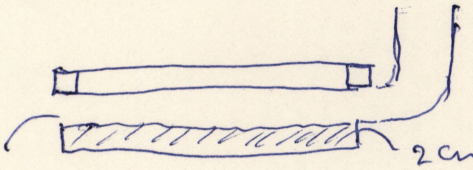
Solar Evaporata

1981 July 19

Solar constant ⇒ 1 langley → 1 cal/cm² min



Heat of vaporization 585 cal/g.

So to evaporate all of juice with no loss will require $\frac{2 \cdot 585}{1} = 1172$ min ⇒ 19.5 hrs ⇒ 20 hrs

All of juice will not require evaporation – say $\frac{2}{3}$

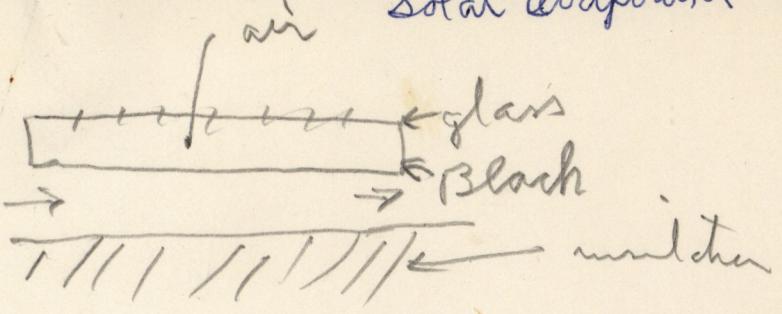
But there will be inefficiencies ($\frac{2}{3}$ eff.) → 5 hrs

Now double glass area and half depth.

$30'' \times 30'' \times \frac{1}{2}'' = 450\ in^3 \Rightarrow$ 2 gals; Cut to $\frac{1}{4}$ → $\frac{1}{2}$ gal

[$\pi r^2 = 2\pi r h$] [$h = \frac{r}{2}$, if $r = 1''$ $D = 4''$?]

Solar Evaporator 1981 July 1-12



$8\frac{1}{2} \times 8\frac{3}{4}$

$\times 3$

200.

$\frac{487}{12} = .2818$

62,5

.001 $\frac{kcal}{mm\ cm^2} \rightarrow \frac{cal}{cm\ cm^3}$ ~~$1\ ft^2 \times \frac{1}{2}$~~

~~$\frac{kcal}{m\ ft^2}$~~

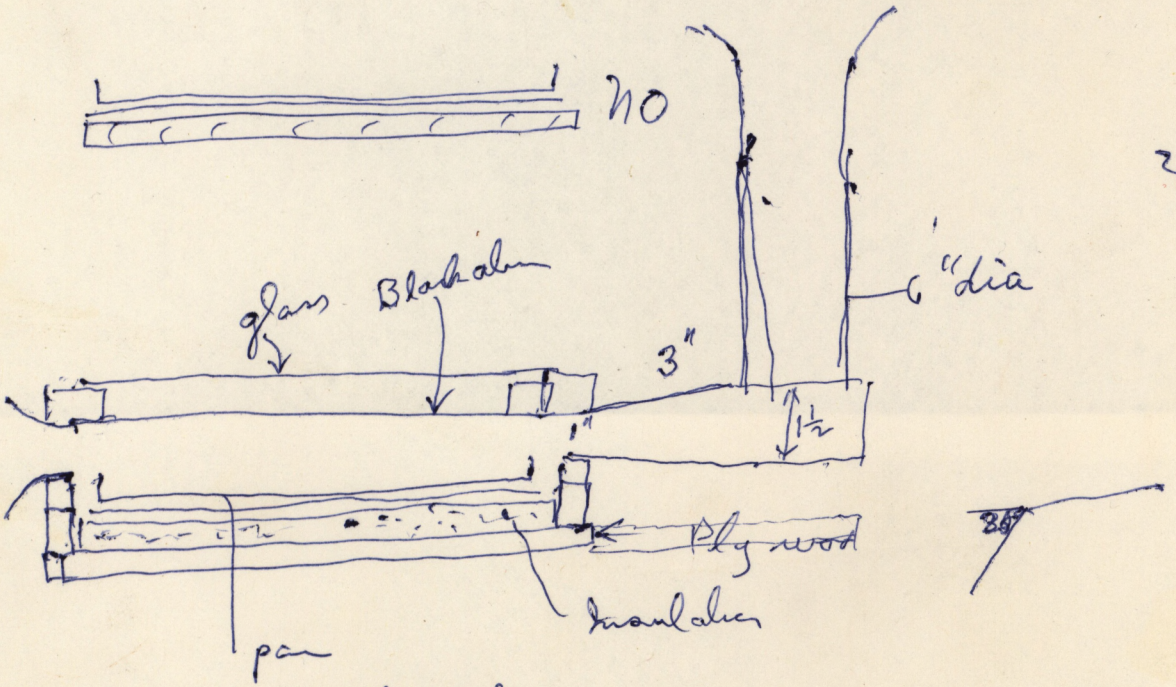
$1\ cm^3\ al \rightarrow 2.7\ g \rightarrow .594\ \frac{cal}{cm^3}$

$7.9 \times .115 \rightarrow .90$

$\frac{3}{8}$

$\pi r^2 = 2\pi r h$

$h = \frac{r}{2}$



$\frac{2101}{58}$