIAC patent and its relation to what he is about to describe or has described is a departure from his earlier testimony with reference to Exhibit BB.

E-7-1

THE WITNESS: It is such a departure. Let the witness record that it is such a departure, and it's given here for fullness and for exactness. I don't know how to be exactly responsive, Mr. Halladay. Will you restate your question once more, please, and I will try to listen carefully and be responsive to it.

BY MR. HALLADAY:

Q All right. I will try. I am attempting to shorten this as much as I possibly can, and it may notbe possible. I had hoped that I could ask you this question. Can you describe what is illustrated by the figuring that you did on the lower half of the Exhibit BB in words?

A I can.

Q Would you do so?

A I will sit down for this process to avoid the tendency to point to the board. Below the wavy line on Exhibit, Atanasoff Exhibit --

MR. DODDS: BB.

THE WITNESS: -- BB. I am not quite that blind, but -- there is illustrated a process of division which, which was planned for the Atanasoff-Berry computer, which is described not exactly as division but as an elimination process equivalent to division in Exhibit 455 and which has the following properties:

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It is normal for computing machines to divide as follows: The divisor is subtracted from the -- I will begin again.

The divisor is shifted into a suitable position and is subtracted from the dividend successively until the results carries to the left through the counters as an excess amount of subtraction. In normal computing machines, it is usual at this point to add the divisor into the difference previously obtained which causes the carry through to clear. A shift is then made to the next position and subtraction begins again. It will be noted that there are two additional steps in this process. The divisor has to be subtracted one more time so that the results will carry through, but then it has to be re-added which is a totally new and unneeded step as conceived by the process which we will later describe.

The difference in mechanical cost of this process is not great as applied to the base ten numbers. I can make a calculation, you see, you might say you need to subtract roughly five times, a rough calculation, you need to subtract in an average position perhaps five times. You subtract until carry through is obtained. Let's just say not five times, let's say N times until carry through is obtained. Then you add one so you have an

amount of labor in this position and an N plus one appearing instead of an N. But N in the base ten system will be comparatively large, maybe two or three or five so that addition of one to it does not amount to much, but in the case of base ten numbers --

BY MR. HALLADAY:

Q Base ten?

A Pardon me, I am sorry. Correction, in the case of base two numbers, carry through obtains in either the first or the second subtraction. So an appreciable fraction of the work of division is added by the subsequent step to restore the number. The process to be described obviates this additional step. The new process proceeds as follows:

After the divisor is subtracted from the dividend, the divisor being suitably situate below the dividend, by a shifting process, until carry through is obtained, the shift to the next position is immediate, but in the next position subtraction does not occur but addition instead. Addition is, takes place in this new shifted position until carry through is removed whereupon another shift occurs and the process is repeated.

By proper interpretation a count of the number of subtractions and additions permits the quotient to be obtained.

That is a description in words of what was done there.

Q On Exhibit BB, on the portion appearing below the wavy line, you have written on the left-hand side thereof the legend, "First, second, third, fourth," beneath which you have put in certain signs or symbols. Will you state what those are?

A Well, that means that on the first subtraction we subtracted twice before carry through was obtained. In the second we had to add twice. Now, we had bad luck here. You have to either add -- we have to subtract either once or twice, but we had to subtract twice there. Again on addition you either have to add once or twice, but we had to add twice before carry through obtained -- I mean before carry through was removed. In the third position we had to subtract twice again before carry through was obtained, and the fourth position we had to add twice before carry through was removed.

We have noted previously that the exact dividend and divisor have created a continuing decimal in the base two number system. This is easily verified because we easily verify one number is 27 and the other is 20, when you divide them the result is one point thirty-five, but one point thirty-five when expressed -- one point thirty-five is in the base ten number system but when

the quotient one point thirty-five is expressed in the binary system, why it results in a continuing decimal. I can give you a demonstration of that if you wish.

Q No, thank you.

MR. HALLADAY: I have no further questions.

RECROSS-EXAMINATION

BY MR. DODDS:

Q Just a few questions. You stated a few moments ago, I believe, that you had glanced at the Willson thesis Exhibit DPX-7 this morning. Was that done in the course of your identification here during your examination?

A The only time I have seen this thesis in the last thirty years has been in the course of the, of my deposition. Thirty years? Well, approximately thirty years, just say that. Maybe I looked at it some time during, between, before 1942 again, but let's say since '42, that would be 26 years, except in the course of the deposition here.

Q Do I understand you correctly then that the only copy of the Willson thesis which you have seen in recent years is this physical copy I put before you?

A It is, sir.

Q Do you recall approximately how much time you spent in glancing through this Willson thesis to identify it?

A I would say perhaps ten or fifteen seconds.

Q You referred to two persons whom you identified by the name of Andy and Sid, I believe who were connected with Control Data Corporation. Were they engineers or what was their --

A Andy is a technician and Andy's last name I cannot remember, but I believe Sid, now it comes to me a little better, I believe Sid's last name is Greenwald, if you care to put it down, Greenwald. I probably said something else.

Q What is his capacity?

A He is an engineer with the Control Data Corporation.

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Q Dr. Atanasoff, since the adjournment of this deposition yesterday afternoon and before its resumption this morning, have you discussed the substance of your previous testimony with your own counsel Mr. Fallon?

A Oh, for -- he was -- he was putting the call through immediately last evening and maybe he and I were together for 20 minutes, but the subject -- he said -- well, I could tell you what he said to me. I -- suppose I quote what he said and then it will give you an idea as to how extensive his remarks were.

Q I think that is probably privileged information.

A It is privileged. It is privileged. Exactly what is it you seek? I would consider it privileged and perhaps I shouldn't give up that privilege.

Q No. The question was, I didn't --

A I have discussed it.

Q Not the substance of what your discussion was, but have you discussed the subject matter of your previous testimony with your own counsel, and again I am not asking the substance of the discussions, was there a discussion of the substance of your previous testimony?

A The additional testimony that I gave on my testimony yesterday except as that has been elicited from me by this gentleman is at my own instance, and I myself ask that the question in regard to this thesis be reopened because I felt

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I made kind of a sloppy statement yesterday.

Now, he didn't advise me to reopen anything, may I say that. Is this exposing privilege communication? I guess it is, but that is the truth.

Q I gather --

A I make this without promise to disclose any further communication between the parties.

Q I gather the answer to my question is yes, that you did discuss with your own counsel the substance of your previous testimony?

A Yes. He said -- well, damn it.

Q The second question, since the adjournment of this deposition yesterday afternoon and its resumption this morning, did you discuss the substance of your previous testimony with counsel for plaintiff?

A Yes, I did.

MR. DODDS: I have no further questions at this time. Excuse me one minute. No further questions at this time.

REDIRECT EXAMINATION

BY MR. HALLADAY:

Q Describe the nature of your discussion with me about your testimony to be given today?

A I said, "Please, Mr. Halladay, reopen the subject

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of the thesis." Let's see if I can get any other point that was discussed with you. You said, You told me about the -- you told me about the lack of good reproduction of the material that is in Exhibit BB and stated that you wished me to repeat it.

Q Anything more?

A You also said you would like to reopen the subject of exactly how much time I had witnessed people from Honeywell and people from Control Data spending together, and I had -- I had refreshed my mind on this overnight at my own instance and was able to give slightly more succinct testimony.

In addition, I had mentioned to you, not since the conclusion of the day yesterday, but previously, that I wished you to reopen the subject of the visit of the General Electric people so I could give -- so I could place an additional item therein which I did.

MR. HALLADAY: I have nothing further.

MR. DODDS: Just one -- nothing further. Thank you.

THE WITNESS: Thank you.

MR. HALLADAY: For the record, my understanding is that you desire to read, have an opportunity to suggest corrections and to sign your deposition, you do not wish to waive those rights?

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THE WITNESS: That is correct.

MR. HALLADAY: With that understanding the deposition is adjourned sine die.

MR. DODDS: Can we have an understanding with respect to corrections to the record? I am speaking now more in the nature of formal corrections rather than any corrections the witness wishes to make. We had a little problem in connection with the deposition of Dr. Dietrich some time ago in which procedures were adopted which, apparently, were not satisfactory to one or both parties. What is your usual practice in obtaining formal corrections to the transcript?

MR. ALLEGRETTI: I can state a practice of my own which is one, perhaps, not your own, and was at the root of our difficulty with the Dietrich deposition. That is, I do not send to the witness a transcript marked in any way with my suggestions for changes, be they typographical or any other. I ask the witness to read the transcript and give me his changes, if any. If I have others or additional ones I discuss them only with opposing counsel.

MR. HALLADAY: In my case, I have no intention of discussing with Dr. Atanasoff the transcript

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in any way before he has read it and made corrections that he thinks appropriate entirely on his own initiative, and my own practice has been if I find as a result that that technique that the witness suggested corrections with which I do not agree, then I make a record of that. If I find additional corrections that I think are suitable then I make a record of that without communicating with the witness with respect to that.

In no event have I ever suggested corrections in a question made by me or by other counsel without consulting with other counsel as to what his recollection and notes show as to the question and then by conferring jointly with the court reporter to determine whether or not the reporter's stenotype or stenographic or shorthand recordation conforms with one or the other or neither.

MR. DODDS: What do you do with this record you have made of the deletions or additions to the transcript after it has been reviewed by the witness?

MR. HALLADAY: If the parties cannot agree with the witness nor the witness cannot agree with the parties then the only resolution I am aware of is to be accomplished by the court reporter and the Court.

MR. DODDS: I am willing to abide

by that. I would like to put on the record though there seems to be an inference the procedure which was followed in the Dietrich deposition was improper. I will say that I have done that in a number of instances merely to ease the load on the witness in going through and making typographical corrections because sometimes in, that record, particularly, was not good, and it was only done to ease the burden, but if that is your practice, I am perfectly willing to follow it in this case.

MR. HALLADAY: Thank you.

MR. DODDS: And as I say, I don't know whether this is on the record or not, but I would like to compliment the reporters, I think they did an exceptionally good job of reporting.

MR. HALLADAY: Me too.

THE REPORTERS: Thank you.

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THE WITNESS: I have one further point.

MR. HALLADAY: Yes, sir.

THE WITNESS: I ask counsel, is it within my province to waive my relation with counsel and disclose the information disclosed in the discussion between myself and counsel as of last evening after this meeting closed?

MR. HALLADAY: Well, I would agree that that disclosure would not constitute an opening of the door to the disclosure of any other confidential communication.

THE WITNESS: That's the only point I am asking.

MR. HALLADAY: Before you say anything, we should hear from Mr. Dodds.

MR. DODDS: I would prefer not to hear any --

THE WITNESS: Well, I would prefer that you do hear it, Mr. Dodds.

MR. DODDS: Well, I would not want to hear it without Mr. Fallon being present or without his consent.

THE WITNESS: I will, if allowed by counsel, I will make a statement in regard to that.

MR. DODDS: Well, I object to its being included on the record.

MR. HALLADAY: Well, I think under those circumstances, Dr. Atanasoff, that Mr. Dodds is saying you should not say anything without having had your own lawyer's advice as to the propriety of so saying. In other words, you have the right to waive the privilege.

THE WITNESS: I will so waive.

MR. HALLADAY: But my point is, that he is suggesting to you that you should not waive the privilege without advice from your lawyer as to the potential consequences of having done so.

THE WITNESS: I will accept the estimate made by counsel for the plaintiff in regard to the consequences thereof.

MR. HALLADAY: No, but my point is, that I said I would make no contention that a waiver as to last evening's conversation would constitute a waiver as to any other confidential communication between you and Mr. Fallon. I asked Mr. Dodds, would he agree with you to that effect, and I have heard no answer from him.

MR. DODDS: I would agree to that as far as that goes, but I object to hearing any

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THE WITNESS: The witness will proceed to make his statement.

MR. DODDS: I object to including on the record the witness volunteering subject matter. There is no question before the witness.

MR. HALLADAY: Well, the witness, I think, has some prerogative as to what is on and what is off the record in this respect.

MR.DODDS: I say, there is no question before the witness and the witness is here to answer questions.

MR. HALLADAY: Do you have some statement which you would insist being on the record?

MR. DODDS: I understand the deposition has been closed.

MR. HALLADAY: Well, it has been closed in this respect. The witness has stated that he has a statement he desires to make, and I now ask him, do you or do you not have a statement you desire to make?

THE WITNESS: I do have a statement to make.

MR. DODDS: I object to the receipt of the statement. The deposition has been closed and the witness has no right to make a voluntary statement after

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the closing of the deposition. I object to its inclusion in the record, and if it is put on the record I reserve the right to move to strike; and furthermore, under these circumstances, I withdraw our agreement to a waiver of privilege with respect to any communications between the witness and his counsel.

MR. HALLADAY: Well, I understand now, Dr. Atanasoff, that Mr. Dodds -- he should speak for himself --but if I understood what he just said, he now will take the position that if you say anything about a communication with Mr. Fallon as of yesterday, he is at liberty to inquire of you as to any other communications between you.

THE WITNESS: That is exactly the point. I will not speak under these conditions. I will, however, state that I would like very much to place this on the record if immunity, if other communications between counsel and myself were left inviolate, if there were an agreement that other communications between Mr. Fallon and myself were left inviolate, period.

MR. HALLADAY: I would so agree.

MR. DODDS: I guess that's it.

MR. HALLADAY: That's it.

(Whereupon the deposition came to a close

Subscribed and sworn to before me this _____ day of _____, 19__

_____
John V. Atanasoff

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

We, Earl G. Anderson and Ward L. Sutfin, notaries public in and for the County of Hennepin and State of Minnesota, do hereby certify that the deposition of Dr. John V. Atanasoff was taken on behalf of the plaintiff in a certain cause now pending and undetermined in the United States District Court, District of Minnesota, Fourth Division, before me at 2515 First National Bank Building, Minneapolis, Minnesota, on December 3, 4, 5 and 6, 1968.

That said witness was duly sworn by us; that said deposition was taken down in stenotypy and afterwards transcribed into typewriting under our supervision; and that the foregoing is a true and complete transcript of said testimony.

We further certify that we are not related to any of the parties or counsel before named, and that we are not interested in this matter directly or indirectly.

IN WITNESS WHEREOF we have hereunto set our hands and seals this 6th day of December, 1968.

Earl G. Anderson

Earl G. Anderson, Notary Public,
Hennepin County, Minnesota
My commission expires Apr. 6, 1973

Ward L. Sutfin

Ward L. Sutfin, Notary Public
Hennepin County, Minnesota
My commission expires Nov. 6, 1975.