

SZILARD

II

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Chicago 37 Ill

1033 E 67

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Nov 18/48 (~~Friday~~ Thursday)

## Resumé of Proband Experiments

T<sub>2</sub> x T<sub>4</sub> cross was grown in B<sub>1/2</sub> and plated on B<sub>1/4</sub> (on Oct 12)  
1 Plaque was grown in B<sub>1/4</sub> (Nov 1) and gave  
~~from clear plaques on B<sub>1/2</sub> + B<sub>1/4</sub> (10% clear)~~  
~~typical~~ plated on B<sub>1/2</sub> two plaques  
a and b picked. —

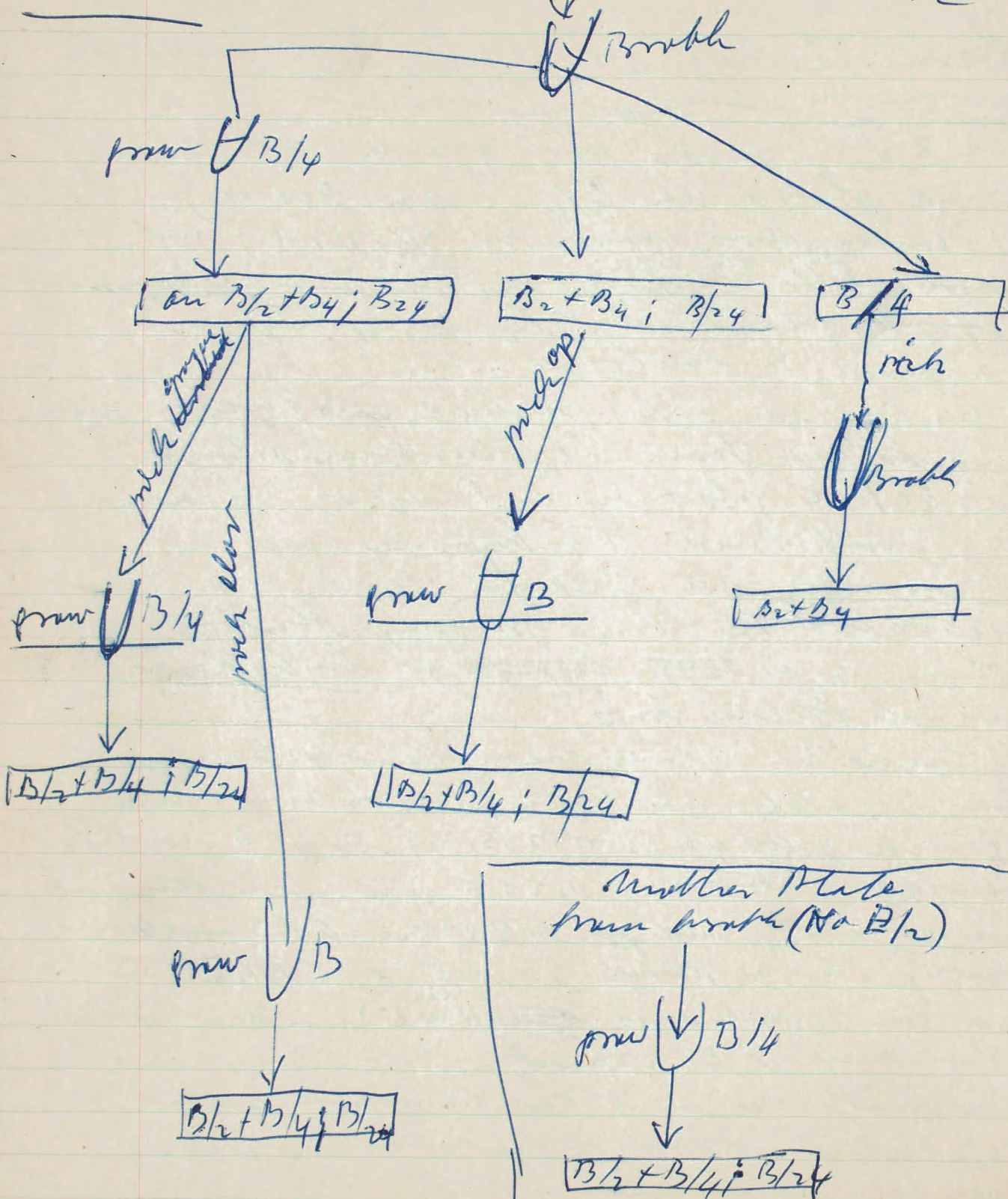
On Oct 20 we picked plaques  
29 to 30 from B<sub>1/4</sub> another plate  
of Oct 12 plating. Plaques 22 and  
30 contained T<sub>4</sub> type

Platings on Oct 22/48  
shown on B<sub>1/2</sub> + B<sub>1/4</sub> plating that  
plaque a is ~~not~~ ~~not~~ hybrid  
which breeds true

Plaque 30 gives no clear plaques  
on B<sub>1/2</sub> + B<sub>1/4</sub> is therefore a non-breed  
Nonch grow up Nov 2, 3, 4, 5 and 6 in B<sub>1/4</sub>  
~~non~~ (growth tubes). 1, 2, 5, 6 gave clear plaques  
on B<sub>1/2</sub> + B<sub>1/4</sub> and ~~not~~ on (C) B<sub>1/2</sub> but 3 and 4 did  
not. Later he plated 1, 2, 4, 5 on C B<sub>1/2</sub> and  
four gave 10 weeks ones ~~see~~ (Nov 5). — Nov 2nd picked  
a clear plaque of No 2 growth on B + C B<sub>1/2</sub> and  
grew (growth tube) in B and henceforth called  
No 2 Proband. & which if plated on B + B<sub>1/2</sub> gives  
clear plaques only. —

Sketch

Mother Male Nov 11  
Milk after growth  
in B/2



Rowley

*Antiserum exp on Nov 9<sup>th</sup>*

14

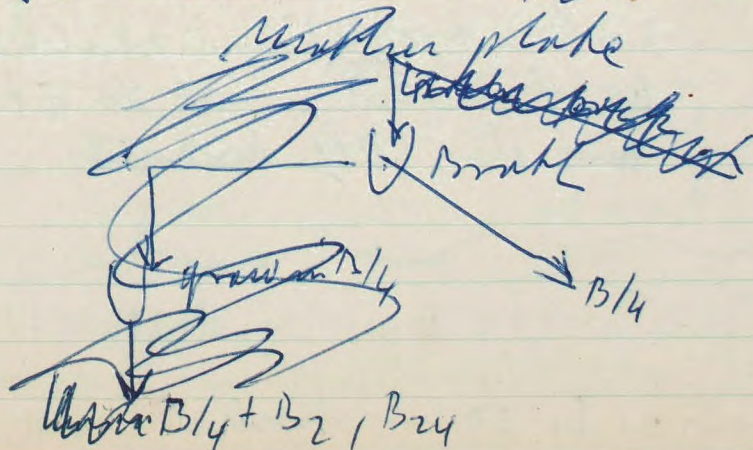
Summary: 9 out of 19 plaques ~~grown~~  
(about 1/2) gave lookards of grown in B<sub>1</sub>/4  
further. Urgent: do any ~~the~~ plaques  
ever breed true?

1.) Of 20 plaques picked from "after" plate on B<sub>1</sub>/4  
none gave plaque on B<sub>1</sub>/24; 5 gave few  
clear plaques on B<sub>1</sub>/2 + B<sub>1</sub>/4. -

2.) Of those same 20 plaques grown in B<sub>1</sub>/4  
12 were grown in test tubes, ~~12~~ show  
lookards in appreciable number on mix  
and 11 show them on B<sub>1</sub>/24 (3); of 8 grown in  
B<sub>1</sub>/24 growth tubes 6 show lookards on mix  
and 4 show lookards on B<sub>1</sub>/24

4.) of T<sub>1</sub> x T<sub>2</sub> cross [of T<sub>2</sub> Nov 16<sup>th</sup>] [all those above  
came from cross Nov 11] from both plated  
on B<sub>1</sub>/4 20 plaques were picked ~~from there~~  
and grown in B<sub>1</sub>/4 <sup>test tubes</sup> [51 to 70] of these 15  
plated on ~~mix and 12~~ B<sub>1</sub>/2 + B<sub>1</sub>/4 and B<sub>1</sub>/24  
8 show lookards on mix and 6 show them  
on B<sub>1</sub>/24. - i.e. about 1/2 show lookards.

Sketch:



B/24(3)

B/2 + B/4

51	~50	<del>50 clear</del>	~ 200 up
52	~150	150 clear	~ 400 up
53	~100	100	~ 1000 up
54	1	8 clear	~ 500 up
55	50	100 clear	~ 300 up
56	5	4 clear	~ 400 up
57	0	0	~ 300 up
58	0	9 clear	~ 200 up
59	0	0	~ 500 up
60	0	1 clear	~ 300 up
61	0	0 clear	~ 400 up
62	0	0	~ 400 up
63	0	3 clear	~ 500 up
64	0	0	~ 200 up
65	0	0	~ 200 up
66			
67			
68			
69			
70			

This <sup>sample</sup> in B/24(3) 6 out of 15 are T<sub>2</sub> - 1 nest  
 are independent T<sub>2</sub>'s & but are there really so many  
 independent T<sub>2</sub>'s? Or these same that do not grow on  
 B/2 | plate on B/4 and also field for birds

Exp Chart. [ From T<sub>2</sub> x T<sub>4</sub> cross made on Nov 11 the  
 after growth in B/2 a mother plate on B/4 was made  
 from white plumes 31 to 50 were picked & and plotted

H

Friday Nov 19/48

Brushed off back assays (~~was~~  
~~whether~~ whether it breeds pure) plated on B/2 + B/4

34 both clear and opaque ~ 35 cl ~ 70 sp.

35 1 x 310<sup>7</sup>

37 all clear ~ 3000 x 10<sup>7</sup>

38 15 clear (no op) x 310<sup>7</sup>

39 ~~both clear and opaque~~ <sup>(no op)</sup> ~ 1000 x 10<sup>7</sup>  
~~35 clear ~ 70 sp~~

40 clear (no op) 36 x 10<sup>7</sup>

2 all clear x 10<sup>7</sup>

42 1/2 clear (no op) ~ 100 x 10<sup>7</sup>

44 1 clear (no op) x 10<sup>7</sup>

From experiment made on Tuesday 16 Nov  
 12 x 14 cross plated from broth (no  
 B/2) on B/4 ("assay") twenty plaques (51-70)  
 picked and grown in test tubes in B/4  
 plated on B24(3) and B/2 + B/4

→ on B24(3) and B/2 + B/4. These plates are  
 numbered in red 31-50. The opaque plaques  
 (mostly all opaque anyway) ~~should~~ on the  
 inside ~~plate~~ plate should be red pure.

T<sub>4</sub>. We picked 20 plaques ~~(71-90)~~ and  
 grew them up in B. 15 of these ~~(31-50)~~ picked today  
 on plates 71 (31) to 85 (45). —

How does this check with experience that  
 we get rise of  $\times 25$  in  $T_2$  after "plate on B/4  
 unless  $T_4$  later rises by 150?

before  $T_2 + T_2^*$ ; after is  $88 \times 150 \frac{T_2^*}{2}$

ratio should be  $\frac{\text{after}}{\text{before}} = \frac{150}{4} = 32$

Proposed exp: does during growth in  
 test tube in B/4 which leads to "manifest"  
 loss of a gene ( $T_2$  gene) get "lost" or  
 does the  $T_4$  gene present in the host induce  
 a mutation to  $T_2$ ? Cross host with  $T_2$ !

	on B/24 + B/2	on B/24 + B/4
71	0	~ 100 spores
72	0	~ 200 spores
73		~ 25 "
74	0	~ 50 "
75		~ 100 "
76	0	~ 150 spores
77	0	~ 200 spores
78	0	~ 50 spores
79	0	~ 30 "
80	0	~ 30 "
81	0	~ 30 "
82	!!! stop? $T_1$ & $T_2$	~ 400 "
83	spore	
84	spore	
85	spore	



Proposed Exp

How many infect  $T_2$ -s are there?

Mix  $T_2 \times T_4$  cross, infect  $B/2$  (5 min ads.) add anti  $T_2$  (5 min) and plate infective centers on  $B/4$  (repeat with 10 min ads on  $B/2$ )

Also determine  $T_2$ -s by plating on  $B/4$  (from broth) ~~Does this~~ Will this then check with result of 51 to 65 plaques?

Interpretation of Exp conducted on Nov 10/48

In that exp. we did the following [Plaques marked Inf. centers]: We crossed  $T_2 \times T_4$  added  $T_4$  in excess to  $B/2$  added lysate +  $T_4$  to  $B/2$  (5 min) added anti  $T_2$  (to knock down  $T_4$  by phage?) and plated on  $B/4$

and  $B/2 + B/4$  before lys. - New Orthomyx and before plate on  $B/4$  give 90 plaques = titer  $9.0 \times 10^8$   $T_2$ ; plating of inf. centers on  $B/4$  gives 122 plaques giving titer of  $[T_2 + T_2^* \text{ ads}] = 2.44 \times 10^8$  and on  $B/2 + B/4$  gives 161 plaques giving  $[T_2 + T_2^* \text{ ads}] = 3.22 \times 10^8$  (difference could be a solenoid effect because  $B/2$  was infected with  $T_4$  also)

Taking  $\{B/2 + B/4\}$  value we get  $\frac{T_2^* \text{ ads}}{T_2 + T_2^* \text{ ads}} \approx \frac{1}{3}$

~~$T_2 \times B/2$~~  or  $T_2^* \text{ ads} = \frac{1}{2} T_2^*$

Assuming that  $T_2^* \text{ ads} = \frac{1}{2} T_2^*$  we have  $T_2^* = T_2$

Dec 4/48

Plate counts for Chuvoshat

Plates from Dec 3rd  $10^{30}$  AM  $\times 10^5$

$$\begin{array}{r} 349 \\ 361 \\ 357 \\ \hline 1065 \end{array} \left. \vphantom{\begin{array}{r} 349 \\ 361 \\ 357 \end{array}} \right\} 355 \times 10^5$$

Dec 5/48

Plates from Dec. 4

$$\begin{array}{r} 11 \text{ a.m.} \\ \left. \begin{array}{r} 532 \\ 517 \\ 575 \\ \hline 1624 \end{array} \right\} \times 10^5 \\ \hline 3 = 541 \end{array}$$

$$\begin{array}{r} 3 \text{ pm} \\ \left. \begin{array}{r} 528 \\ 502 \\ 499 \\ \hline 1529 \end{array} \right\} \times 10^5 \\ \hline 3 = 510 \end{array}$$

$$\begin{array}{r} 344 \\ \text{pm} \\ (1\frac{1}{2} \text{ h mm}) \\ \left. \begin{array}{r} 158 \\ 177 \\ 165 \\ \hline 500 \end{array} \right\} \times 10^5 \\ \hline 3 = 166 \end{array}$$

11

Proposed exp. make plating  
from plaque made from  $B/4$  mother  
plate (after) on  $B/24 + B/4$  and  $B/24 + B/2$   
but have only few plaques on  
plate so that  $T_4$  contamination can  
be neglected. — To see if specimen capable  
of growing in  $B/2$  is thrown at an  $B/4$  plate

Proposed exp to see if independent borders  
all lead to independent  $T_2-5$

- 1.) Pick independent border and put  
it into  $B$ , abundantly infected  
with  $T_4$ ; plate ~~in  $B$~~  before lysing on  
 $B/4$  and  $B/4 + B/2$  cells and after  
lysis plate again ~~the~~ note rise
- 2.) Make usual  $T_2 \times T_4$  cross, see if  
second rise in  $B/2$  occurs and check  
see in another experiment if there is a  
second rise in  $B/2$  provided that the  
first rise in  $B/2$  occurs in a  $B/2$  which  
also has absorbed  $T_4$ . —

Chernoshat (I) num of bee P and G  
bee P at 4:30 pm 433  $\times 10^4$

T<sub>7</sub> test O.K.

T<sub>1</sub> test O.K.

Dec 8 10 pm 459  $\times 10^4$

T<sub>7</sub> test O.K.

T<sub>1</sub> test O.K.

T<sub>1</sub> alone O.K.

T<sub>7</sub> alone O.K.

next day (more Pyosphosphate):

bee 9 10 AM  $\left\{ \begin{array}{l} 786 \\ 817 \end{array} \right. \times 10^4$  \*

$$\frac{1603}{2} = 801 \times 10^4$$

bee 9 10:30 AM  
bottle empty O.K.

T<sub>7</sub> test O.K.

→ bee 9 10 AM  $\left\{ \begin{array}{l} 270 \\ 271 \end{array} \right. \times 3 \times 10^4 = 810$

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$$CF = 3 \times 10^{-15}$$

414 pm  
(1 hr run)

$$\left\{ \begin{array}{r} 322 \\ 383 \\ 355 \\ \hline 1060 \\ 3 \end{array} \right. = 353$$

$\times 2.5 \cdot 10^4$

H

444 pm  
(1.5 hr run)

$$\left\{ \begin{array}{r} 641 \\ 598 \\ 584 \\ \hline 1824 \\ 3 \end{array} \right. = 608$$

$\times 10^4$

---

Spent test checked 330 pm

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Proposed experiment: amylase rate  
to T<sub>3</sub> resistance with amylase.  
Use at a high flow rate to have  
best growth

Electrodeal Purification Co  
 "Supplement"  
 84 Purchase Street Boston Mass

See 15/48  
 Plates from Dec 14/48 845 AM  
Assessment:  $a = 0.2$   $W = 6$

Plates  $\times 2 \times 10^3$   
 with T<sub>7</sub> 90  $\times 2 \times 10^3$

This shows contaminant present!

Plates =	450	}	411	=	$455 - 90 = 365$	
same with T <sub>7</sub>	503		<u>1364</u>		$3$	$2 \times 3.65 \times 10^5 =$
<del>496</del> $\times 2 \times 10^3$						$P_2 = 7.30 \times 10^5$

$C = 0.45$  micropure plates  
 yesterday for same flow rate  
~~496~~  
 $P_{1ms} = 2.6 \times 10^5$   
 $P_{2ms} = 8 \times 10^5$

$$C = \frac{P_2 a_1 - P_1 a_2}{P_2 - P_1}$$

Chromostat

Plates from bee 11 2 pm

H

0.1 cc + T<sub>7</sub> 2 colonies(?)

~~132~~ } 132  
~~141~~ } 141  
~~120~~ } 120

$\times 10^3$

{ 1 cc pipettes used }  $\frac{393}{3} = 131$   $131 \times 2 \times 10^3$   
 { 1/2 cc plated }  $= 2.62 \times 10^5$

1 microgram plates in flask =  $10^{-9}$  gm/cc  
~~2.10~~  $\frac{1}{3} 10$   $\frac{10^9}{2.5 \times 10^{-15}} = \frac{1}{3} 10^6 = \underline{\underline{4.4 \times 10^5}}$

Bee 13. Drop output of ATM Gauge 34'  
 volume: 10 cc in cylinder

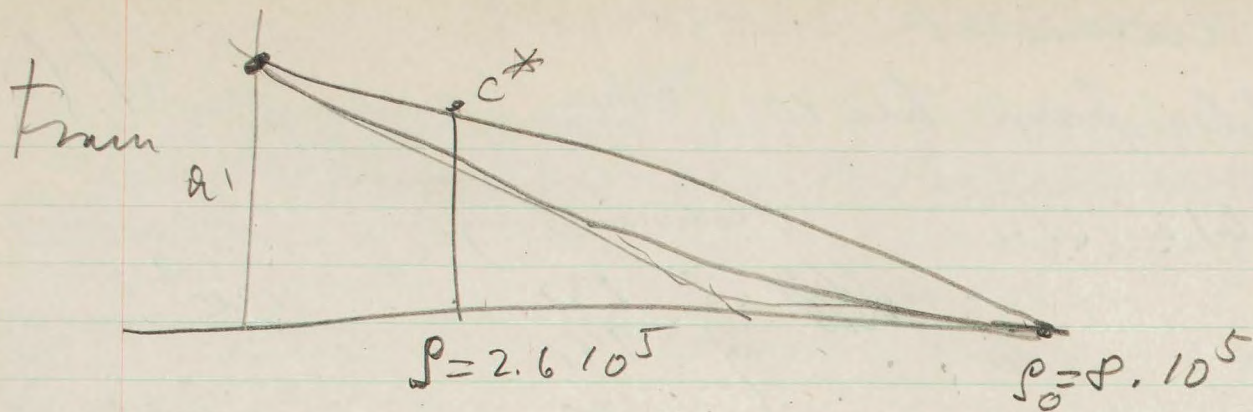
Bee 14/4P

Plates from Bee 13. 10 AM

0.1 cc + T<sub>7</sub> 216 These is presumably  
 contaminant. After  $10 \times 216 \approx 2000$   
 should give only 1 on other ( $2 \times 10^3$ ) plates

$8 \cdot 10^5$  / cc

{ 421  $\times 2 \times 10^3$   
 397  $\times 2 \times 10^3$   
 413  $\times 2 \times 10^3$   
 $\frac{1231}{4} = 4.07$



$$c < c^*$$

$$\frac{c^*}{a} = 1 - \frac{p}{p_0} = 0.675$$

$$\begin{array}{r} 10 \\ 33.25 \\ \hline 6.75 \end{array}$$

~~0.45~~ could be therefore  
really 0.45

Chromostat see 16/48

end of run. Yesterday (see 15):  
Dilce from growth tubes plated with T2  
shows strong contamination -

Growth tubes see 16/48

from yesterday's

Plates from see 15 48 hr cultures



Dec 15/48

HL

Plates from <sup>(14)</sup> growth tubes (24 h) grower  
~~at least 10~~

$$\frac{10 \mu\text{ / liter}}{10} \begin{matrix} 07 \\ 05 \end{matrix} = \times 10^3$$

low count

1  $\mu$  / liter

$$\begin{matrix} 171 \\ 165 \\ 170 \end{matrix} \times 3 \times 10^3$$

$$\frac{5069}{310^5} = [5 \times 10^5]$$

10  $\mu$  / liter

$$\begin{matrix} 567 \\ 602 \end{matrix} \times 10^4$$

$$\frac{592}{116 \frac{1}{3}} = 5.1 \times 10^6 \quad [5.9 \times 10^6]$$

100  $\mu$  / liter

$$\begin{matrix} 588 \\ 582 \end{matrix} \left. \begin{matrix} \phantom{0} \\ \phantom{0} \end{matrix} \right\} \begin{matrix} 3 \times 10^4 \\ 3 \times 10^4 \end{matrix}$$

$$\begin{matrix} 567 \\ 1737 \end{matrix} \left. \begin{matrix} \phantom{0} \\ \phantom{0} \end{matrix} \right\} \begin{matrix} 3 \times 10^4 \\ 3 \times 10^4 \end{matrix}$$

1000  $\mu$  / liter

$$\frac{1692 \frac{1}{4}}{426} = 4.2 \times 10^7 \quad [1.7 \times 10^7]$$

$$\begin{matrix} 305 \\ 420 \\ 487 \end{matrix} \left. \begin{matrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{matrix} \right\} \times 10^5$$

$$\frac{1692 \frac{1}{4}}{426} = 4.2 \times 10^7$$

Summary of this run  
Yesterday at same flow rate (2 h)  
we had  $P_{2h} = 2.6 \times 10^5$

from this and today's nature for  
PWB  $P_{2h} = 7.3 \times 10^5$

$$\frac{C}{a_1} = \frac{7.3 - 2.6 \times 2}{7.3 - 2.6} = \frac{7.3 - 5.2}{4.7} = \frac{2.1}{4.7}$$

$$= 0.45$$

23  
26  
47

~~1000~~  $\mu/l$

$$\begin{array}{r} 377 \\ 310 \\ 386 \\ \hline 1073 \\ \hline 3 \end{array}$$

$\times 3 \times 10^4$

$[1.07 \times 10^7]$

1000  $\mu/l$

$$\begin{array}{r} 310 \\ 340 \\ 378 \\ \hline 1028 \\ \hline 3 = 343 \end{array}$$

$\times 10^5$

$[3.43 \times 10^7]$

Concentration in  $\frac{1}{10} \mu/l$  Ryzostaphane

use equations

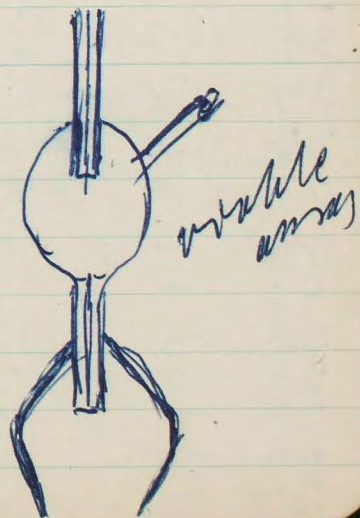
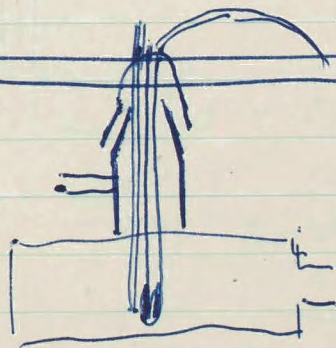
$$\left. \begin{array}{l} \frac{1}{r} \frac{dN}{dt} = dc \\ \frac{dc}{dt} = -\beta \frac{dN}{dt} \end{array} \right\}$$

$$\frac{1}{10} \mu/l \quad 209 \times 10^2 = [2 \cdot 10^4] \text{ H}$$

$$1 \mu/l \quad \begin{array}{r} 139 \\ 134 \\ 120 \\ \hline 393 \\ 3 \end{array} \times 3 \cdot 10^3 = [3.93 \cdot 10^5]$$

$$10 \mu/l \quad \begin{array}{r} 450 \\ 486 \\ 410 \\ \hline 1346 \\ 3 \end{array} \times 10^4 = [4.5 \cdot 10^6]$$

~~$$100 \mu/l \quad \begin{array}{r} 386 \\ 3 \end{array} \times 10^4$$~~





1 Saturday  
Sunday Dec 18<sup>th</sup>/48

Short

Single Bacteria growth exp.  
Single test tube incubated at 15°C  
Plating started 12:30 ended 1:50 pm.

11. Growth tube exper. Started on  
Saturday Dec 18<sup>th</sup> at 5 pm

100 cc total growth plates (with  $\frac{1}{3}$   
1, 0.3 and 0.1  $\mu$ /l) inoculated

with  $\frac{1}{10}$  cc taken from growth  
tube culture (only 1  $\mu$ /l  
bryophane from Dec 13<sup>th</sup>) array  
on Dec. 15<sup>th</sup> gave  $3.9 \times 10^5$ . Array  
at 5 pm Dec 18/48 :

$$\begin{array}{r} 239 \\ 287 \\ \hline 526 \\ \hline 2 \end{array} = 263 \times 10^3 = [2.63 \times 10^5]$$

Sunday  
Dec 19

Single Bacteria exp from yesterday  
plates:

B array at Dec 18 11 AM

$$\begin{array}{r} 419 \\ 376 \\ \hline 795 \\ \hline 2 \end{array} = 397 \quad \begin{array}{l} \times 10^5 \\ [4 \times 10^7] \\ \hline \end{array}$$

0.1  $\mu$ /l      463 }  
                   473 } } x100  
                   471 }

In to-days platings at 130 pm  
 the point 0.3 was plated on plates marked  
 0.1 and vice versa

p-1396

Oxygen in H<sub>2</sub>O

$$\frac{1}{5} \frac{5}{100} \text{ cc of } O_2 \text{ per cc} = \frac{1 \text{ cc of } O_2 \text{ per cc of H}_2\text{O}}{100}$$

Dec. 2/48

Plates from yesterday 130 pm  
 (Growth tubes exp.)

1  $\mu$ /l      141 }  
                   146 } } x2000  
                   119 }

0.3  $\mu$ /l      169 }  
                   157 } } x1000  
                   159 }

0.1  $\mu$ /l      412 }  
                   412 } } x200  
                   451 }

Dec. 20<sup>th</sup> / 48 Growth tubes exp <sup>M</sup>  
 Plates from yesterday (20 tubes) 1 pm  
 1  $\mu$ /l } 37  
           } 31  
           } 25

0.3  $\mu$ /l } 38  
           } 41  
           } 41                   x 210<sup>2</sup>

0.1  $\mu$ /l } 301  
           } 307  
           } 332                   x 10

~~1.6  $\times 10^5$  in 20 hours~~  
~~5  $\times 10^5$  in 24 hours.~~

Dec 21<sup>st</sup> / 48  
 Growth tubes; plates from  
 Dec 20/48 2:30 pm

1  $\mu$ /l } 220  
           } 211  
           } 187                   x 2 x 10<sup>3</sup>

0.3  $\mu$ /l } 149  
           } 149  
           } 160                   x ~~10~~ 10<sup>3</sup>

Dec 23<sup>rd</sup>

Temp of bath went up to 42° on Dec 22  
in the morning.

Plates from 145 pm Dec 23<sup>rd</sup>,

1  $\mu$ l/l { 21  
33 x 2000  
40

0.3  $\mu$ l/l { 107  
107 x 1000  
102

0.01  $\mu$ l/l { 315  
359 x 200  
319



Todmore

~~Teakle~~ (1930)

J. Am. Soc. Agron  
22 401 400

Soil Sc. 30 13-33

Teakle 1929

Plant Physiol. 4, 211

Teakle array for microscope

~~disneyford~~

$$\left. \begin{array}{r} 757 \\ 833 \\ \hline 1590 \\ 2 \end{array} \right\} \times 5 \cdot 10^4 = 745 = 3.72 \cdot 10^7$$

Pa camp. "in microscope"  
with  $4.2 \times 10^7$  total  
after lys'd  $2.2 \times 10^7$

Plates from 12<sup>th</sup> 1130 pm

11/1

37°

27°

$$0.01 \times 10 \left\{ \begin{array}{l} \text{spotted} \end{array} \right.$$

$$0.1 \times 10 \left\{ \begin{array}{l} 27 \\ 23 \end{array} \right.$$

$$1 \times 10^3 \left\{ \begin{array}{l} 62 \text{ [at } 5^{15} \text{ pm]} \\ 61 \end{array} \right.$$

$$0.3 \times 10^2 \left\{ \begin{array}{l} 8 \\ 8 \end{array} \right.$$

$$10 \times 2 \cdot 10^4 \left\{ \begin{array}{l} 249 \\ 266 \end{array} \right.$$

$$100 \times 5 \cdot 10^4 \left\{ \begin{array}{l} 368 \\ 356 \end{array} \right.$$

$$0.01 \times 10 \left\{ \begin{array}{l} 12 \\ 15 \end{array} \right.$$

$$0.1 \times 10 \left\{ \begin{array}{l} 19 \\ 17 \end{array} \right.$$

10<sup>3</sup>

$$0.3 \times 10^2 \left\{ \begin{array}{l} 4 \\ 6 \end{array} \right.$$

Jan 13<sup>th</sup>/49

Growth plates of

Plates from Jan 12, 5<sup>40</sup> pm

37

27

0.1 x 10

{ 22  
23

0.1 x 10

{ 15  
25

0.3 x 50

{ 17  
13

0.3 x 50

{ 5  
2

1 x 5 x 10<sup>2</sup>

{ 17  
21

10 x 10<sup>3</sup>

{ 257 in  
4 squares

100 x 10<sup>3</sup>

{ has many

second growth 37 plated ~~5~~<sup>30</sup>  $\mu$ m Jan 13<sup>th</sup>

$$\frac{1}{2} \text{ cc} + \frac{2}{10} T_7$$

$$\left\{ \begin{array}{r} 43 \\ 35 \\ \hline 78 \frac{1}{2} = 39 \end{array} \right.$$

or 78/cc

array for same  $\times 5 \cdot 10^4$

$$\left\{ \begin{array}{r} 402 \\ 392 \\ \hline 794 \frac{1}{2} = 397 \end{array} \right.$$

or  $\approx 2 \cdot 10^7$

or mutants to total

$$\textcircled{39/10^7}$$

second growth  $10^{10}$   $\mu$ m Jan 13<sup>th</sup> (37)

$$\frac{1}{2} \text{ cc} + \frac{2}{10} T_7$$

$$\left\{ \begin{array}{r} 226 \text{ (420 } \mu\text{m)} \\ 244 \\ \hline \end{array} \right.$$

or 452/cc  
~~488~~

100 pfl  
15 hours  
continuous

array for same  $\times 10^5$

$$\left\{ \begin{array}{r} 970 \text{ (430 } \mu\text{m)} \\ 1040 \\ \hline \end{array} \right.$$

or  $10^8$

$$\textcircled{45/10^7}$$
$$\textcircled{49/10^7}$$

5757 Kim Cook Miller

Jan 14

H

Mutation Experiments

First repressant (control) ( $100 \mu(L)$ ) regrown at 27  
 $\frac{2}{10} ce + \frac{2}{10} T_7$

plated 10 AM Jan 13<sup>th</sup>

$$\begin{cases} 11 \text{ ? (count)} \\ 33 \end{cases}$$

Very to same (27°)

$$\begin{cases} 293 \\ 314 \end{cases} \times 10^5$$

First repressant at 37°  $\frac{2}{10} ce + \frac{2}{10} ce T_7$   
plated 10 AM on Jan 4<sup>th</sup>

$$\begin{cases} 97 \\ 81 \\ \frac{178}{2} = 89 \end{cases}$$

or ~ 450/ce

Very to same

$$\begin{cases} 167 \\ 161 \\ \frac{328}{2} = 164 \end{cases}$$

$$\times 10^6 = 1.6 \times 10^8$$

This is  
constants for total

$$= \frac{450}{1.6 \times 10^8} =$$

$$\frac{450}{16} \times 10^7 = \frac{280}{10^7}$$

0.3  $\mu$ l from 440  $\mu$ m Jan 13<sup>th</sup>

(27)

$\left. \begin{array}{l} 17 \\ 14 \end{array} \right\} \times 10^2$

0.1  $\mu$ l from 440  $\mu$ m Jan 13<sup>th</sup>

$\left. \begin{array}{l} 19 \\ 22 \end{array} \right\} \times 10$

---

from 10<sup>25</sup>  $\mu$ m Jan 13<sup>th</sup> 37

0.1  $\mu$ l

$\left\{ \begin{array}{l} 28 \\ 46 \\ \hline 74 \\ \hline \frac{74}{2} = 37 \end{array} \right.$

$\times 10$

1  $\mu$ l

$\left\{ \begin{array}{l} 309 \\ 307 \end{array} \right.$

$\times 10^3$

65  
46

10  $\mu\text{l}$  from 440  $\mu\text{m}$  Jan 13

$$\left\{ \begin{array}{r} 23 \\ 70 \\ \hline 153 \\ \hline 2 \end{array} \right. \times 510^4 = 765$$

H  
370

100  $\mu\text{l}$  from 440  $\mu\text{m}$  Jan 13

$$\left\{ \begin{array}{r} 195 \\ 184 \\ \hline 379 \\ \hline 2 \end{array} \right. \times 10^5 = 189$$

1  $\mu\text{l}$  440  $\mu\text{m}$  Jan 13

$$\left\{ \begin{array}{r} 142 \\ 195 \\ \hline \end{array} \right. \times 2 \times 10^3$$

0.1  $\mu\text{l}$  from 440  $\mu\text{m}$  Jan 13

$$\left\{ \begin{array}{r} 32 \\ 19 \\ \hline \end{array} \right. \times 10$$

0.3  $\mu\text{l}$  from 440  $\mu\text{m}$  Jan 13

$$\left\{ \begin{array}{r} 63 \\ 67 \\ \hline \end{array} \right. \times 10^2$$

Jan 15<sup>th</sup> (Saturday)

Plates from 10 AM Jan 14

0.1  $\mu$ l

$\left. \begin{array}{l} 44 \\ 40 \end{array} \right\}$

$\times 10$

37°

0.3  $\mu$ l

$\left. \begin{array}{l} 2531 \\ 2444 \\ \text{not} \\ \text{counted} \end{array} \right\}$

$\times 10^4$

$\approx 2.5 \times 10^4$

1  $\mu$ l

$\left. \begin{array}{l} 242 \\ 262 \end{array} \right\} 252$

$\times 10^3$

$\approx 2.5 \times 10^5$

10  $\mu$ l

$\left. \begin{array}{l} 89 \\ 76 \\ \hline 165/2 = 83 \end{array} \right\}$

$\times 5 \times 10^4$

$\approx 4.25 \times 10^6$

100  $\mu$ l

$\left. \begin{array}{l} 150 \\ 182 \\ \hline 332/2 = 166 \end{array} \right\}$

$\times 10^5$

$\approx 1.66 \times 10^7$



mean  $10^{2.5}$  per Jan 13 37 *hl*

10  $\mu/l$  { 86  
67 }  $\times 5 \times 10^4$   
 $\frac{153}{2} = 76$

100  $\mu/l$  { 168  
168 }  $\times 10^5$

0.3  $\mu/l$  { 960  
966 }  $\times 10$

---

0.1  $\mu/l$  { 26  
15 }  $\times 10$  27

0.3  $\mu/l$  { 230  
253 }  $\times 10$

$T = 2.9$  hours seems built.

Wave for  $1 \mu\text{H}$

for  $10 \mu\text{H}$   $\mu T = \underline{70 \text{ min}}$

10 AM 13<sup>th</sup> 5000/cc

72 hours  $2 \times 10^4$

June 15<sup>th</sup> / 49 (Saburoles)

270

Plates from 10 ~~11~~ June 14

$$0.3 \mu\text{l} \left\{ \begin{array}{l} 525 \\ 491 \end{array} \right. \times 10$$
$$\frac{1016}{2} = 508 \quad \text{or } 5 \times 10^3$$

$$0.1 \left\{ \begin{array}{l} 19 \\ 33 \end{array} \right. \times 10$$
$$52 \frac{1}{2} = 26$$

---

Plates from ~~June 14~~ ~~11~~ June 14

550  $\mu\text{m}$

1  $\mu\text{l}$

$$\left\{ \begin{array}{l} 427 \\ 419 \end{array} \right.$$

$5 \times 10^2$

37

10  $\mu\text{l}$

$$\left\{ \begin{array}{l} \cancel{436} \\ \cancel{419} \\ 295 \\ 317 \end{array} \right.$$

$\times 10^4$

100  $\mu\text{l}$

$$\left\{ \begin{array}{l} 283 \\ 276 \end{array} \right.$$

$\times 5 \times 10^4$

100 µl  $\overline{\text{Wood}}$  neyrom  $\frac{1}{2}$  cc +  $\frac{2}{10}$  T<sub>6</sub>  
plated ~~from~~ 6 per 2x14

1515  
} not counted

100 µl  $\overline{\text{Wood}}$  neyrom ~~Na~~  $\frac{1}{2}$  cc +  $\frac{2}{10}$  T<sub>5</sub>  
15  
} 19

---

T<sub>6</sub> alone slow

T<sub>7</sub> alone

T<sub>5</sub> alone 6 calvices ( $\frac{2}{10}$  cc)

---

Amphibian exp

H

100  $\mu$ l 3rd reynold 1/2 cc + 2/10 T7  
 plated 6 pm Jan 14

{  
 433  
 449  
 882

882/cc

15  
 12 1/2  
 27.5 hrs  
 hammering

error to cause

{  
 1034  
 not counted

$\times 10^5$  to  $1.03 \times 10^8$

10  $\mu$ l first reynold plated 6 pm Jan 13  
 1/2 cc + 2/10 cc T7

{  
 174  
 139

#

error

{  
 399  
 366

$\times 5 \times 10^4$

5 T5 and T6 mixed up 2

10  $\mu$ l first reynold plated 6 pm Jan 13

1/2 cc + 2/10 T6

{  
 7  
 4

10  $\mu$ l first reynold plated 6 pm Jan 13

1/2 cc + 2/10 T5

{  
 20  
 29

Plates from 1045 am Jan 15

0.1  $\mu$ /l

{ 225  
180

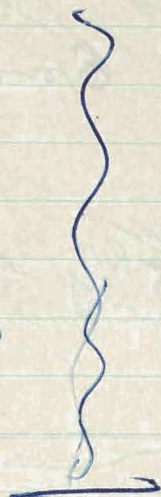
x 10

270

0.3  $\mu$ /l

{ 161  
148

x 100



Jan 16<sup>th</sup> Sunday

H

Plates from 1045 am Jan 15

0.14/l

{<sup>23</sup>  
22

$\times 10$

37°

0.34/l

{<sup>557</sup>  
516

$\times 10^2$

1 pl/l

{<sup>169</sup>  
198

$\times 510^2$

10 pl/l

{<sup>264</sup>  
272

$\times 10^4$

100

{<sup>264</sup>  
282

$510^4$



plates from ~~the~~ <sup>last night</sup> (2 am) 370

0.1  $\mu$ /l { 12  
              7                $\times 10$

0.3  $\mu$ /l { 97  
           93                $5 \times 10^2$

1  $\mu$ /l { 79  
       77                $5 \times 10^2$

10  $\mu$ /l { 176  
          195            $\times 10^4$

100  $\mu$ /l { 260  
           254            $5 \times 10^4$



8:15 pm Jan 16<sup>th</sup> Sunday

Plates from 2 am last night

0.1  $\mu$ /l

1672

27°

not count. X10

0.3  $\mu$ /l

125

155

2 10<sup>2</sup>

Membran exp calloused

10p/l

400

1/2 cc + T7

354

2nd regrow

array

600

612

$\times 10^5$

10p/l

29

1/2 cc + T6

26

10p/l

15

1/2 cc + T5

23 (?)



Muntalvans  
exp.

Monday Jan 17

Plates from 11 AM Jan 16

100  $\mu$ /l  
4th region  
1/2 cc + T<sub>7</sub>

$$\left\{ \begin{array}{l} 82 \\ 73 \\ \hline 155 \end{array} \right\} \frac{1}{2} = 77 \quad \text{or } 154/\text{cc}$$

assay

$$\left\{ \begin{array}{l} 216 \\ 233 \\ \hline 449 \end{array} \right\} \times 10^5 = 2.3 \cdot 10^7$$
$$\frac{449}{2} = 228 \quad \text{or } 228/10^7$$

100  $\mu$ /l  
4th region  
1/2 cc + T<sub>6</sub>

$$\left\{ \begin{array}{l} 338 \\ 312 \\ \hline 650 \end{array} \right\}$$

100  $\mu$ /l  
4th region  
1/2 cc + T<sub>5</sub>

$$\left\{ \begin{array}{l} 5 \\ 10 \end{array} \right\}$$

T<sub>7</sub> clear

T<sub>5</sub> ~ 100 colonies

T<sub>6</sub> clear

controls

67/107

continued

Mutabrous exp plotting with  
phages (before experiment)

$$\begin{array}{l} 100 \mu / l \\ \frac{1}{2} cc + T_7 \end{array} \left. \vphantom{\begin{array}{l} 100 \mu / l \\ \frac{1}{2} cc + T_7 \end{array}} \right\} 2$$

$$\begin{array}{l} 100 \mu / l \\ \frac{1}{2} cc + T_6 \end{array} \left. \vphantom{\begin{array}{l} 100 \mu / l \\ \frac{1}{2} cc + T_6 \end{array}} \right\} \begin{array}{l} 161 \\ \hline 206 \\ 367 \end{array} \quad \text{or } 302/107$$

$$\begin{array}{l} 10 \mu / l \\ \frac{1}{2} cc + T_7 \end{array} \left. \vphantom{\begin{array}{l} 10 \mu / l \\ \frac{1}{2} cc + T_7 \end{array}} \right\} \begin{array}{l} 0 \\ 1 \end{array}$$

$$\begin{array}{l} 10 \mu / l \\ \frac{1}{2} cc + T_6 \end{array} \left. \vphantom{\begin{array}{l} 10 \mu / l \\ \frac{1}{2} cc + T_6 \end{array}} \right\} \begin{array}{l} 0 \\ 0 \end{array}$$

before

Jan 17 Monday

Plakes train 11 AM Jan 16

370

$$0.1 \mu/l \quad \left\{ \begin{array}{l} 15 \\ 15 \end{array} \right. \quad \times 10$$

$$0.3 \mu/l \quad \left\{ \begin{array}{l} 93 \\ 93 \end{array} \right. \quad \times 5 \cdot 10^2$$

$$1 \mu/l \quad \left\{ \begin{array}{l} 39 \\ 42 \end{array} \right. \quad \times 5 \cdot 10^2$$

$$10 \mu/l \quad \left\{ \begin{array}{l} 194 \\ 171 \\ \hline 365 \frac{1}{2} = 182 \end{array} \right. \quad \times 10^4$$

$$100 \mu/l \quad \left\{ \begin{array}{l} 239 \\ 245 \\ \hline 484 \frac{1}{2} = 242 \end{array} \right. \quad \times 5 \cdot 10^4$$

---

27

$$0.3 \mu/l \quad \left\{ \begin{array}{l} 69 \\ 55 \\ \hline 124 \frac{1}{2} = 62 \end{array} \right. \quad 5 \cdot 10^2$$

Growth tube exp.

plates from 11 AM Jan 17

1  $\mu$ /l { 142  
          { 153  $\times 10^2$

Wednesday Jan 19/48

Plates from 11:55 pm Jan 17

(Monday exp)

0.3  $\mu$ /l { 163  $27^\circ$   
          { 147  $\times 2 \times 10^2$

100  $\mu$ /l

{ 215  
      { 187  $\times 5 \times 10^4$

10  $\mu$ /l

{ 143  
      { 128  $\times 10^4$

370

Thursday Jan 18/49  
Plates from 11 AM Jan 17

M

Mutabans exp.

100  $\mu$ l 5th re-grow  
 $\frac{1}{2}$  cc + T7

{ 106  
128  
234

or.  $\frac{140}{10^7}$

assay

{ 159  
174

$\times 10^5$

100  $\mu$ l  
 $\frac{1}{2}$  cc + T6

{ 257  
228

100  $\mu$ l  
 $\frac{1}{2}$  cc + T5

{ 25  
24

10  $\mu$ l 3rd re-grow

$\frac{1}{2}$  cc + T7

{ 90  
101

assay

{ 94  
100

$\times 10^5$   $\frac{17}{4}$  alone

$\frac{1}{2}$  cc + T6

{ 3  
2

T6 alone  
O.K.

~~assay~~  $\frac{1}{2}$  cc + T5  
T5 alone

{ 32  
190

T5 alone  
35!!

100  $\mu$ /l "before"

$\frac{1}{2}$  cc + T7

$$\left. \begin{array}{l} 23 \\ 22 \end{array} \right\}$$

$\frac{1}{2}$  cc + T6

$$\left. \begin{array}{l} 0 \\ 0 \end{array} \right\}$$

10  $\mu$ /l flash

array

$$\left. \begin{array}{l} 84 \\ 95 \end{array} \right\}$$

$$\times 5 \cdot 10^4$$

10  $\mu$ /l before

$\frac{1}{2}$  cc + T7

$$\left. \begin{array}{l} 0 \\ 1 \end{array} \right\}$$

$\frac{1}{2}$  cc + T6

$$\left. \begin{array}{l} 6 \\ 11 \end{array} \right\}$$

T7 alone clear

T6 alone clear

$10^4$   $\mu$ /l flash

array

$$\left. \begin{array}{l} 225 \\ 229 \\ \hline 454\frac{1}{2} \end{array} \right\}$$

$$= 227 = 6.8 \cdot 10^7$$

$\frac{1}{2}$  cc + T7

$$\left. \begin{array}{l} 226 \\ 239 \\ \hline 465 \end{array} \right\}$$

$$\text{or } \frac{465}{6.8} \cdot 10^7$$

$10^2$   $\mu$ /l flash

array

$$\left. \begin{array}{l} 185 \\ 188 \\ \hline 383\frac{1}{2} = 191 \end{array} \right\}$$

$$\times 10^5 \text{ or } 1.9 \cdot 10^7$$

$\frac{1}{2}$  cc + T7

$$\left. \begin{array}{l} 29 \\ 26 \\ \hline 55 \end{array} \right\}$$

$$\text{or } \left( \frac{29}{10} \right)^7$$

$$\frac{29^7}{10^7}$$



1  $\mu$ /l { 131  
84 x 100

4

---

Prelude to delayed expression  
experiment [ into  $10^2$   $\mu$ /l and into  $10^4$   $\mu$ /l ]  
from 100  $\mu$ /l flask  
started at 1155 pm Jan 17  
"before"

1/2 cc x T<sub>7</sub> { 3  
3

---

Prelude to 16 ~ T<sub>7</sub> mutants exp  
array for No

1/2 cc x T<sub>7</sub> { 437  
393 10<sup>5</sup>

---

~~16 ~ T<sub>7</sub> mutants experiment~~  
Plates from 230 pm Jan. 18 (11 pm <sup>holding</sup> see <sub>later</sub>)

100  $\mu$ /l flask array { 202  
300 5 10<sup>4</sup>

Plates from 930 pm Jan 10  
from 10<sup>4</sup> flock

$$\frac{1}{2} ce + T_7 \left\{ \begin{array}{l} 661 \\ 685 \\ \hline 1346 \end{array} \right.$$

$$\frac{1346}{27} = 50/10^7$$

array

$$\left\{ \begin{array}{l} 277 \times 10 \\ 259 \\ \hline 536/2 = 268 \end{array} \right. [2.7 \times 10^8]$$

$$\frac{1}{2} ce + T_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

T<sub>2</sub> clear T<sub>2</sub> clear

10<sup>2</sup> flock array

$$\left\{ \begin{array}{l} 213 \\ 189 \\ \hline 41 1/2 = 205 \end{array} \right. \times 10^5 \quad 2 \times 10^7$$

$$\frac{1}{2} ce + T_7 \left\{ \begin{array}{l} 45 \\ 33 \end{array} \right.$$

$$\frac{1}{2} ce + T_2 \left\{ \begin{array}{l} 78 \\ 0 \\ 0 \end{array} \right.$$

$$39/10^7$$

Plates from 930 pm Jan 10 (regraw I)

100 p/d regraw I

$$\frac{1}{2} ce + T_7 \left\{ \begin{array}{l} 19 \\ 24 \\ \hline 43 \end{array} \right.$$

$$\frac{43}{275} = 15.5/10^7$$

array

$$\left\{ \begin{array}{l} 275 \\ 275 \\ \hline 550/2 = 275 \end{array} \right. \times 10^5 = 2.75 \times 10^7$$

$$\frac{1}{2} ce + T_6 \left\{ \begin{array}{l} 2 \\ 1 \end{array} \right.$$

$$\frac{1}{2} ce + T_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

15.5

Plates from 11 am Jan 18

H

$$10^4 \mu\text{l} \text{ flock array} \left\{ \begin{array}{l} 86 \\ 70 \\ \hline 156 \\ \hline 2 \end{array} \right. \times 10^5 = 7.8 \times 10^6$$

$$\frac{1}{2} \text{ cc} \times T_7 \left\{ \begin{array}{l} 20 \\ 14 \\ \hline 34 \end{array} \right. \frac{34}{0.78} =$$

$$10^2 \mu\text{l} \text{ flock array} \left\{ \begin{array}{l} 91 \\ 70 \\ \hline 161 \\ \hline 2 \end{array} \right. \times 10^5 = 85 = 8.5 \times 10^6$$

$$\frac{1}{2} \text{ cc} \times T_7 \left\{ \begin{array}{l} 13 \\ 18 \\ \hline 31 \end{array} \right. \frac{31}{2.16} =$$

---

$T_7$  alone  $\angle 2$

---

100  $\mu\text{l}$

$$\left\{ \begin{array}{l} 219 \\ 202 \end{array} \right. \times 5 \times 10^4$$

death exp

10  $\mu\text{l}$

$$\left\{ \begin{array}{l} 180 \\ 158 \end{array} \right. \times 10^4$$

1  $\mu\text{l}$

$$\left\{ \begin{array}{l} 78 \\ 68 \end{array} \right. \times 10^2$$

10 p/h

$$\frac{1}{2} \text{cc} + T_7 \left\{ \begin{array}{l} 3 \\ 3 \end{array} \right.$$

Wahl

$$\text{array} \left\{ \begin{array}{l} 96 \\ 110 \\ \hline 206 = 103 \end{array} \right. \quad 5 \cdot 10^4 = 5 \cdot 10^6$$

$$\frac{1}{2} \text{cc} + T_6 \left\{ \begin{array}{l} 11 \\ 6 \\ \hline 17 \end{array} \right.$$
$$\frac{1}{2} \text{cc} + T_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

---

100  $\mu$ /l regrow-I

H

$$\frac{1}{2} \text{cc} + \bar{T}_7 \left\{ \begin{array}{l} 8 \\ 2 \end{array} \right.$$

$$\text{array} \left\{ \begin{array}{l} 52 \times 10^5 \\ \frac{71}{12 \frac{3}{2}} = 0.61 \times 10^7 \end{array} \right.$$

$$\frac{1}{2} \text{cc} + \bar{T}_6 \left\{ \begin{array}{l} 11 \\ 9 \\ \hline 20 \end{array} \right.$$

T<sub>6</sub> alone  
clear

$$\frac{1}{2} \text{cc} + \bar{T}_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

Plates from 11 pm Jan 18

100  $\mu$ /l "before" (regrow-II)

$$\frac{1}{2} \text{cc} + \bar{T}_7 \left\{ \begin{array}{l} 32 \\ 35 \end{array} \right.$$

$$\text{array} \left\{ \begin{array}{l} ~~175~~ 207 \times 10^5 = 1.9 \times 10^7 \\ \frac{382}{2} = 191 \end{array} \right.$$

$$\frac{1}{2} \text{cc} + \bar{T}_6 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

$$\frac{1}{2} \text{cc} + \bar{T}_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

Plankton 11 AM Jan 18

Death rates:

10 ppt

135

124

$\times 10^4$

100 ppt

216

230

$\times 5 \times 10^4$

1 pt

102

76

$\times 50$



H

Thursday Jan 20  
 plates from 10 AM Jan 19  
second regrow

from 100  $\mu$ /l  $\frac{1}{2}cc + T_7$   $\left\{ \begin{array}{l} 28 \\ 33 \\ \hline 61 \end{array} \right.$   $\frac{61}{4.7} = \frac{13}{10^7}$

array  $\left\{ \begin{array}{l} 515 \\ 470 \end{array} \right.$   $\times 10^5$

$\frac{1}{2}cc + T_6$   $\left\{ \begin{array}{l} 0 \\ - \end{array} \right.$

$\frac{1}{2}cc + T_2$   $\left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

T<sub>6</sub> clearT<sub>7</sub> clearT<sub>2</sub> clear

from 100  $\mu$ /l array  $\left\{ \begin{array}{l} 129 \\ 119 \\ \hline 248 \frac{1}{2} = 124 \end{array} \right.$   $\times 10^5$

$\frac{1}{2}cc + T_7$   $\left\{ \begin{array}{l} 12 \\ 16 \\ \hline 28 \end{array} \right.$   $\frac{28}{1.24} = \frac{22.5}{10^7}$

$\frac{1}{2}cc + T_6$   $\left\{ \begin{array}{l} 21 \\ 20 \\ \hline 41 \end{array} \right.$

$\frac{1}{2}cc + T_2$   $\left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

Plates from 11 pm Jan 20

⑤  
 $T_2$  clear

$$\frac{1}{2} cc + T_7 \left\{ \begin{array}{l} 106 \\ 120 \\ \hline 227 \end{array} \right.$$

45 / 10<sup>7</sup>

(input  $14.8 \times 10^7$ )  
 rise  $\frac{510}{150}$  error (5.1  $\mu m$ )

$$\left\{ \begin{array}{l} 259 \\ 251 \\ \hline 510 \end{array} \right. \times 2 \times 10^5 = 5.1 \times 10^7$$

5  
 2  
 9  
 =

⑦  
 $T_2$  clear

$$\frac{1}{2} cc + T_7 \left\{ \begin{array}{l} 151 \\ 174 \\ \hline 325 \end{array} \right.$$

68 / 40<sup>7</sup>

(input  $3.72 \times 10^7$ ) (7.0  $\mu m$ )  
 rise<sup>2</sup> =  $\frac{480}{3.7}$

error  $\left\{ \begin{array}{l} 228 \\ 257 \\ \hline 485 \end{array} \right. \times 2 \times 10^5 = 4.8 \times 10^7$

⑨  
 $T_2$  clear

input  
 $(6.96 \times 10^7)$   
 rise  $\frac{3270}{7}$  (8.9  $\mu m$ )

$$\frac{1}{2} cc + T_7 \left\{ \begin{array}{l} 384 \\ 414 \\ \hline 798 \end{array} \right. \quad \frac{798}{32.7} = 24.5 / 10^7$$

error  $\left\{ \begin{array}{l} 337 \times 10^6 \\ 324 \\ \hline 655 \end{array} \right. = 3.27 \times 10^8$



Jan 21st (Friday)

H

Plates from 11 pm Jan 19 (two days ago)

100  $\mu$ /l

$\frac{1}{2}$  cc + 10 {  
before

assay

$$\left\{ \begin{array}{l} 181 \\ 197 \\ \hline 378 \\ \hline \frac{378}{2} = 189 = 9.5 \times 10^6 \end{array} \right. \quad 5 \times 10^4$$

$\frac{1}{2}$  cc + 10 {  
235  
164

5  
7  
9  
11

ChemoStat

Plates from ~~Jan 19~~

11 am Jan 20

~~11 pm Jan 19~~

$$\left\{ \begin{array}{l} 254 \\ \frac{264}{518} \times 10^3 = 259 \\ \hline \frac{264}{518} \times 10^3 = 259 = 2.59 \times 10^5 \end{array} \right.$$

$\frac{1}{2}$  cc + 10 {  
0  
0

Plates from 11 pm Jan 20<sup>th</sup>

$$\left\{ \begin{array}{l} 272 \\ \frac{256}{528} \times 10^3 = 264 \\ \hline \frac{256}{528} \times 10^3 = 264 = 2.64 \times 10^5 \end{array} \right.$$

$\frac{1}{2}$  cc + 10 {  
1

Jan 22 not Saturday

Chernostat

plates from noon (12 o'clock) Jan 21

$$\frac{1}{2}cc + T_2 \begin{cases} 0 \\ 0 \end{cases} \quad \text{avg} \left\{ \begin{array}{l} 255 \times 10^3 \\ 234 \end{array} \right. = 2.45 \times 10^5$$

$$\begin{array}{r} 489 \\ 255 \\ \hline 234 \end{array}$$

$$\frac{489}{2} = 245$$

flow rate changed by  
1st min repr. done at noon  
plates from 6 pm Jan 21 Jan 21

$$\frac{1}{2}cc + T_2 \begin{cases} 0 \\ 0 \end{cases} \quad \text{avg} \left\{ \begin{array}{l} 270 \\ 250 \end{array} \right. \times 10^3 = 2.6 \times 10^3$$

$$\frac{520}{2} = 260$$

plates from 11 pm Jan 21

$$\frac{1}{2}cc + T_2 \begin{cases} 1 \\ 0 \end{cases} \quad \left\{ \begin{array}{l} 246 \times 10^3 \\ 232 \end{array} \right. \quad 2.4 \times 10^5$$
$$\frac{478}{2} = 239$$

on plan Chernostat  
at 51.5 sec. (2 hr at 12cc = V) started  
at 5 pm (liquid collection started)

48/107

11

T<sub>2</sub> clear

$$\frac{1}{2} \text{cc} + T_7 \left\{ \begin{array}{r} 703 \\ 247 \\ \hline 1630 \end{array} \right.$$

$$\frac{1630}{33.8} =$$

(input rise  $1.73 \times 10^7$ )  
 $\frac{3380}{1.73}$   
 (10.9 pm)

avg }  $\frac{340}{329}$   $\times 10^6$   
 $\frac{677}{2} = 3.38 \times 10^8$

11 narrow plates 11 30 pm Jan 20

+T<sub>2</sub> clear

100 p/d

$$\frac{1}{2} \text{cc} + T_7 \left\{ \begin{array}{r} 67 \\ 4 \\ \hline 13 \end{array} \right. \frac{7}{6}$$

avg }  $\frac{164}{173} \times 10^5$

$$\frac{1}{2} \text{cc} + T_6 \left\{ \begin{array}{r} 51 \\ 1 \end{array} \right. \frac{337}{2} = 169 = 1.7 \times 10^7$$

Twin Val from 4 pm yesterday to  
1230 pm today 185 cc =

---

Monday Jan 24

Chemostat (twin) plates from  
1045 pm Jan 22

$\left\{ \begin{array}{l} 200 \\ 218 \end{array} \right. \times 10^3$

12<sup>30</sup> pm Jan 23  $\left\{ \begin{array}{l} 202 \\ 209 \end{array} \right. \times 10^3$

+ Tr  $\left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

---

Rate exp. chem. orphan  
Plates from 1045 pm Jan 22

avg  $\left\{ \begin{array}{l} 179 \\ 169 \end{array} \right. 3 \times 10^5$   
 $\frac{348}{2} = 174 \quad 5.22 \times 10^7$

$\frac{1}{2}$  cat T7  $\left\{ \begin{array}{l} 36 \\ 43 \end{array} \right.$

$\frac{1}{2}$  cat T6  $\left\{ \begin{array}{l} 3 \\ 2 \end{array} \right.$

Sunday Jan 23

M

Chromatograms (Amies) plates  
from 10:30 AM Jan 22

$$\frac{1}{2} \text{ cc } T_2 \begin{cases} 0 \\ 0 \end{cases} \text{ array } \begin{cases} 223 \\ 212 \end{cases} \times 10^3$$

$$\frac{435}{2} = 2.17 \times 10^5$$

Flow rate changed to  $\frac{1}{2}$  g/min at 11 AM Jan 22

$$\text{from } 3:30 \text{ pm array } \begin{cases} 235 \\ 252 \end{cases} \times 10^3$$

$$\frac{487}{2} = 2.47 \times 10^5$$

Old death rates (counted Nov Jan 24)

~~100  $\mu$ /l~~ Plates from 5 pm Jan 22

$$100 \mu/l \begin{cases} 160 \\ 176 \end{cases} \times 5 \cdot 10^4$$

$$\frac{336}{2} = 168 \quad 37$$

$$\text{circled: } 8.40 \times 10^6$$

$$10 \mu/l \begin{cases} 96 \\ 115 \end{cases} \times 5 \cdot 10^3$$

$$\frac{211}{2} = 105.5$$

$$\text{circled: } 5.23 \times 10^5$$

$$1 \mu/l \begin{cases} 100 \\ 114 \end{cases} \times 10$$

$$\frac{214}{2} = 107$$

$$\text{circled: } 1.07 \times 10^3$$

$$0.3 \mu/l \begin{cases} 273 \\ 261 \end{cases} \times 100$$

$$\frac{534}{2} = 2.67 \times 10^4$$

Drop rates at 12 noon

Truband 25.2 sec Drop time 51.5 sec

Vol from 5 pm to 12:15 pm today Oropharynx:

~~100 cc~~ or 6.4 cc/h

Twin plates from 9 AM June 20

$$+T_2 \begin{cases} 1 \\ 3 \end{cases}$$

$$\text{avg} \begin{cases} .178 \\ 155 \\ \hline 333 \end{cases} \times 210^3 = 3.33 \cdot 10^5$$

---

Mutated on the plates June 28 11 AM

$$K_2 + T_2 \begin{cases} 0 \\ 0 \end{cases}$$

$$1 + T_6 \begin{cases} 30 \\ 38 + \text{cont} \end{cases}$$

$$1 + T_7 \begin{cases} 104 \\ 87 \end{cases}$$

$$\text{avg} \begin{cases} 360 \\ 243 \end{cases} \times 210^5$$

H

Saturday Jan 29 4 pm  
Plates

<sup>100</sup>  
before II Jan 28 11 am  
 $\frac{1}{2} \text{cc} + T_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

~~1~~cc + T<sub>6</sub>  $\left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

array  $\left\{ \begin{array}{l} 175 \\ 173 \times 10^5 \\ \hline 348 \\ 2 \end{array} \right. = 1.74 \times 10^7$

1cc + T<sub>7</sub>  $\left\{ \begin{array}{l} 26 \\ 29 \\ \hline 55/2 \end{array} \right. = 27 / 1.74 = 15.5 / 10^7$

<sup>100</sup>  
after I Jan 28 11 am

array  $\left\{ \begin{array}{l} 273 \text{ (const)} \\ 278 \times 2 \times 10^5 \\ \hline 551 \end{array} \right. = 5.51 \times 10^7$

1cc + T<sub>7</sub>  $\left\{ \begin{array}{l} 167 \\ 133 \\ \hline 300/2 \end{array} \right. = 150 / 5.51 = 27 / 10^7$

1cc + T<sub>6</sub>  $\left\{ \begin{array}{l} 8 \\ 9 \end{array} \right. = 8.5$

$\frac{1}{2} \text{cc} + T_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

array  $\left\{ \begin{array}{l} 5.75 \times 10^5 \end{array} \right.$

Mount same plates from Jan 31 10:30 AM

$$\begin{cases} 88 \\ 93 \end{cases} \times 210^5$$
$$\frac{181}{2} = 90$$

$$\frac{1}{2} + T_2 \begin{cases} 2 \\ 0 \end{cases}$$

$$1 + T_6 \begin{cases} 23 \\ 19 \end{cases}$$
$$\frac{42}{2} = 21$$

$$1 + T_7 \begin{cases} 154 \\ 135 \end{cases}$$
$$\frac{289}{2} = 144$$

Wednes. Febr. 2

Turnin from Febr 1st 9:30 AM

$$\text{growth bubble} + T_2 \begin{cases} 0 \\ 0 \end{cases}$$

$$\text{bubble} + T_2 \begin{cases} 0 \\ 1 \end{cases}$$

$$\text{growth bubble array} \begin{cases} 44 \\ 31 \end{cases} \times 510^3$$

$$\frac{75}{2} = 37$$

$$\underline{\text{bubble}} \text{ array} \begin{cases} 0 \\ 2 \end{cases} \times 10$$



Tuesday Feb 1st

H

100 after II from Jan 31 10<sup>30</sup> AM

$$1 + T_6 \begin{cases} 2 \\ 10 \end{cases}$$

$$\frac{1}{2} + T_2 \begin{cases} 2 \\ 0 \end{cases}$$

$$1 + T_7 \begin{cases} 159 \\ 128 \end{cases} \quad \frac{143}{4.57} = 36/10^7$$

array

$$\begin{cases} 236 \\ 221 \end{cases} \times 210^5$$

$$\frac{457}{4.57} = 4.57 \cdot 10^7$$

1 min Plates from Jan 31 10<sup>30</sup> AM

$$\begin{cases} 31 \\ 21 \end{cases} \quad \frac{510^3}{52} = 26 \times \quad [1.3 \cdot 10^5]$$

$$+ T_2 \begin{cases} 1 \\ 2 \end{cases}$$

100 Ref III. plates from Jan 31 10<sup>30</sup> AM

$$\frac{1}{2} + T_2 \begin{cases} 3 \\ 1 \end{cases}$$

$$1 + T_6 \begin{cases} 4 \text{ ? ant} \\ 1 \end{cases}$$

$$1 + T_7 \begin{cases} 8 \\ 10 \end{cases}$$

array

$$\begin{cases} 94 \\ 88 \end{cases} \times 10^5$$

$$\frac{182}{2} = 91 = 9.1 \cdot 10^6$$

~~What are plates from Feb 1 3 pm~~

140 before IV plates from

Peter 2

$$\text{avg} \begin{cases} 61 \\ 65 \end{cases} \times 10^5$$

$$\underline{\quad} = 6.3 \times 10^6$$

$$\frac{1}{2} + T_2 \begin{cases} 1 \\ \text{count} \end{cases}$$

$$1 + T_6 \begin{cases} 0 \\ 0 \end{cases}$$

$$1 + T_7 \begin{cases} 0 \\ \text{count} \end{cases}$$

Feb 4<sup>th</sup> Plates from 6 pm Feb 3<sup>rd</sup>  
after III repeat

$$\text{avg} \begin{cases} 201 \\ 202 \\ \hline 403 \end{cases} \times 2 \times 10^5 \quad \frac{1}{2} + T_2 \begin{cases} 0 \\ - \end{cases}$$

$$4.0 \times 10^7$$

$$1 + T_6 \begin{cases} 28 \\ 10 \end{cases}$$

$$1 + T_7 \begin{cases} 134 \\ 155 \text{ since} \\ \hline 289 \\ \hline 144.5 \end{cases}$$

after IV

$$\text{avg} \begin{cases} 265 \\ 233 \\ \hline 498 \end{cases} \times 2 \times 10^5 \quad \frac{1}{2} + T_2 \begin{cases} 0 \\ 0 \end{cases}$$

$$5.0 \times 10^7$$

$$1 + T_6 \begin{cases} 33 \\ - \text{count} \end{cases}$$

$$1 + T_7 \begin{cases} 103 \\ 139 \\ \hline 242 \\ \hline 121 \end{cases}$$

Mut rate plates from Febr. 3<sup>rd</sup> pm 11

left  
 $\frac{1}{2} + T_2$

array  $\left\{ \begin{array}{l} 73 \\ 88 \\ \hline 161 = 80 \end{array} \right. \begin{array}{l} 2 \cdot 10^5 \\ [1.6 \cdot 10^7] \end{array}$

$1 + T_6 \left\{ \begin{array}{l} \text{cont (12)} \\ 13 \end{array} \right.$

$1 + T_7 \left\{ \begin{array}{l} 92 \end{array} \right.$

Thursday Febr 3<sup>rd</sup>

Mut. rate from Febr 2

array  $\left\{ \begin{array}{l} 243 \\ 233 \\ \hline 9 \end{array} \right. \begin{array}{l} \times 10^5 \\ \\ = 2.38 \cdot 10^7 \end{array}$

$1 + T_7 \left\{ \begin{array}{l} 89 \\ 98 \end{array} \right.$

$1 + T_6 \left\{ \begin{array}{l} 23 \\ - \end{array} \right.$

$\frac{1}{2} + T_2 \left\{ \begin{array}{l} \text{many} \\ \text{counts} \\ \sim 100 \end{array} \right.$

100 After III plates from Febr 2<sup>nd</sup>

$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$

$1 + T_6 \left\{ \begin{array}{l} 20 \\ 12 \end{array} \right.$

$1 + T_7 \left\{ \begin{array}{l} 114 \\ 141 \end{array} \right. \text{reinc.}$

array  $\left\{ \begin{array}{l} \text{cont. 2} \\ \text{cont. 2} \end{array} \right. \times 2 \cdot 10^5$

$\frac{255}{2} = 127$

Twin running at [ 0.4  $\mu$ /l 120 min ]  
plates from 10 AM Feb 4

$$\text{avg} \left\{ \begin{array}{l} 225 \\ 229 \end{array} \right\} \times \text{count} 30 \\ \hline = 30 \times 227 \quad [6.7 \cdot 10^3]$$

---

MR-2 plates from 10 AM Feb 4

$$\text{avg} \left\{ \begin{array}{l} 255 \\ 273 \end{array} \right\} \times 2 \cdot 10^5 \\ \hline 528 = [5.28 \cdot 10^7]$$

$$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 0 \\ 23 \end{array} \right\} \\ \hline \frac{42}{2} = 21$$

$$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 85 \\ 81 \end{array} \right\}$$

Unit Rate (2) Plates from 6 pm Febr 3

$$\left. \begin{matrix} 1/2 + T_2 \\ 0 \end{matrix} \right\} \begin{matrix} 0 \\ 0 \end{matrix} \text{ array} \rightarrow \begin{cases} 202 \\ 181 \end{cases} \times 10^5$$


---


$$383 \quad 3.8 \times 10^7$$

$$1 + T_6 \begin{cases} 19 \\ 21 \end{cases}$$

$$1 + T_7 \begin{cases} 86 \\ 87 \end{cases}$$

Iron in ~~plates~~ [new run] plates from 6 pm Febr 3

$$\left. \begin{matrix} 1/2 + T_2 \\ 0 \end{matrix} \right\} \begin{matrix} 1 \\ 0 \end{matrix} \text{ array} \begin{cases} 65 \\ 60 \end{cases} \times 10^2$$


---


$$\frac{125}{2} = 62 \quad 6.2 \times 10^3$$

~~Water~~ Saturday Febr 5th

Ostracods plates from 10 AM Febr 40

$$\text{back of twin (2 p/d) right} \begin{cases} 512 \\ 520 \end{cases} \times 2 \times 10^3$$

$$\text{back of N. Pool} \rightarrow \left. \begin{matrix} 1/2 + T_2 \\ 0 \end{matrix} \right\} \begin{matrix} 0 \\ 0 \end{matrix}$$


---


$$\begin{cases} 192 \\ 208 \end{cases} \times 10^5$$


---


$$\frac{1/2 + T_2 \begin{cases} 0 \\ 0 \end{cases}}{2} = 2 \times 10^7$$

Monday Feb 7<sup>th</sup>  
 Restes from 10:30 AM Feb 6<sup>th</sup>  
 Twin [2<sup>nd</sup> min = 0]

$$\left\{ \begin{array}{l} 463 \\ 414 \end{array} \right\} \times 50$$

$$\frac{877-438}{2} = 22000$$

MR-2

$$\text{mm} \left\{ \begin{array}{l} 280 \\ 264 \end{array} \right\} \times 210^5$$

$$\frac{544}{\text{mm}} \text{ ARMM} \approx 5.44 \cdot 10^7$$

$$\frac{1}{2} + \frac{1}{2} \int 0$$

H.

Sunday Feb 6

Plates from from mass (120 d.) Feb 5<sup>th</sup>  
Twin (0.4 p/l)  
error

$$\left. \begin{array}{r} 292 \\ 253 \end{array} \right\} \times 35$$

$$\frac{545}{2} = 272.5 \times 35 = 9.5 \times 10^3$$

T<sub>2</sub> alone clear

$$1/2 + T_2 \left\{ \begin{array}{l} 0 \end{array} \right.$$

MR-2

error

$$\left. \begin{array}{r} 309 \\ 319 \end{array} \right\} 2 \times 10^5$$

$$\frac{628}{1} = 6.28 \times 10^7$$

$$1/2 + T_2 \left\{ \begin{array}{l} 3 \end{array} \right.$$

$$1 + T_6 \left\{ \begin{array}{l} 34 \\ 39 \end{array} \right.$$

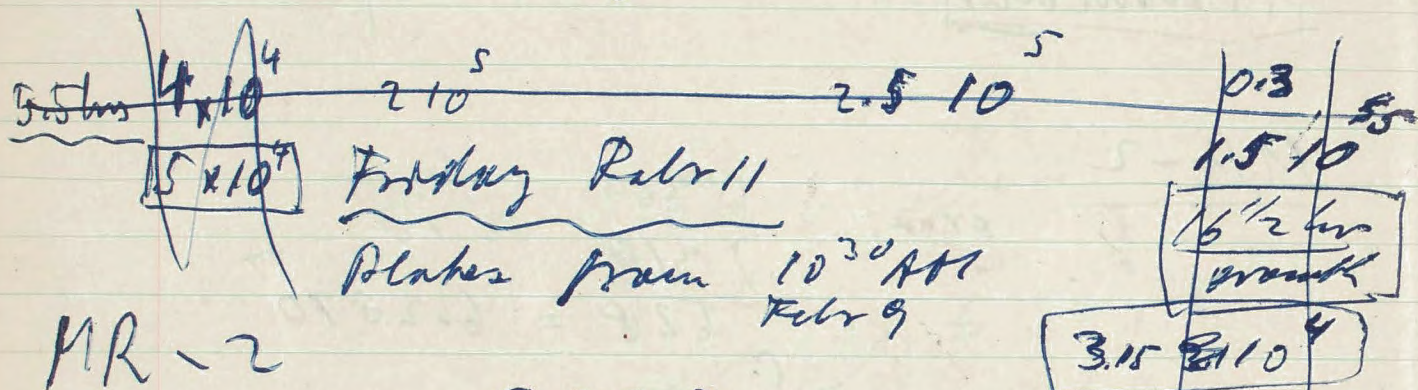
$$T_6 \text{ alone} \left\{ \begin{array}{l} 0 \\ 0 \end{array} \right.$$

$$1 + T_7 \left\{ \begin{array}{l} 110 \\ 141 \end{array} \right\} \text{ because of const. } \left\{ \begin{array}{l} 2 \text{ revise} \\ 0 \end{array} \right.$$

MR-2 plates from 10 AM Feb 8

$$\text{array } \left\{ \begin{array}{l} 135 \\ 157 \\ \hline 292 \end{array} \right. \times 2 \cdot 10^5 = 2.8 \cdot 10^7 \text{ (low!)}$$

contaminant present in amount of.

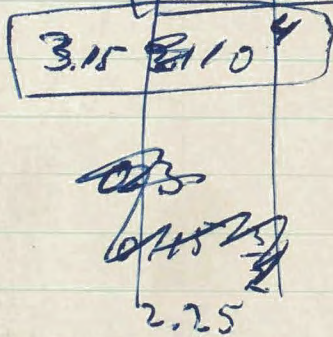


MR-2

$$17 \text{ Tg } \left\{ \begin{array}{l} 220 \\ \text{cont.} \end{array} \right.$$

$$\left( \text{array } 5.6 \cdot 10^7 \right)$$

$$\frac{1}{2} + 12 \left\{ \begin{array}{l} 106 \\ \text{---} \end{array} \right. \text{ or } 212 / \text{liter} / \text{cc}$$





Wednesday Febr 9  
~~plates from 11 am Febr 7~~ Twinn ( $0.4 \mu/l$ )  
 plates from 11 am Febr 7  $\bar{c} = 5.5 \text{ hrs}$

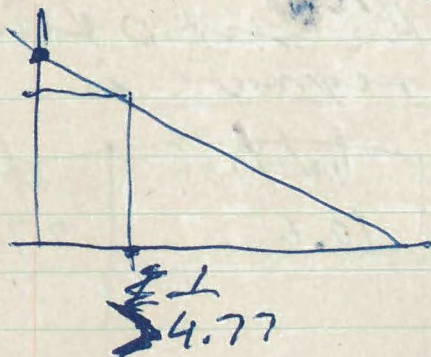
array  $\begin{cases} 398 \\ 378 \end{cases} \times 100$   

$$\frac{\quad}{\quad} = 3.9 \cdot 10^4$$

plates from 10 AM Febr 8<sup>H</sup> ( $0.3 \mu/l$ )  $\frac{1}{e}$   
 $\bar{c} = 12 \text{ hrs}$

array  $\begin{cases} 652 \\ 609 \end{cases} \times 50$   

$$\frac{1261}{2} = 630 \times 50 = 31,500$$



$3.15 \cdot 10^4$   
 $(\rho_0 = 1.5 \cdot 10^5)$   
 $[2 \cdot 10^{-15}]$   
 $\frac{1.5 \cdot 10^5}{2 \cdot 10^{-15}} = 7.5 \cdot 10^{19}$

MR - 2 plates from  
 11 AM Febr 7

array  $\begin{cases} 313 \\ 320 \end{cases} \times 2 \cdot 10^5$   

$$\frac{633}{\quad} = 6.33 \cdot 10^7$$

Difference =  $30 - 12.3 = 17.7$

Inc 50 cc into 700 cc of F + 1000 of Drosophila.  
 phone or growing up  $\frac{112}{2.25 \times 50}$  to  $\frac{3850}{700 \times 5.5}$  |  $\frac{34.4}{112}$   
 in 1st repress  $0.63 \times 50$  to  $700 \times 5$  |  $\frac{3500}{112}$   
 in 2nd repress  $31.5$  |  $\frac{3500}{112}$

fluctuations expected after repress:

assuming 30 mutants or <sup>extent</sup> mutants to be present in  $10^7$  50cc in acutium containing  $2 \times 10^7$  B<sub>1</sub> each has  $100 \times 30 = 3000$  in ~~repress~~ these grow up in the average 100 times but  $\frac{1}{10}$  of them grow 100 times the rest 0 times fluctuation of total after repress is

$\pm \frac{\sqrt{3000}}{10} \cdot 10 = 17.4 \times 10 = 174$   
 $\pm \frac{17.4}{3000} = \pm \frac{1}{17} = \pm 6\%$

but/10 <sup>7</sup>	after/10 <sup>7</sup>
10.6	27.2
16.0	31.6
10	36.0
$\frac{36.6}{3} = 12.3$	
2	24.2
	$\frac{119.0}{4} =$

In previous exp using small insects 5cc (in place of 30cc) 300 mutants ~~the~~ assuming that fluctuation factor 2 we may say that 1/10 of bugs grew up by factor 100. this would give  $\pm \frac{\sqrt{3}}{3} = \pm 50\%$

Plater from ~~Worm~~ <sup>re</sup> ~~Worm~~ Feb 10<sup>th</sup> H

(V. 3  $\mu$ /l @ = 12 hours)

array

$$\left. \begin{array}{r} 120 \times 200 \\ 105 \\ \hline 225 \end{array} \right\} = 2.25 \times 10^4$$

$\frac{1}{2} + \frac{1}{2}$  } clear regime. 11 surface out

Mo R<sub>y</sub> = 2

units

array

$$\left. \begin{array}{r} 232 \\ 227 \\ \hline 459 = 225 \end{array} \right\} \times 10^5$$

$\frac{1}{2} + \frac{1}{2}$  {  $2 \times 720 = 1440$   
later 2000/lc  $\frac{459}{2} = 225$

2.25  $10^7$

regraw exp No 5 Summary

t = 0 for 11 am Jan 27

t = 24 hrs 11 am Jan 28

bet 24 /  $2.27 \times 10^7$   
after 150 /  $5.51 \times 10^7$   
bet 28 /  $1.74 \times 10^7$   
after 144 /  $4.56 \times 10^7$

t = 96 hrs ~~Jan 30~~ 1030 AM Jan 31

bet 9 /  $0.9 \times 10^7$   
after ~~144~~ /  $4 \times 10^7$   
bet 2 /  $.63 \times 10^7$   
at 121 /  $5.10^7$

t = 144 hrs

Feb 2<sup>nd</sup>

30

Febr 12<sup>th</sup>

Twin plates from Febr 11<sup>th</sup> 10 AM

$$\begin{array}{r} \text{array} \left\{ \begin{array}{l} 117 \\ 107 \end{array} \right. \times 100 \\ \hline 224 = 112 \end{array}$$

11,200

$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 2 \\ 3 \end{array} \right.$  reinv

$T_2$  alone =  $\left\{ \begin{array}{l} 4 \\ 2 \end{array} \right.$  reinv

$T_6$  alone  $\left\{ \begin{array}{l} 5 \\ 3 \end{array} \right.$  reinv

$T_7$  alone  $\left\{ \begin{array}{l} 0 \\ \text{cont.} \end{array} \right.$  reinv

MR-2

$$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 384 \\ - \end{array} \right. \quad \text{array} \left\{ \begin{array}{l} 300 \\ 301 \end{array} \right. \times 10^5 \quad 3 \cdot 10^7$$

Twin reprocessor plates from 9:45 pm Febr 11

$$\text{array} \left\{ \begin{array}{l} 70 \\ 64 \\ \hline 134 \end{array} \right. \quad 200 \quad 13,400$$

+  $T_2 \left\{ \begin{array}{l} 0 \\ - \end{array} \right.$  9 hrs growth

and in case of latest repair exp  
with large involvement (5000)

$$\pm \frac{\sqrt{30}}{30} = \pm \frac{5.5}{30} = \pm 16\frac{1}{2} \%$$

Fluctuations in all this could  
cause price lag - period!

Monday Febr 14<sup>th</sup> / 49 Plates  
Twin grow up (27°) plates from 1 AM Febr 13

$$\left\{ \begin{array}{l} 150 \\ 144 \end{array} \right\} \times 100 = [14,700]$$

---

$$\begin{array}{r} 294 \\ \underline{147} \end{array}$$

Twin grow up (27°) plates from 1:30 pm Febr 13

$$\left\{ \begin{array}{l} 169 \\ 163 \end{array} \right\} \times 100 = [16,600]$$

---

$$\begin{array}{r} 332 \\ \underline{\quad} \\ 2 \end{array} = 166$$

Twin grow up (37°) plates from 1:30 pm Febr ~~13~~<sup>13<sup>th</sup></sup>

$$\left\{ \begin{array}{l} 193 \\ 210 \end{array} \right\} \times 200 = 40,300$$

---

$$\begin{array}{r} 403 \\ \underline{\quad} \\ 2 \end{array}$$

Twin (forming at 27°) plates 1:30 pm Febr 13<sup>th</sup>

mean

$$\left\{ \begin{array}{l} 430 \\ 416 \end{array} \right\} \times 50 = [21,000]$$

---

$$\begin{array}{r} 846 \\ \underline{\quad} \\ 2 \end{array} = 423$$

Sunday Febr 13

th

H

Plates from 11 am Febr 12

Twin assay

$$\begin{cases} 278 \\ 240 \end{cases} \times 50$$

$$\frac{518}{2} = 259 = [13000]$$

Twin repress (370)  
(from 11 am Febr 12)

$$1 + 1/2 \left\{ \begin{matrix} 0 \\ 0 \end{matrix} \right.$$

$$\begin{cases} 91 \\ \text{cont} \end{cases} \times 200 = 18200$$

~~Twin repress (shut at 27°)~~

MR-2 (11 am Febr 12)

$$\begin{cases} 299 \\ 301 \end{cases} \times 10^5$$

$$\frac{600}{2} = 300 \quad [3 \cdot 10^7]$$

Plates from 2 pm Febr 12

Twin grow up assay  
(27° shut)

$$\begin{cases} 236 \\ 264 \end{cases} \times 50$$

$$\frac{500}{2} = 250 \quad [12500]$$

Omp<sup>+</sup> grow up  
(shut at 27°C)

$$\begin{cases} 277 \\ 257 \end{cases} \times 10^5$$

$$\frac{534}{2} = [26700]$$

Train grow up (started at 37°)

$$\left\{ \begin{array}{l} 208 \\ 218 \end{array} \right\} \times 200 \quad [42600]$$
$$\frac{426}{2}$$

MR=2

$$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 202 \\ 332 \end{array} \right\} \times 10^5 \quad [3.1 \times 10^7]$$
$$\frac{624}{2} = 312$$

MR=2 (27°) grow up

$$\frac{1}{10} + T_2 \left\{ \begin{array}{l} 328 \\ 298 \end{array} \right\} \times 10^5 \quad [3.13 \times 10^7]$$
$$\frac{626}{2} = 313$$

Double MR=2 ~~by~~

$$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 0 \\ 1 \end{array} \right\} \times 2$$



MR-2 at 27°C plates from 130 pm Febr 13 H

$$\left. \begin{array}{l} 1+Tr \\ 2 \end{array} \right\} 86 \left\{ \begin{array}{l} 616 \\ 577 \\ \hline 1193 \end{array} \right. \begin{array}{l} 5 \times 10^4 \\ \\ \end{array} = 597 \left[ 3 \times 10^7 \right]$$

MR-2 grow up (at 27°C) plates from 130 pm Febr. 13

$$\left. \begin{array}{l} 1+Tr \\ 10 \end{array} \right\} 2 \left\{ \begin{array}{l} 335 \\ 349 \\ \hline 684 \end{array} \right. \begin{array}{l} \\ \\ \times 10^5 \end{array} = 334 \left[ 3.34 \times 10^7 \right]$$

did not grow up!

Tuesday Febr. 15<sup>th</sup>  
 Plates from 10 AM Febr 14<sup>th</sup>

Travis ~~100~~ (at 27°C)

$$\left. \begin{array}{l} 207 \\ 207 \\ \hline 429 \end{array} \right\} 100 = 214$$

[21400]

Travis grow up (27°C)

$$\left\{ \begin{array}{l} 168 \\ 169 \end{array} \right. \times 100 \left[ 16900 \right]$$

$$\frac{1}{10} + \bar{T}_2 \left\{ \begin{array}{l} 40 \\ 11 \\ 13 \\ 13 \end{array} \right.$$

$$1 + \bar{T}_6 \left\{ \begin{array}{l} 6 \\ 15 \end{array} \right. \\ \hline \frac{21}{2} = 10$$

$$1 + \bar{T}_7 \left\{ \begin{array}{l} 52 \\ 48 \end{array} \right.$$

Saturday Feb 18 (10 AM)

Photos from 10 AM Feb 18 (number at 37)  
~~40000~~

$$\text{array} \left\{ \begin{array}{l} 197 \\ 209 \end{array} \right. \times 50 \quad [10000]. \\ \hline \frac{406}{2} = 203$$

MR-3

$$\text{array} \left\{ \begin{array}{l} 238 \\ 225 \end{array} \right. \times 2 \cdot 10^5 \\ \hline 463 \quad \boxed{4.63 \times 10^7}$$

$$1 + \bar{T}_6 \left\{ \begin{array}{l} 14 \\ 12 \end{array} \right. \quad \left\{ \begin{array}{l} 0 \\ 1 \end{array} \right. \\ 1 + \bar{T}_7 \left\{ \begin{array}{l} 60 \\ 67 \end{array} \right.$$

MR-3/37 see

Again 12 sec. turn

Turn fluorate adjusted to 3 min  
at 3 pm

Wednesday Febr 16

W

Tween plates 10<sup>30</sup> AM Febr 15

~~array~~  $\left. \begin{array}{l} 0 \\ \frac{1}{10} + T_2 \end{array} \right\} \text{cont.}$

$$\begin{array}{r} \text{array} \left\{ \begin{array}{l} 238 \\ 206 \end{array} \right. \times 50 \\ \hline 444 \\ \underline{\quad} \\ 2 \end{array} = 222$$

[14,100]

Febr. 17 Thursday

Tween (at 37) running

Plates from  
10 AM Febr. 16

$$\begin{array}{r} \left\{ \begin{array}{l} 2154 \\ 154 \end{array} \right. \times 50 \\ \hline 308 \\ \underline{\quad} \\ 2 \end{array} = 154 \quad 50$$

[7700]

Febr 18 Friday

Tween array

10 AM Febr 17

$$\frac{1}{10} + T_2 \left\{ \begin{array}{l} 4 \\ 1 \end{array} \right.$$

$$\left\{ \begin{array}{l} 212 \\ 201 \end{array} \right. \times 50$$

$$\frac{413}{2} = 206 \times 50$$

[10,000]

MR-3

from 10 AM Febr 17

array  $\left\{ \begin{array}{l} 303 \\ 301 \end{array} \right. \times 10^5$

[3 x 10<sup>5</sup>]

10 cc of bacteria + 3 cc of T7  
 were centrifuged and decanted to 0.1 cc

---


$$\frac{7 \text{ per square}}{4} \quad \frac{100 \frac{8}{13.5} \cdot 2 \cdot 10^7}{36} = \frac{100}{36} = 2.78 \cdot 10^7$$

$$\frac{112}{52} = 2.15 \cdot 10^7$$


---

$$2 \frac{100}{100} \frac{8}{11} \cdot 2 \cdot 10^7 = \frac{100}{11} \frac{3}{100} \cdot 10^7$$

lyses exp. 7cc culture + 3cc T7

4 in 4 squares

culture

H

7

12

11

$$\frac{34}{4} = 8/4 \text{ sq.}$$

$$8 \times 5 \cdot 10^6 = [4 \times 10^7]$$

$$\begin{array}{r} 7.5 \text{ to } 23 \frac{1}{2} \\ \underline{15.5} \\ 13.5 \end{array}$$

5  
6 } protot start 4:45 pm

$$\begin{array}{r} 6 \\ \underline{26} \\ 4 \end{array} \left. \vphantom{\begin{array}{r} 6 \\ \underline{26} \\ 4 \end{array}} \right\} 6/4 \text{ sq} = [3 \cdot 10^7]$$

prot at great after 30 min in bottle  
from inspection  
found and 3rd inspected at 5 pm

$$\begin{array}{r} 4 \\ 4 \\ 3 \\ 6 \end{array} \left. \vphantom{\begin{array}{r} 4 \\ 4 \\ 3 \\ 6 \end{array}} \right\} \begin{array}{r} 7.5 \quad 17.5 \\ \underline{10} \end{array} [4]$$

30 min tubes

$$\begin{array}{r} 1 \\ 1 \\ 3 \\ \underline{5} \end{array} \left. \vphantom{\begin{array}{r} 1 \\ 1 \\ 3 \\ \underline{5} \end{array}} \right\} \begin{array}{r} 3 \\ 0 \\ \underline{13} \\ 6 \end{array} = [2] \quad \left. \vphantom{\begin{array}{r} 3 \\ 0 \\ \underline{13} \\ 6 \end{array}} \right\} \begin{array}{r} 0 \text{ to } 11 \\ 11 \end{array}$$

Monday Feb 21

Plates from 11 AM Feb 20

MA-3

$$\text{avg} \left\{ \begin{array}{l} 313 \\ 280 \times 210^5 \\ \hline 593 \end{array} \right. \quad [6 \cdot 10^7]$$

$$1 + T_6 \left\{ \begin{array}{l} 21 \\ 17 \end{array} \right.$$

$$1 + T_7 \left\{ \begin{array}{l} 24 \\ 24 \end{array} \right.$$

reinc.  $\frac{1}{2} + T_2 \left\{ \begin{array}{l} 1 \\ 2 \end{array} \right.$

~~etc~~

Trim  
avg  $\left\{ \begin{array}{l} 215 \text{ at room temp.} \\ 182 \times 100 \\ \hline 397 \\ 2 \end{array} \right. \quad [20,000]$   
 $\frac{397}{2} = 198$

9:45 am must set rate 3 min 50 sec  
3 min 50 sec.

~~rate~~ rate set at:

Sunday Febr 20

H

Twin (in ~~room~~<sup>lab</sup>) plates from 1 AM  
no ice array  $\left\{ \begin{array}{l} 165 \\ 161 \end{array} \right. \times 100$  Febr 19

iced (1hr)

$$\text{array} \left\{ \begin{array}{l} 153 \\ 145 \end{array} \right. \times 100$$
$$\frac{298}{2} = 149$$

[16300]

plates from 11:30 AM  
Febr 19

[15000]

MR-3 plates from 3 pm Febr 19

iced (1.5hr)

$$\left\{ \begin{array}{l} 250 \\ 267 \end{array} \right. 2 \cdot 10^5$$
$$\frac{517}{2} \quad [5.17 \cdot 10^7]$$

MR-3  
(rounded)

plates from 11:30 AM Febr 19

$$\text{array} \left\{ \begin{array}{l} 286 \\ 299 \end{array} \right. \times 2 \cdot 10^5$$
$$\frac{585}{2} \quad [5.8 \cdot 10^7]$$

$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 4 \\ 5 \end{array} \right.$   
reine

$1 + T_6 \left\{ \begin{array}{l} 20 \\ 19 \end{array} \right.$

$1 + T_7 \left\{ \begin{array}{l} 76 \\ 95 \end{array} \right.$   
reine  
2 slaps

at 11:30 AM Twin runs at 3m 38 sec  
3m 47 sec  
reset at 2m 58 sec

# X-ray exp No 1

Neph before 60 at ~~200~~ 200 pm

Neph after 80 on Nro/irrad for 2 min)  
at 250 pm

50 cc from I transferred to No II flask (50 cc  
at 2<sup>25</sup> pm and incubated F)

from No I 9 cc + 1 cc T<sub>7</sub> incubated at 2<sup>45</sup>

No I shows du neph at 3<sup>25</sup> 60 div

No II shows in neph at 4<sup>45</sup> 54

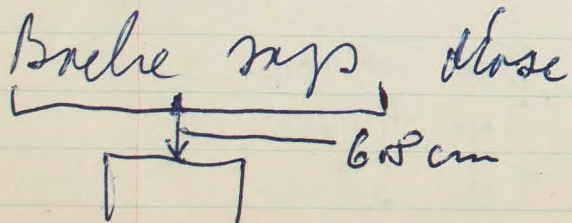
No III " " " at 5<sup>55</sup> 54 stand 33  
+ 10% = 60 div

No IV " " " at 7<sup>00</sup> 40 div.

No V incubate for lysis as 7<sup>15</sup> pm

Dead No IV and V at 2<sup>45</sup> pm

(Plate 34)



678 / min

648 / min on edge



Tuesday Feb. 22

H

Plates from 10 AM Feb 21

Twin  
copy

$$\begin{array}{r} \left\{ \begin{array}{l} 205 \\ 189 \end{array} \right\} \times 100 \\ \hline 394 \\ \hline 2 = 197 \end{array}$$

$$\text{revic } \frac{1}{2} + T_2 \left\{ \begin{array}{l} 2 \\ 1 \end{array} \right.$$

[20,000]

MR-3

$$\left\{ \begin{array}{l} 261 \\ 265 \end{array} \right\} \\ \hline 526$$

$$2 \cdot 10^5$$

[5.26  $10^7$ ]

$T_6$  alone  $\left\{ \begin{array}{l} 1 \\ 1 \end{array} \right.$   $1 + T_6 \left\{ \begin{array}{l} 12 \\ 13 \end{array} \right.$  (~~Handwritten scribbles~~)

revic  $1 + T_7 \left\{ \begin{array}{l} 60 \\ 54 \end{array} \right.$

$$\frac{1}{2} + T_2 \left\{ \begin{array}{l} 0 \\ \text{count} \end{array} \right.$$

[ $T_7$  alone o.k.]

[ $T_2$  alone o.k.]

0  
0  
0  
1

15 to 2.5 = 7.5

No 3 centrifuged down to 0.3 cc  
[conc. factor 33] at 610 nm

9  
8  
9  
5  
3  
3

6 per square

$$\begin{array}{r}
 6 \times 4 \times 2 \times 10^7 \\
 \hline
 30 \times 3 \times 7 \\
 = 4 \times 10^7 \\
 0.6 \times 10^7
 \end{array}$$

26 down

24 down

37/6

Control centrifuging No 2 we lost about  
1/2 reading 40 re diluted and observed

1 per square  
est.

13 down

No 4 centrifuged down to 0.1 cc : factor 90

4  
3  
4  
3  
3  
0

$$\begin{array}{l}
 \frac{17}{6} = 3 \text{ / square} \\
 \frac{1}{90} \times 3 \times \frac{8}{9} \times 8 \times 2 \times 10^7 \\
 = \frac{1}{2} \times 10^7
 \end{array}$$

~~118~~ ~~103~~

$$\begin{array}{l}
 18 \times 9 = 11 \\
 18.5 \times 6 = 7 \quad \} 9
 \end{array}$$

Count from No I at 305 pm  
21 div

7  
7  
12  
6

[Narrow  $6.5 \cdot 10^7$ ]  
19 div

$6.5 \cdot 10^7$  (x 5/06)  
 $32.5 \cdot 10^6$

$\frac{8.8}{20} \cdot 2 \cdot 10^7$   
 $= 6.4 \cdot 10^7$  cells

Load 5200  
or 0.53  
micrograms

$\frac{32}{4}$   
6  
7  
5

17.5 div

~~12.5 to 12.5~~

$\frac{22.5}{8.5}$   
14

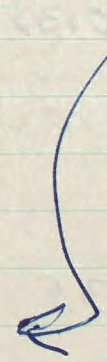
Counts from No ~~II~~ Lyrate (not centrif.)  
at 405 pm [1 hr 20 min incubation]

0  
1  

---

0  
0  
0  
0

16.0 to 10 = 14  
17 hr  $\phi = 11$



No 2 centrifuged down from 9+1 cc  
to 0.8 cc (concentration factor 11)  
incub for lysos 5 hrs + 5 count +  
observed at 5 pm:

No 5 Lyrahe (next morning) Suber  
 branched lux  
 cent. drawn to 0.2 cc

6 downward

1  
 1  
 1  
 1  
 0  
 1  
 0  
 2  
 1  
 2  
 2  
 2  
 1  
 1  
 3  
 2  
 1  
 1  
 2  
 0

$1.2 \times \frac{4}{45} = 0.11$  / square  
 or about  $0.11$  / square  
 for camp with  $8$  / sq.  
 diluted  $\frac{8}{16} = 0.5$  / square  
 or about  $\frac{1}{2} \cdot [0.25 / \text{square}]$  5 downward

~~$0.11$  / square  
 is  $\frac{8}{5} \cdot 2 \cdot 10^7 \cdot 0.11$   
 $= 0.35 \cdot 10^7$~~

$\frac{1.2}{45} \times \frac{8}{5} \cdot 2 \cdot 10^7 \times 16$   
 $= \frac{16 \times 16}{5 \times 45} \cdot 1.2 \cdot 10^7$   
 $= \frac{255}{225} = 1.35 \cdot 10^7$

5 downward

$\frac{25}{5} = \frac{5}{4} = 1.2$  per square for 5 downward

Wednesday Feb 23 real

Plates from Feb 22 10 AM

Prin (at 37)

revise  $\frac{1}{2} + \bar{T}_2 \left\{ \begin{array}{l} 2 \\ 2 \end{array} \right.$

~~array~~ array  $\left\{ \begin{array}{l} 187 \\ 143 \end{array} \right. \times 10^5$

$$\frac{330}{2} = 165$$

$[16,500]$

MR-3

array  $\left\{ \begin{array}{l} 172 \\ 208 \end{array} \right. \times 2 \cdot 10^5$

$1 + \bar{T}_6 \left\{ \begin{array}{l} 5 \\ 12 \end{array} \right.$

$$\frac{380}{1} = 380 \quad [3.8 \cdot 10^7]$$

revise  $\frac{1}{2} + \bar{T}_2 \left\{ \begin{array}{l} 80 \\ \text{rounded} \end{array} \right.$

$[$  Mephitom  $4 \times 10^7$   
at 10 AM Feb 23  $]$

$1 + \bar{T}_7$  not rounded

X-ray experiment

Plates from 225 pm, Feb 22

No 1

Base  $678 \text{ r/min}$   
in center  
 $648 \text{ r/min}$   
on edge

$$\left\{ \begin{array}{l} 224 \\ 242 \end{array} \right. \times 10^5 \quad [2.3 \cdot 10^7]$$
$$\frac{466}{2} = 233$$

total Prin



X-ray exp count.

W

before irradi. at 2 pm Febr 22

$$\text{Depth} = 60 \left\{ \begin{array}{l} 110 \\ 125 \end{array} \right. \times 10^5 \quad \left[ 4.7 \cdot 10^7 \right]$$

$$\hline 235$$

No 2 at 325 pm (Febr 22)

$$\left[ \text{Hmg } 5.3 \cdot 10^7 \right] \left\{ \begin{array}{l} 71 \\ 81 \end{array} \right. \times 10^5$$

$$\hline 152 \quad \left[ 1.5 \cdot 10^7 \right]$$

No 3 at 440 pm (Febr 22)

$$\left[ \text{Hmg } 4.0 \cdot 10^7 \right] \left\{ \begin{array}{l} 77 \\ 76 \end{array} \right. \times 10^5$$

$$\hline 153 \quad \left[ 1.53 \cdot 10^7 \right]$$

No 4 at 550 pm

$$\left[ \text{Hmg } 4.0 \cdot 10^7 \right] \left\{ \begin{array}{l} 125 \\ 135 \end{array} \right. \times 10^5$$

$$\hline 260 \quad \left[ 2.6 \cdot 10^7 \right]$$

plate from 105 pm Febr 22

Nepokela - test

T. Bendring 37 mm

No 5

$$\left[ \text{Hmg } 3.6 \cdot 10^7 \right]$$

$$\left\{ \begin{array}{l} 253 \\ 250 \end{array} \right. \times 10^5 \quad \left[ 2.5 \cdot 10^7 \right]$$

$$\left\{ \begin{array}{l} 122 \\ 147 \end{array} \right. \times 10^5 \quad \left[ 2.7 \cdot 10^7 \right]$$

$$\hline 269$$

Sunday Febr 27

Trwin from 2 pm Febr 26

$$\begin{cases} 53 \\ 70 \end{cases} \times 50$$

$$\frac{123}{2} = 61$$

$$2[3000]$$

MR4 11 AM Febr 28

$$1/2 T_7 \begin{cases} 173 \\ 170 \end{cases}$$

$$\frac{170 + 173}{2} = 172/cc$$

$$1/2 T_6 \begin{cases} 12 \\ 13 \end{cases}$$

$$\frac{12 + 13}{2} = 12.5$$

Saturday Mar 5th / 49

Plates from Mar 3rd

Trwin:

$$\begin{cases} 25 \\ 33 \end{cases} \times 50$$

$$\frac{58}{2} = 29 = [1500]$$

examining at  
12 to 15 hrs  
with N.D. ~~examined~~  
arrived

T<sub>2</sub> alone f<sub>0</sub>

MR-4

T<sub>2</sub> alone f<sub>0</sub>

$$\text{array} \begin{cases} 325 \\ 312 \end{cases} \times 10^5$$

$$\frac{325 + 312}{2} = 637$$

$$[6.37 \cdot 10^7]$$

$$1/2 + T_7 \begin{cases} 84 \\ 106 \end{cases}$$

$$\frac{84 + 106}{2} = 190/cc$$

$$1/2 + T_2 \begin{cases} 2 \\ 1 \end{cases}$$

$$1/2 + T_6 \begin{cases} 10 \end{cases}$$

$$20/cc$$



Thursday Febr 24

H

Plates from Febr 23 11 AM

Twin

$$\left\{ \begin{array}{r} 109 \\ 100 \\ \hline 104 \end{array} \right\} \times 50 \quad [5000]$$

MR-3

$$\left\{ \begin{array}{r} 363 \\ 362 \end{array} \right\} \times 10^5 \quad [3.6 \times 10^7]$$

(N. at 215  
 5.3  $10^7$   
 overnight  
 it was overexposed)

$$\left\{ \begin{array}{r} 13 \\ 10 \end{array} \right\} \times 10^6$$

$$\text{series } \frac{1}{2} \times 10^2 \left\{ \begin{array}{r} 362 \\ \text{not counted} \end{array} \right.$$

Saturday Febr 26

Plates from 2:30 pm Febr 25

Twin

$$\left\{ \begin{array}{r} 73 \\ 63 \\ \hline 136 \\ \hline 2 \end{array} \right\} \times 50 \quad [3400]$$

MR 3

$$\left\{ 472 \right\} \times 10^5 \quad [4.7 \times 10^5]$$

Count of N<sub>2</sub>O at 295 μm

10 square of ocular  $\sigma = 14$

6  
12  
7  
9  
8

$$\frac{52}{6} = 8.7$$

after refocusing

12  
14  
6  
8  
8

$$\frac{30.5}{60 \text{ cent.}} = \frac{1}{2} 10^7$$

this would be  
10% dead for  $5 \times 10^7$

$$\sigma = 12$$

$$\sigma = 12$$

$$\frac{48}{5} = 9.6$$

$$\text{After} = \frac{9 \times 2.55 \times 2 \times 2 \times 10^7}{2 \times 3 \times 30.5 \times 10^7}$$

enteroacidian 3.2  $d = 2$  chamber of

chamber reading = 2.55 ocular reading

$$\left[ \text{After} \right] \left[ \text{oc. reading} \right] \times 2.55 \frac{\sigma}{\sigma}$$

$$\times 2 \times 10^7$$

Sunday ~~10/11/49~~ Mar 6/49  
 MR-4 Plates from Mar 5<sup>th</sup>

M

avg  $\left\{ \begin{array}{l} 436 \\ 400 \end{array} \right. \times 10^5$

$$\frac{836}{2} = 418 \quad [4.2 \times 10^7]$$

II red

~~(Mars 5<sup>th</sup>)~~

X ray exp 40 min at 8 cur

0 at 11 AM

Neph  $49 \times \frac{34}{27} = [61.7]$

Standard 27/(34)

At 12<sup>20</sup> pm

Neph ~~49~~  $65 \times \frac{34}{27} = [82]$

Stand: 27/(34)

No 1 incub at 12<sup>30</sup>

0 after  
 played  
 at 12<sup>25</sup> pm

No No (0) 7.5 cc + 1 cc T<sub>7</sub> in cube. 5 min  
 centrifuged to 0.15 cc in cube. at 12<sup>45</sup>

~~at 12<sup>30</sup> pm~~ No 1 at 2<sup>30</sup> pm

Neph 33.5

Standard ~~27~~ 27/34

No 2 at 5<sup>15</sup> pm  
Depth = 26  
Stand 26 / (34)

---

No 1 Lyrate at 8 pm / (incentubed since 4<sup>00</sup> pm)

Is

$$f = 9$$

6  
8  
3  
3  
4  
2  
5  
3  
6  
6  
2  
4  
7  
3  
3  
6

$$\overline{80/n} = 4.8$$

(10 min by

No 1 sample 10 cc centrifuged down  
to 1 cc and so 10 cc " was plated with  
plugs T<sub>1</sub>, T<sub>2</sub>, T<sub>6</sub>, T<sub>7</sub> at 3 pm [plate marked 230]  
[no incubation with plugs!]  
or for

at 3:35 pm Neg 33 (unincubated)  
Standard ~~24~~ 25 / (34)  
No 2 inoculated at 3:40 pm  
100 cc T + 85 cc B<sub>2</sub> from No 1

---

No 1 10 cc + 1 cc T<sub>7</sub> at 3:45 pm incub  
centrifuged to 0.12 cc for 5 min  
incubated at 4:00 pm

---

No 2 at 4:45 pm  
Neg 2 = 36 ×  $\frac{34}{27}$  =  
Standard ~~24~~ 27 / (34)

No 2 plated for 5 min with  
 $\frac{1}{2}$  cc + 0.2 T<sub>1</sub> or T<sub>2</sub>, or T<sub>6</sub> or T<sub>7</sub>

---

also centrifuged 1:10  
arrays made

Mar 29/49  
Plates from Mar 28<sup>th</sup>

array  $\left\{ \begin{array}{l} 155 \\ 150 \end{array} \right. \times 10^6 \quad [1.5 \times 10^8]$

50 cm  
A distance of 50 cm V.V.  
~~5~~

Light alone: array  $\left\{ \begin{array}{l} 146 \\ 152 \end{array} \right. \times 10^6$   
+ light  
Hy + 2A boxes  $\left\{ \begin{array}{l} 120 \\ 145 \end{array} \right. \times 10^6$   
no change

2 min V.V.  
 $\frac{4}{1.5} \times 10^{-3}$   
 $\left\{ \begin{array}{l} 135 \\ 125 \end{array} \right. \times 310^3$   
 $\frac{260}{2} = 130 \sim [4 \times 10^5]$

3.5 min V.V.  
 $\frac{2}{1.5} \times 10^{-6}$   
 $\left\{ \begin{array}{l} 23 \\ 15 \end{array} \right. \times 10$   
 $\frac{38}{2} = 19 [200]$

no light reached between  $\times 10^4$   
plates. — —

Country deducos

V V Exp H

~~9546~~

8551

4613

62

4 squares on a circular

porce about 254 latched

Mar 28<sup>th</sup> / 49

VV Experiment (fundamental) H  
plating on old plates from Mar 23<sup>rd</sup>

Plumb tube reads 63.75

"

" 37.00 with 2 A  
at 14.3 cm from stand  
~~to~~ to stand

or 18.1 from edge of the  
glass lamp to front of plumb  
cell

center to center from lamp  
to test tube for visible 19 cm  
read 15 min

(100 cc. was irradiated in  
old cell / chamber 14 cm)

Exp started  
VV continuous read. 1 cm hole  
Photocell on top of grid read

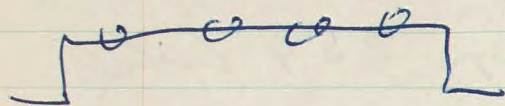


Photo F 1/4 45 min<sup>+</sup>  
in F.

Control covered  
with Al pane

1:3 distributed in dishes [9+4.5]  
photocell reads 9.8 without colla  
pane

---

2.5 cm read

photocell reads 62

20 cm in each dish

Solder on left hand F on right hand  
side of shaker side of shaker

Photocell 59 ~~59~~ Center Photocell 54 ~~54~~

Photocell 62.5

[collipane also in this setup  
cuts from 62 to 50; no collipane  
used however]

Online was in online 2 hours



Mar 29

H

Light read 30 min with Projector  
50cc suspension in 14 cm diameter  
per dish read with U.V.

Mar 30<sup>th</sup> plates from yesterday

~~3.5 m U.V~~

array

3.5 m U.V

$$\left\{ \begin{array}{l} 169 \\ 178 \end{array} \right. \times 10^6$$
$$\left\{ \begin{array}{l} 0 \\ 1 \end{array} \right. \times 10$$

3.5 m U.V

+ 30 min

Projector

$$\left\{ \begin{array}{l} 205 \\ 174 \end{array} \right. \times 10^3$$

[ reactivation to  $\frac{1}{1000}$  of array ]

3.5 m U.V

+ 30 min

daylight  
cold

$$\left\{ \begin{array}{l} 58 \\ 64 \times 3 \end{array} \right. 10^3$$

Continuous exp of yesterday  
array of Dish

(inf)

$$\left\{ \begin{array}{l} 216 \\ 236 \end{array} \right. \quad 310^5$$

---

$$\frac{452}{2} = 226 \quad [7 \times 10^7]$$

Control  
growth  
in test  
1h 45m

$$\left\{ \begin{array}{l} 92 \\ 76 \end{array} \right. \quad \times 310^6$$

---

$$\frac{168}{2} = 84 \quad [2.5 \times 10^8]$$

increased by 3.7

1h 45m

$$\left\{ \begin{array}{l} \text{same} \\ \text{or zero} \end{array} \right. \quad \times 10^5$$

~~Drop~~

drop

~~by factor of maybe 700~~

by factor of maybe 700 ?

---

Samples in box have overexposed  
and ~~more~~ more hours of light of sun  
this morning. — Penhill, incubated at  $6.7 \times 10^6$   
11:20 AM. — result  $[5.4 \times 10^7]$  ins  $\left\{ \begin{array}{l} 197 \\ 161 \end{array} \right. \times 310^5$  inf  $\left\{ \begin{array}{l} 36 \\ 31 \end{array} \right. \times 10^5$   
 $\frac{358}{2} = 179$   $\frac{67}{}$

Mon 31st/49

2.5 min UV from yesterday:

H

in F

$$\left. \begin{array}{l} \text{array} \\ \text{array} \end{array} \right\} \begin{array}{l} 197 \\ 241 \\ \hline 438 = 220 \end{array}$$

$$[2.2 \cdot 10^3]$$

2.5 min U.V.

$$\left. \begin{array}{l} \text{in F} \\ \text{array} \end{array} \right\} \begin{array}{l} 126 \times 10 \\ \text{array} \end{array}$$

$$[1.3 \cdot 10^3]$$

30 min P light

$$\left\{ \begin{array}{l} 114 \\ \times 10^4 \end{array} \right.$$

$$[1.2 \cdot 10^6]$$

60 min P light

$$\left\{ \begin{array}{l} 82 \\ \times 10^5 \end{array} \right.$$

$$[8 \cdot 10^6]$$

in buline

$$\left. \begin{array}{l} \text{array} \\ \text{array} \end{array} \right\} \begin{array}{l} 142 \\ 135 \\ \hline 277 = 138 \end{array} \times 10^6$$

$$[1.4 \cdot 10^3]$$

2.5 min U.V.

$$\left. \begin{array}{l} \text{array} \\ \text{array} \end{array} \right\} \begin{array}{l} 132 \\ \times 100 \\ \text{array} \end{array}$$

$$[1.3 \cdot 10^4]$$

30 min P light

$$\left\{ \begin{array}{l} 90 \\ \times 10^5 \end{array} \right.$$

$$[9 \cdot 10^6]$$

60 min P light

$$\left\{ \begin{array}{l} 440 \\ \times 10^5 \end{array} \right.$$

$$[4.4 \cdot 10^7]$$

Apr 1st - 49

add(1) Plates from yesterday

array  
~~to 1st part~~

$$\left\{ \begin{array}{l} 174 \\ 190 \\ \hline 364/2 = 182 \end{array} \right. \times 10^6$$

$$\boxed{1.8 \times 10^8}$$

30 sec UV

$$\left\{ \begin{array}{l} 394 \\ 400 \\ \hline 794 = 397 \sim 400 \end{array} \right. \times 3 \times 10^5$$

$$\boxed{1.02 \times 10^8}$$

add(3) Plates from yesterday

array in S

$$\left\{ \begin{array}{l} 127 \\ 132 \\ \hline 259 = 129 \end{array} \right. \times 10^6$$

$$\boxed{1.3 \times 10^8}$$

array in F

$$\left\{ \begin{array}{l} 119 \\ 132 \\ \hline 241 = 120 \end{array} \right. \times 10^6$$

$$\boxed{1.2 \times 10^8}$$

2.5 UV in S  
(6 hrs in balance)

1 mentaned  
2.5 mV in S

$$\left\{ \begin{array}{l} 487 \\ 453 \\ \hline 950/2 = 475 \end{array} \right. \times 100$$

$$\boxed{4.75 \times 10^4}$$

2700

at 2:30 PM  
balances  
look normally  
from

2.5 mV about 50 kinds  
in F. more imbedded  
at 2.5 mV in F.

$$\left\{ \begin{array}{l} 93 \\ 93 \\ \hline \end{array} \right. \times 10 \quad \boxed{9.3 \times 10^2}$$

$$\boxed{1.3 \times 10^5}$$

Mar 31<sup>st</sup> / 48

- 1.) Gap short with F [1/2 cc gave 47 numbers with T<sub>1</sub>  
1/2 cc gave 48 numbers with T<sub>2</sub>]

Traced for 30 sec (at 60 div)

to knock down to a  $\sim 10^8$  suspension of b/r (20 cc); this will be diluted

1 to 10 after traced and grown back

to  $\sim 10^8$  (by probor 30) incubated at 240 pm till ~~at~~ 6 pm away made after <sup>(Friday morning)</sup> tracing

- 2.) Assay made on b/r in saline (also b/r in F) and exposure to light is started to determine killing by light. — Light 2:50 pm to 6:00 pm

- 3.) To compare inactivation in F and saline, F re-incubated at 3 pm 2.5 min V.V. [at photocell 61] to 4 pm

~~30 sec~~  $10^4$   $10^8$

on light effect on mutants **LM**

Exp short : yesterday's 2.5 min UV in S

exposed to light from 11 AM to 12<sup>55</sup> noon  
assay made and incubated at noon  
with 4 roots at F added,  
solids kept in dark. Also incubated at noon  
with 4 roots of F added [in dark AL but  
covered]

platings ~~now~~ to be made at 3<sup>15</sup> and every  
hour after that assay, +Ti, +Tih

at 5<sup>30</sup> forgot to incubate 6<sup>15</sup> into see last  
page 2m (Saturday) ~~and~~ incubated at 9<sup>30</sup>  
platings short at 10<sup>30</sup> ~~AM~~

UV. Series at 6 pm Photocell 61

im F assay  $\left\{ \begin{array}{l} 149 \\ 152 \end{array} \right. \times 10^6 \quad [1.5 \cdot 10^8]$

1/2 min U.V  $\left\{ \begin{array}{l} 64 \\ 65 \end{array} \right. \times 10^6 \quad [6.5 \cdot 10^7]$

1 min U.V  $\left\{ \begin{array}{l} 111 \\ 120 \end{array} \right. \times 10^5 \quad [1.15 \cdot 10^7]$

air

Killing by light exp.

H

3 hrs 10 min of light

array (upside) in S

$$\left\{ \begin{array}{l} 114 \\ 109 \end{array} \right\} \times 10^6$$

$$\frac{223}{2} = 111 \quad [1.1 \times 10^8]$$

after 3h 10m PL. in S

$$\left\{ \begin{array}{l} 343 \\ 311 \end{array} \right\} 3 \times 10^5$$

$$\frac{654}{2} = 327 \quad [1 \times 10^8]$$

no killing in S

after 3h 10m PL. in F

$$\left\{ \begin{array}{l} 519 \\ 304 \end{array} \right\} 3 \times 10^5$$

array in F was  $[1.8 \times 10^8]$

gives no growth and some decrease

Sat. Apr. 2nd

" First leg of exp

1 min 10 sec U V's given to 6 samples of rock of various B/r int. ~~incubated~~ in a bag flask and draw off rock every hour for 6 hours. assayed. all the same time. — first sample drawn at 105 last sample at 6:55 then do 6 samples by back 6 and

Photo cell reads 60 divisions

LM assay of 55 min leg at

$$\text{in } S \text{ assay } \left\{ \begin{array}{l} 270 \\ 298 \end{array} \times 3 \times 10^5 \right.$$
$$\frac{568}{2} = 284$$

$$8.5 \times 10^7$$

65% of original assay

3:15 pm flats [UV 2:15 min had out available by paper 2700]

$$L \text{ assay } \left\{ 56 \times 10^6 \right.$$

$$D \text{ assay } \left\{ \begin{array}{l} 14 \\ \blacksquare \end{array} \times 10^3 \right.$$

$$L \left( \frac{1}{2} + T_1 \right) \left\{ 68 \right. \left. \left[ 136 \right] \right.$$

cc 100/10<sup>8</sup>

$$D \left( \frac{1}{2} + T_1 \right) \left\{ 0 \right.$$

[1.440 full 4:23 610<sup>3</sup>



$$1.5 \text{ min} \left\{ \begin{array}{l} \cancel{134} \\ 192 \end{array} \right. \quad \begin{array}{l} 3 \cdot 10^3 \\ \hline 15.8 \cdot 10^5 \end{array} \quad H$$

~~Volume of gas at 1.5 min~~  
~~at 1.5 min~~

$$2 \text{ min} \left\{ \begin{array}{l} 32 \\ 36 \end{array} \right. \quad 3 \cdot 10^2 \quad [1 \cdot 10^4]$$

$$2 \frac{1}{2} \text{ min} \left\{ \begin{array}{l} 23 \\ 21 \end{array} \right. \quad \times 10 \quad [2.2 \cdot 10^2]$$

$$\frac{24000}{104} \quad 1.4$$

$$\text{or } 3.4 / \text{cc}$$

$$\text{or } 13.6 \text{ per } 4 \text{ cc}$$

Sunday Apr 3rd

LM

Plates from 1 pm yesterday

$$D \text{ array} \left\{ \begin{array}{l} 1372 \times 2 \\ \times 10^3 \end{array} \right. \quad \left[ \begin{array}{l} 2.85 \times 10^6 \\ 200 \times 10^4 \end{array} \right]$$

$$D \left( \frac{1}{2} \text{cc} + T_1 \right) \left\{ 500 \times 2 = [1000] \right.$$

$$L \text{ array} \left\{ \begin{array}{l} 1188 \\ \times 10^6 \end{array} \right. \quad \begin{array}{l} \cancel{12} \times 10^8 \\ 12 \times 10^8 \end{array}$$

$$L \left( 0.1 \text{cc} + T_1 \right) \left\{ \begin{array}{l} 2600 \\ \times 10 \end{array} \right. = \begin{array}{l} \cancel{26000} \\ 26000 \end{array}$$

very crowded plate

~~Plates from 1030 AM~~

plates from 1030 AM

$$D \text{ array} \left\{ \begin{array}{l} 322 \\ \times 10^3 \end{array} \right. \quad \left[ \begin{array}{l} 32 \times 10^4 \\ \underline{\underline{3.2 \times 10^5}} \end{array} \right]$$

$$D \left( \frac{1}{2} \text{cc} + T_1 \right) \left\{ 17 \times 2 \quad [34] \right.$$

$$L \text{ array} \left\{ \begin{array}{l} 274 \\ \times 10^6 \end{array} \right. \quad \left[ 2.7 \times 10^8 \right]$$

$$L \left( 0.1 + T_1 \right) \left\{ \begin{array}{l} 170 \\ \times 10 \end{array} \right. \quad [1700]$$

LM  $4^{15}$   $\mu$  plates

H

$$\text{array } L \left\{ \begin{array}{l} 146 \\ \times 10^6 \end{array} \right. \quad D \left\{ \begin{array}{l} 33 \\ \times 10^3 \end{array} \right.$$

$$L \left( \frac{1}{2} \text{cc} + T_1 \right) \left\{ \begin{array}{l} 202 \\ \end{array} \right. \quad D \left( \frac{1}{2} \text{cc} + T_1 \right) \left\{ \begin{array}{l} 0 \\ \end{array} \right.$$

530  $\mu$

$$L \text{ array} \left\{ \begin{array}{l} 204 \\ \times 10^6 \end{array} \right. \quad D \text{ array} \left\{ \begin{array}{l} 78 \\ \times 10^3 \end{array} \right.$$

$$L \left( \frac{1}{2} \text{cc} + T_1 \right) \left\{ \begin{array}{l} 593 \\ \end{array} \right. \quad D \left( \frac{1}{2} \text{cc} + T_1 \right) \left\{ \begin{array}{l} 1 \\ \end{array} \right.$$

---

UV Series in Saline  
started at 5  $\mu$ m Phobocell 60  
in Saline over 24 hrs. —

---

~~LM~~

# LM Table

Light

Dark				Light			S.	L
12 noon	M/cc	Multip	Net. $7 \cdot 10^7$	M	Multip	M/K	M/K	
3 <sup>15</sup> pm <del>14</del> $10^4$	0	1.4	5.6 "	136	3.3	0	41	
4 <sup>15</sup> pm 3.3 "	0	3.3	15 "	404	8.8	0	46	
5 <sup>30</sup> pm 7.8 "	0	7.8	28 "	1180	16.5	0	71.5	
10 <sup>30</sup> AM 32 "	34	32	27 "	1700	16	1	106	
11 <sup>30</sup> AM 71 "	150	71	52 "	4700	30	2	154	
1 <sup>00</sup> pm 285 "	1000	285	120 "	26,000	70	3.5	370	
Re enumerated at 10 AM Apr. 4 <sup>th</sup>								
11 AM $502 \times 10^4$	1200	502	15,18	57000	88	2.4	650	
1 <sup>15</sup> PM $1100 \times 10^4$	2500	1100	7.10 <sup>9</sup>	350,000	412	2.54	850	
2 <sup>15</sup> PM $2000 \times 10^4$	5500	2000	2.10 <sup>10</sup>	900,000	1175	2.74	840	

$$\frac{5500}{2 \cdot 10^7} = \frac{55000}{2} \cdot 10^{-8} = 2.5 \cdot 10^4 / 10^8$$

$$\frac{9 \cdot 10^5}{2 \cdot 10^{10}} = 4.5 \cdot 10^{-5} / 10^5$$

UV.      factor 5 lower      UV4 light

U.V. Waves in Saline (24 hrs)

array

$$\left\{ \begin{array}{l} 209 \\ 237 \\ \hline 446 = 223 \end{array} \right. \times 10^6 \quad [2.2 \cdot 10^8]$$

5.5  
2.5  
4  
(12)

1/2 min

$$\left\{ \begin{array}{l} 124 \\ 158 \\ \hline 282 = 141 \end{array} \right. \times 10^6 \quad [1.4 \times 10^8]$$

1 min

$$\left\{ \begin{array}{l} 1056 \\ 945 \\ \hline 2001 \end{array} \right. \times 10^5 \quad [10^8]$$

Plakes from 1130 AM

D assay

$$\left\{ \begin{array}{l} 714 \\ \times 10^3 \end{array} \right. \quad \text{H} \quad [714 \times 10^4]$$

$$D \left( \frac{1}{2} + \bar{1}_1 \right) \left\{ \begin{array}{l} 74 \times 2 \\ \end{array} \right. \quad [150]$$

$$L \text{ assay} \left\{ \begin{array}{l} 518 \\ \times 10^6 \end{array} \right. \quad \text{H} \quad [5.2 \times 10^8]$$

$$L \left( 0.1 \mu + \bar{1}_1 \right) \left\{ \begin{array}{l} 470 \\ \times 10 \end{array} \right. \quad [4700]$$

First leg" plakes from Apr 2 (Sat)

assay 12 noon

$$\left\{ \begin{array}{l} 94 \\ 116 \\ \hline 210 \\ \hline \frac{210}{2} = 105 \end{array} \right. \quad 3 \times 10^5 \quad [3 \times 10^7]$$

1m 10 sec UV

analyzed 1:6

$$\left( \frac{5 \times 10^6}{30} = 2.5 \times 10^5 \right)$$

$$\left\{ \begin{array}{l} 25 \\ 28 \\ \hline 54 \\ \hline \frac{54}{2} = 27 \end{array} \right. \quad \times 3 \times 10^3 = \quad [8 \times 10^4]$$

When went down

Microarrays:

uncultured  
30 hrs  $\left\{ \begin{array}{l} 153 \\ 161 \end{array} \right. \times 3 \times 10^5$   
 $\frac{214}{2} = 207$   $[6 \times 10^7]$

T. brevis  
30 hrs  $\left\{ \begin{array}{l} 124 \\ 149 \end{array} \right. \times 3 \times 10^5$   
 $\frac{273}{2} = 137$   $[4 \times 10^7]$

multicentric  
30 hrs  $\left\{ \begin{array}{l} 83 \\ 86 \end{array} \right. \times 10^6$   
see later also  $\frac{179}{2} = 90$   $[9 \times 10^7]$

Apr 4<sup>th</sup> Mesopore B17 in  $\sqrt{3}$  min U.V.  
at Meadowall 59.

Light (PL) started 12<sup>10</sup> pm covered an  
for 3 hrs in lab.

LM  
Apr 5<sup>th</sup> (Tuesday)  
yesterday's plate  
1 hour growth additional growth  
(AM) D array  $\left\{ \begin{array}{l} 251 \\ 115 \end{array} \right. \times 2 \times 10^4$   $[5 \times 10^6]$   
D + T1  $\left\{ \begin{array}{l} 115 \\ 115 \end{array} \right. \times 10$   $[1150]$

$$1\frac{1}{2} \text{ min} \left\{ \begin{array}{l} 1040 \\ 1008 \\ \hline 2048 \end{array} \right. 3 \cdot 10^4 \left[ 3 \cdot 10^7 \right]_{\text{total}}$$

$$\frac{2048}{2} = 1024$$

luciferase  
50

$$2 \text{ min} \left\{ \begin{array}{l} 836 \\ \hline \end{array} \right. 3 \cdot 10^3 \left[ 2.5 \cdot 10^6 \right]$$

$$2\frac{1}{2} \text{ min} \left\{ \begin{array}{l} 185 \\ 179 \\ \hline 364 \\ \hline \end{array} \right. 3 \cdot 10^2 \left[ 5.5 \cdot 10^4 \right]$$

$$\frac{364}{2} = 182$$

$$3 \text{ min} \left\{ \begin{array}{l} 23 \\ 17 \\ \hline 40 \\ \hline \end{array} \right. \times 10 \left[ 1 \cdot 10^3 \right]$$

$$\frac{40}{2} = 20$$

$$3\frac{1}{2} \text{ min} \left\{ \begin{array}{l} 35 \\ 19 \\ \hline 54 \\ \hline \end{array} \right. \times 10 \left[ 2.7 \cdot 10^2 \right]$$

$$\frac{54}{2} = 27$$

$$3\frac{1}{2} \text{ min} \left\{ \begin{array}{l} 21 \\ 20 \\ \hline \end{array} \right. \times 10$$

$$+ 1 \text{ min flight} \left\{ \begin{array}{l} \hline 20 \end{array} \right.$$

no light reactivation seen  
in one minute







FEDERAL SECURITY AGENCY  
U. S. PUBLIC HEALTH SERVICE

IN REPLYING, ADDRESS THE

Tbc. Research Laboratory,  
411 E. 69th St., New York 21, N. Y.

December 14, 1948.

Dr. Leo Szilard,  
University of Chicago,  
Institute of Radiobiology & Biophysics,  
Chicago 37, Illinois.

Dear Dr. Szilard:

Having answered your later letter, I now find that the earlier one of November 23rd got buried under a mass of unanswered correspondence. On the matter of the effect of the influence of salt concentration on the death rate of coli, the following were our general findings: Streptomycin is very sensitive to salt concentration, the bactericidal <sup>control</sup> ~~sensitivity~~ being reduced by a factor of over 100 if the ordinary salts in the medium (around 1%) are reduced to the bare minimum of 1/1000 M phosphate. I presume, since both this minimum of phosphate and glucose are necessary for effective bactericidal action, that the trace of phosphate participates in glycolysis. To our surprise, control tubes without streptomycin began showing appreciable killing when the salt concentration got this low and glucose was present. In the presence of an ordinary amount of salt such as 1/10 normal sodium chloride or potassium chloride, at least 50% of the organisms survived 24 hours at 37°C, whereas in the low salt concentration the survival would fall below 5%. In distilled water, on the other hand, the organisms survived just as well as in saline. I had intended to pursue this matter further and write it up in some detail, but have found the mutant problems much more intriguing.

With best wishes,

Sincerely yours,

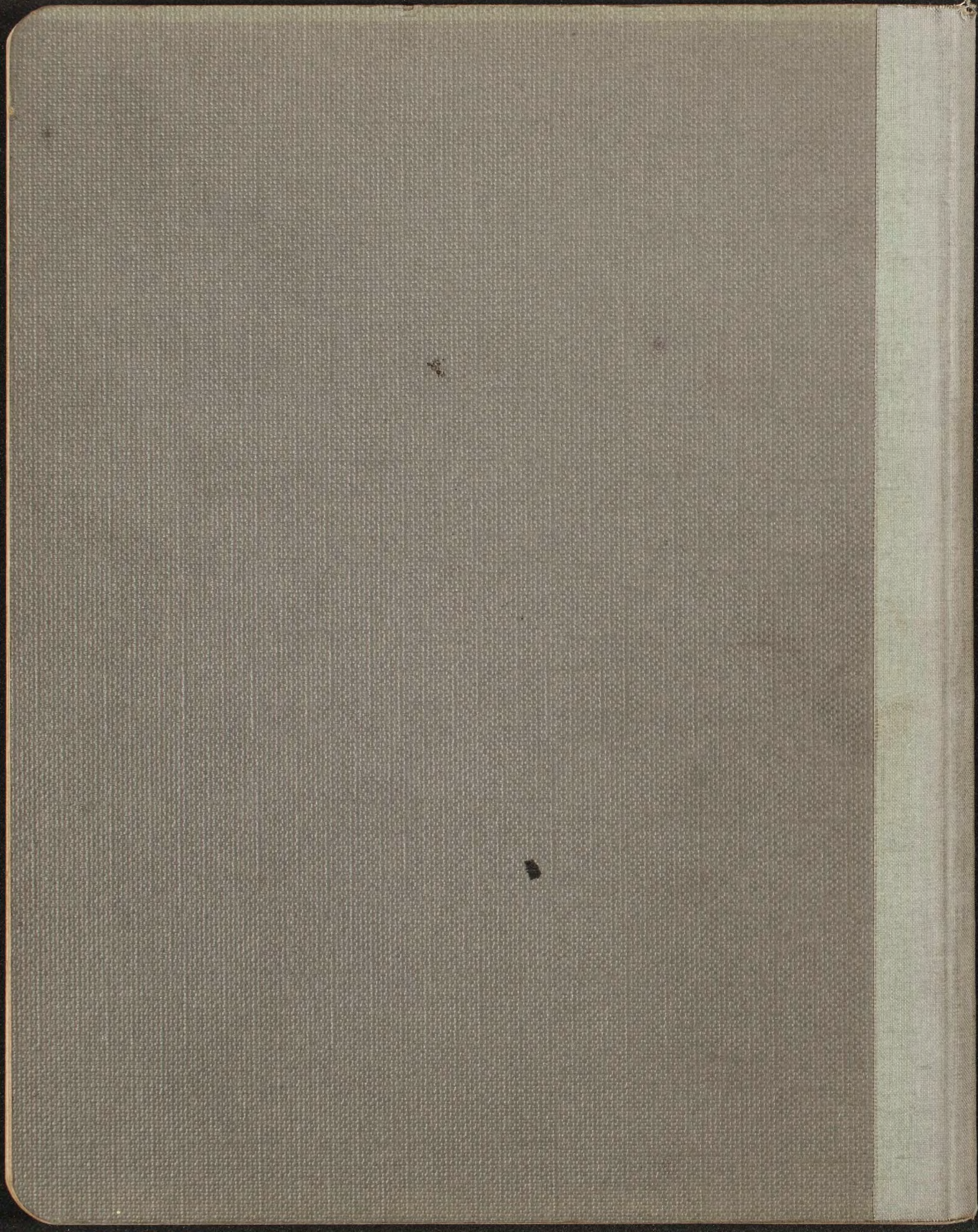
Bernard D. Davis,  
Surgeon.

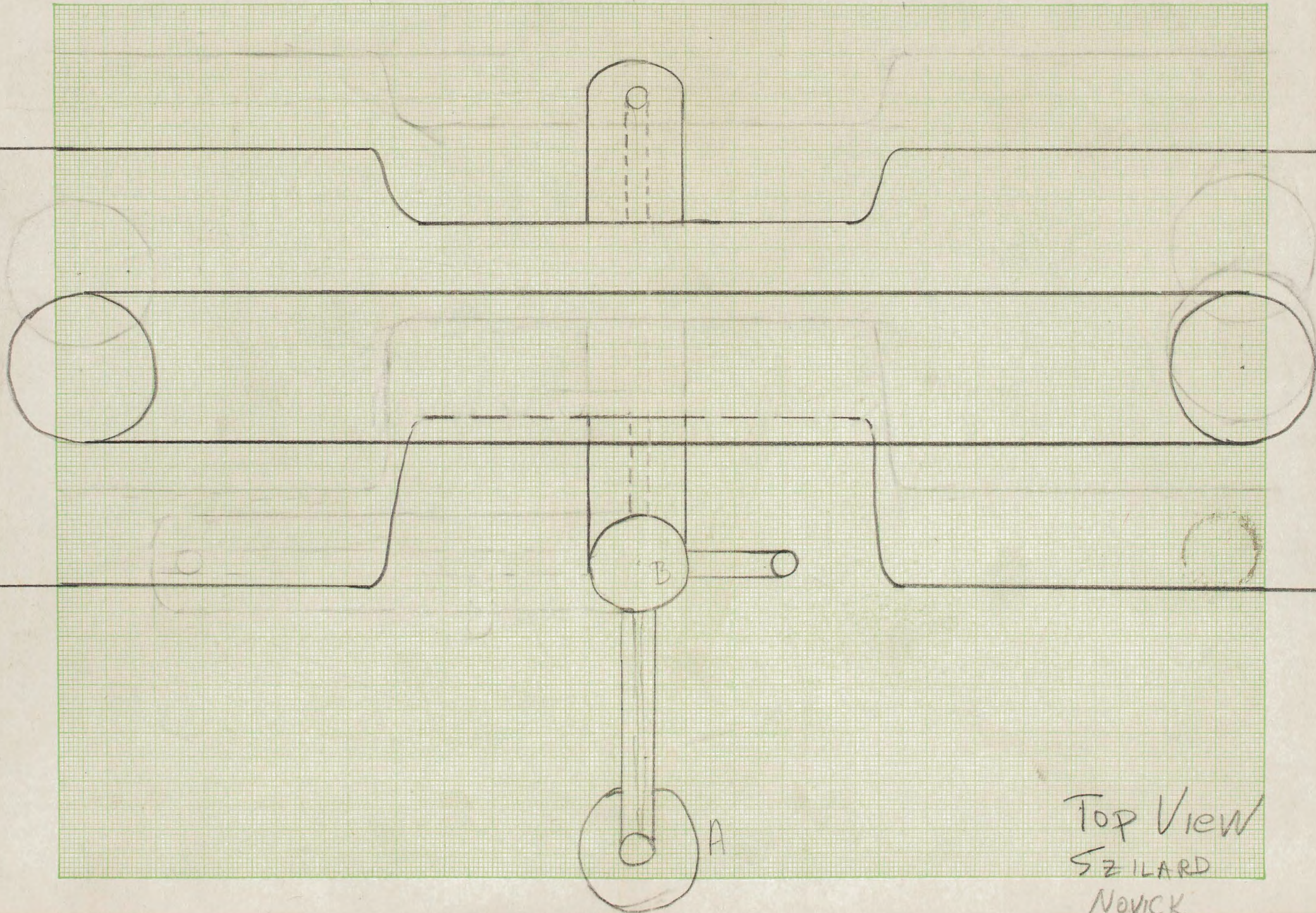
Comparison Nucleic Acids  
Hyden Cold Spring Canyon 1946  
Humber 1947

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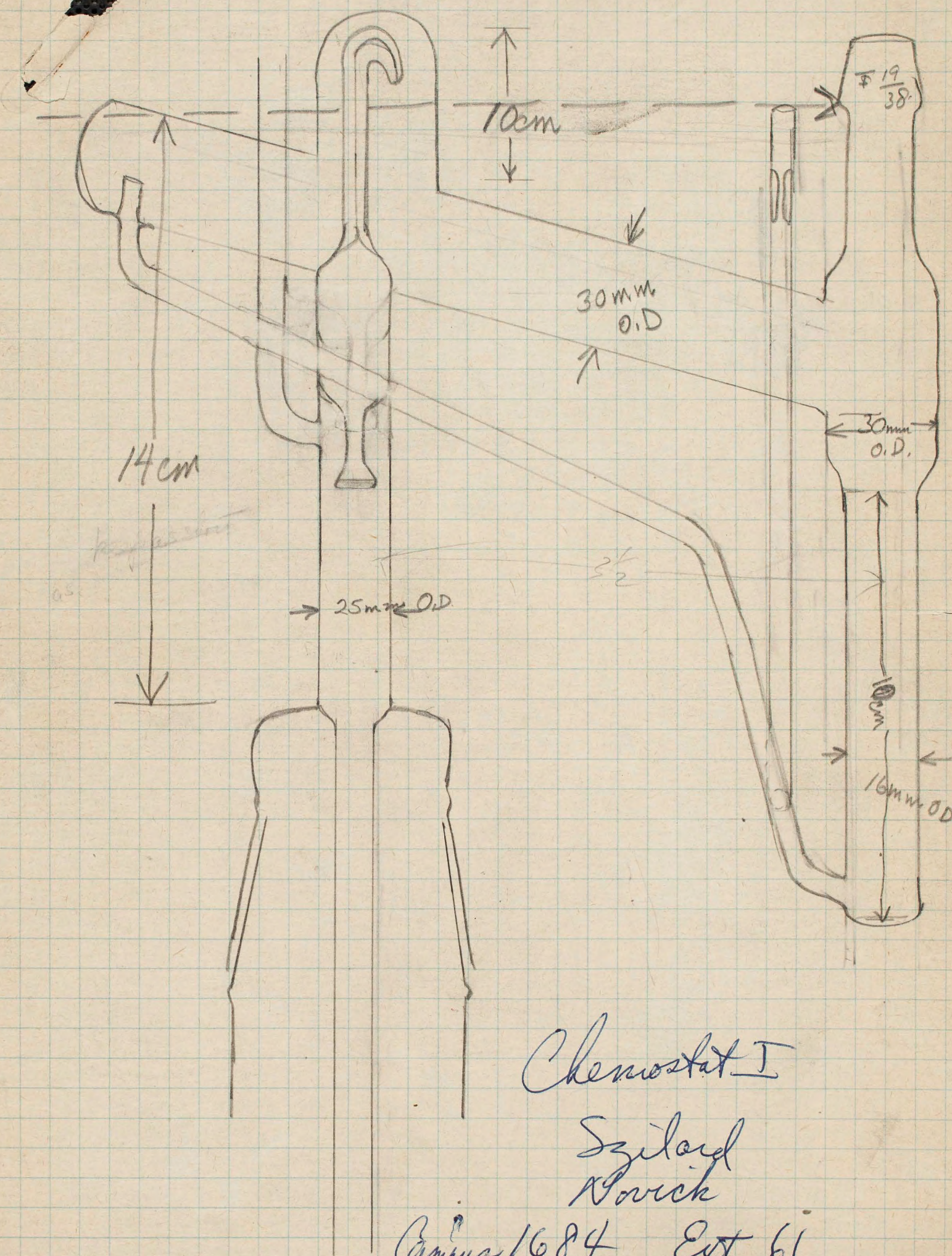
Ultra-structure of  
microorganisms. =

565 m  
1 P. m. m





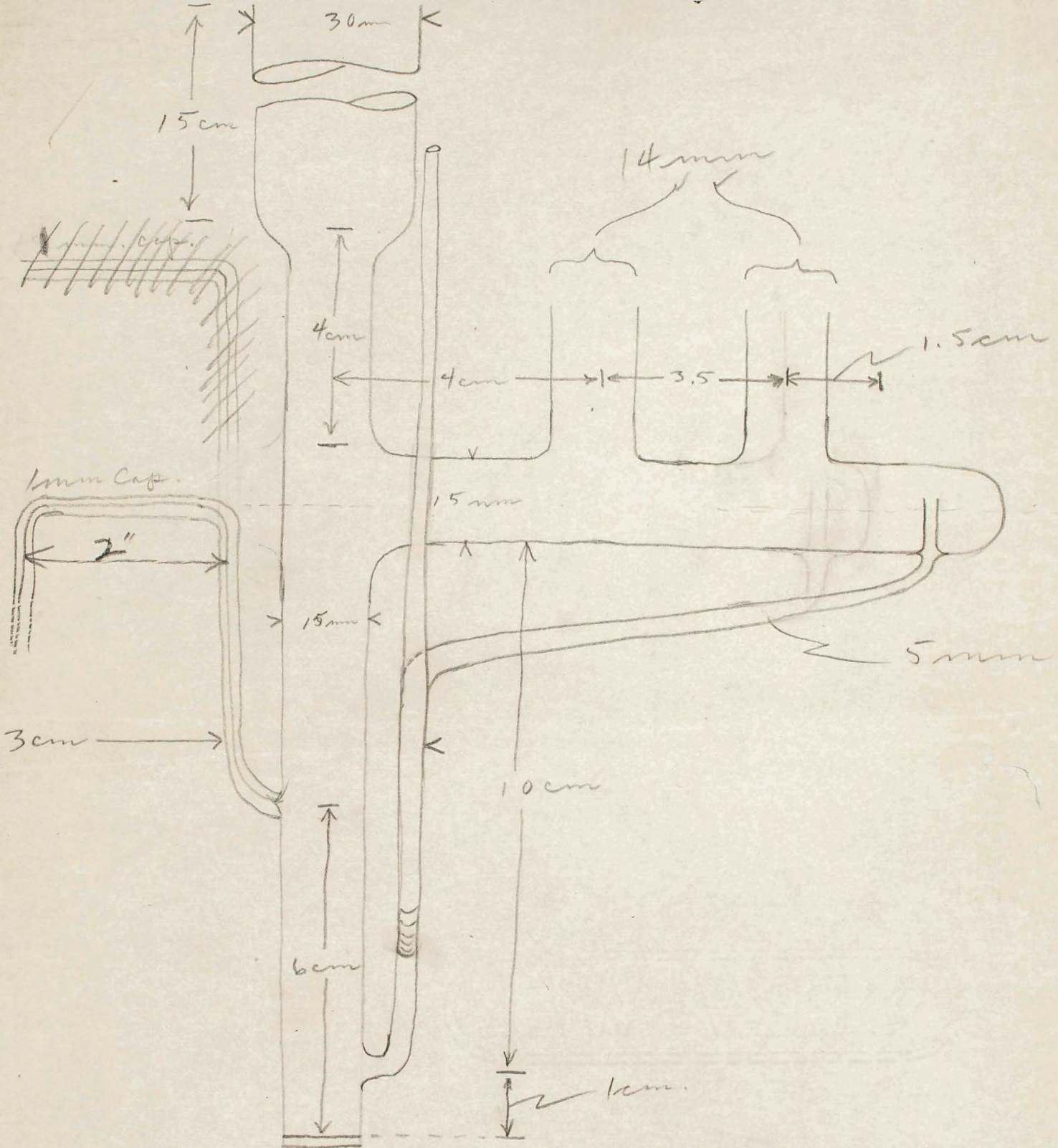
Top View  
SZILARD  
NOVICK

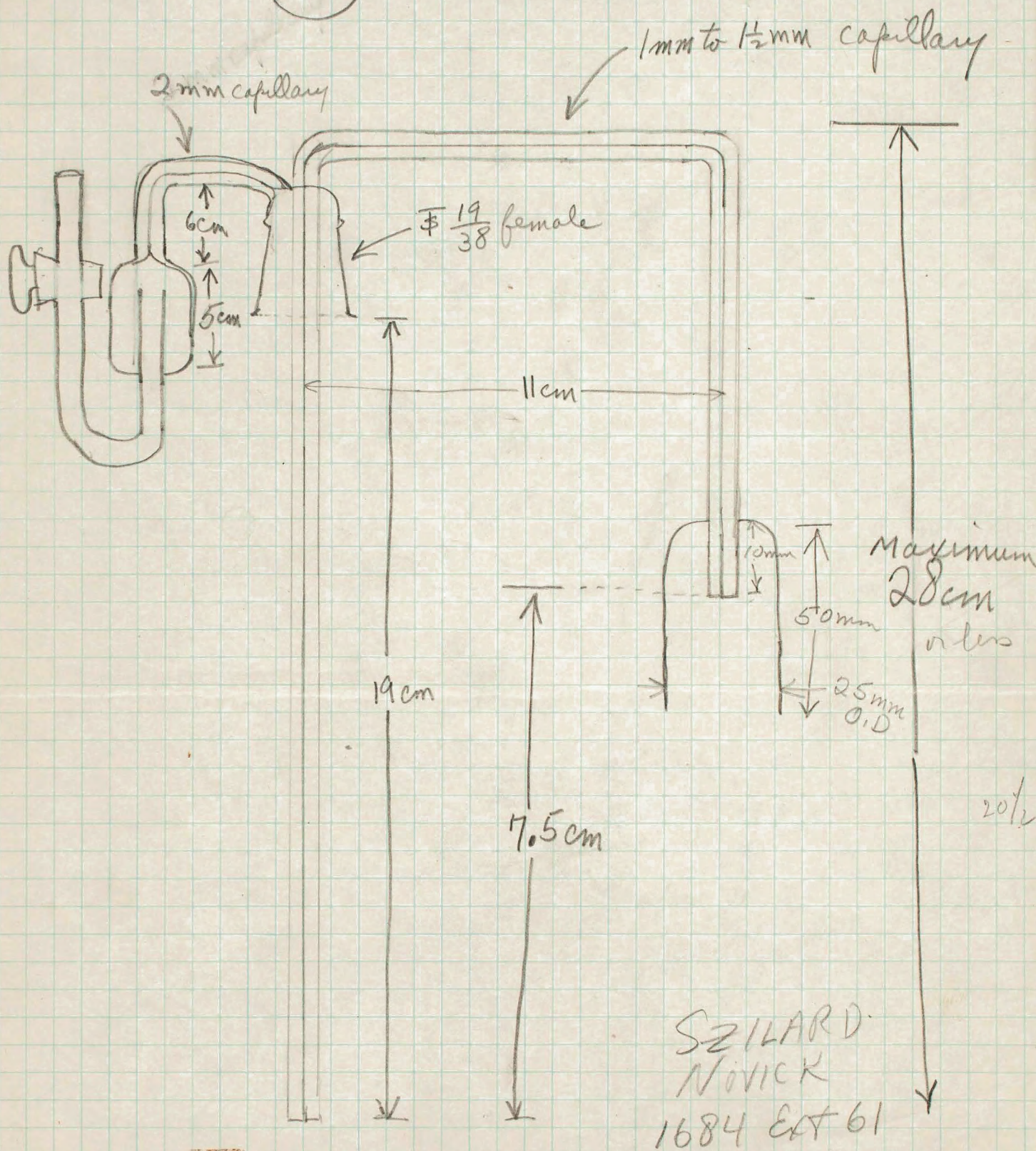
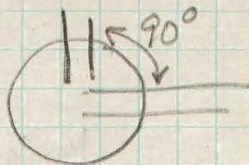


Chemostat I

Szilard  
 Norwich

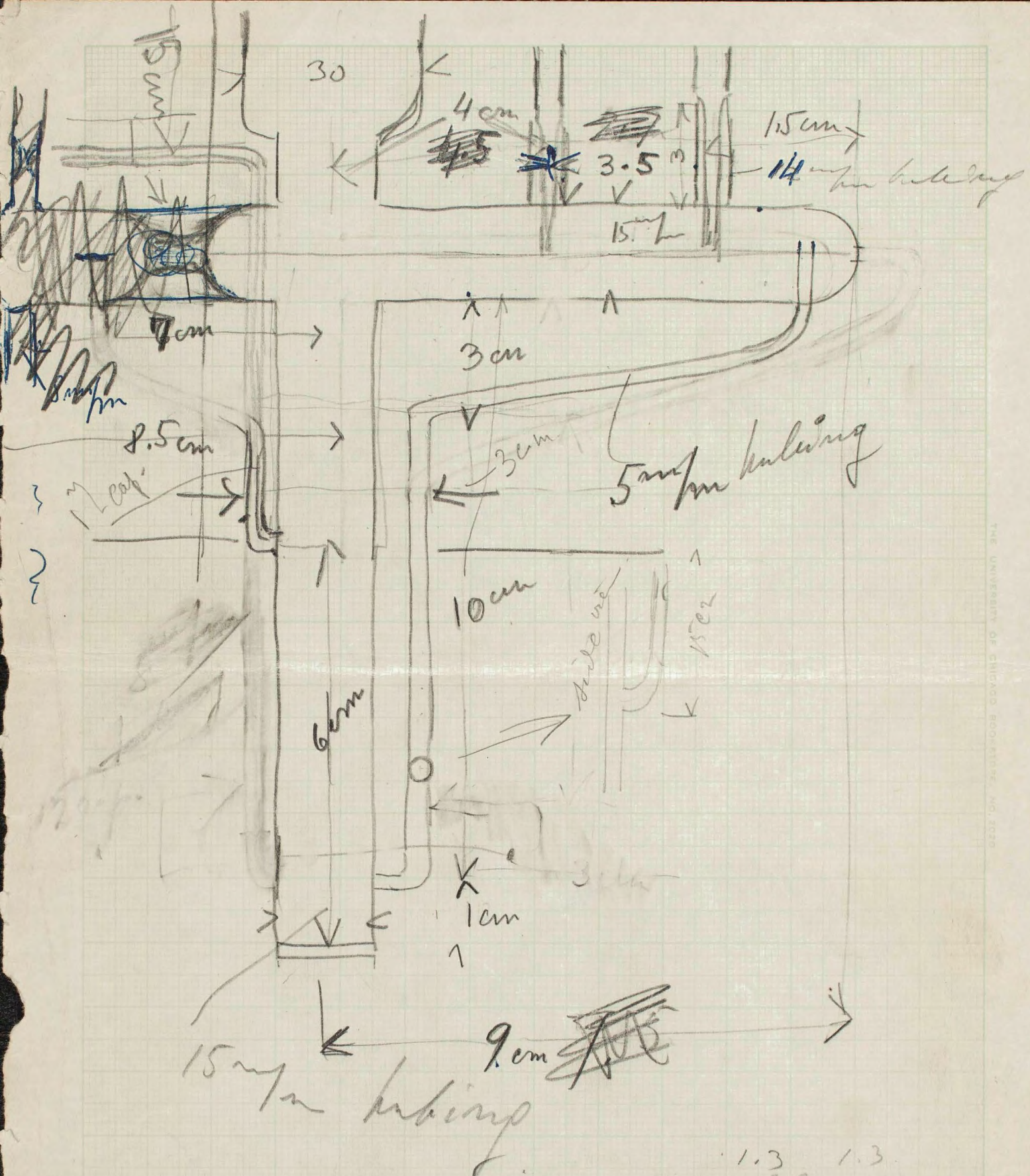
Campus 1684 Ext 61





SZILARD  
 NOVICK  
 1684 EXT 61





Novich

P.T.O.

1.3 1.3

39

1.7

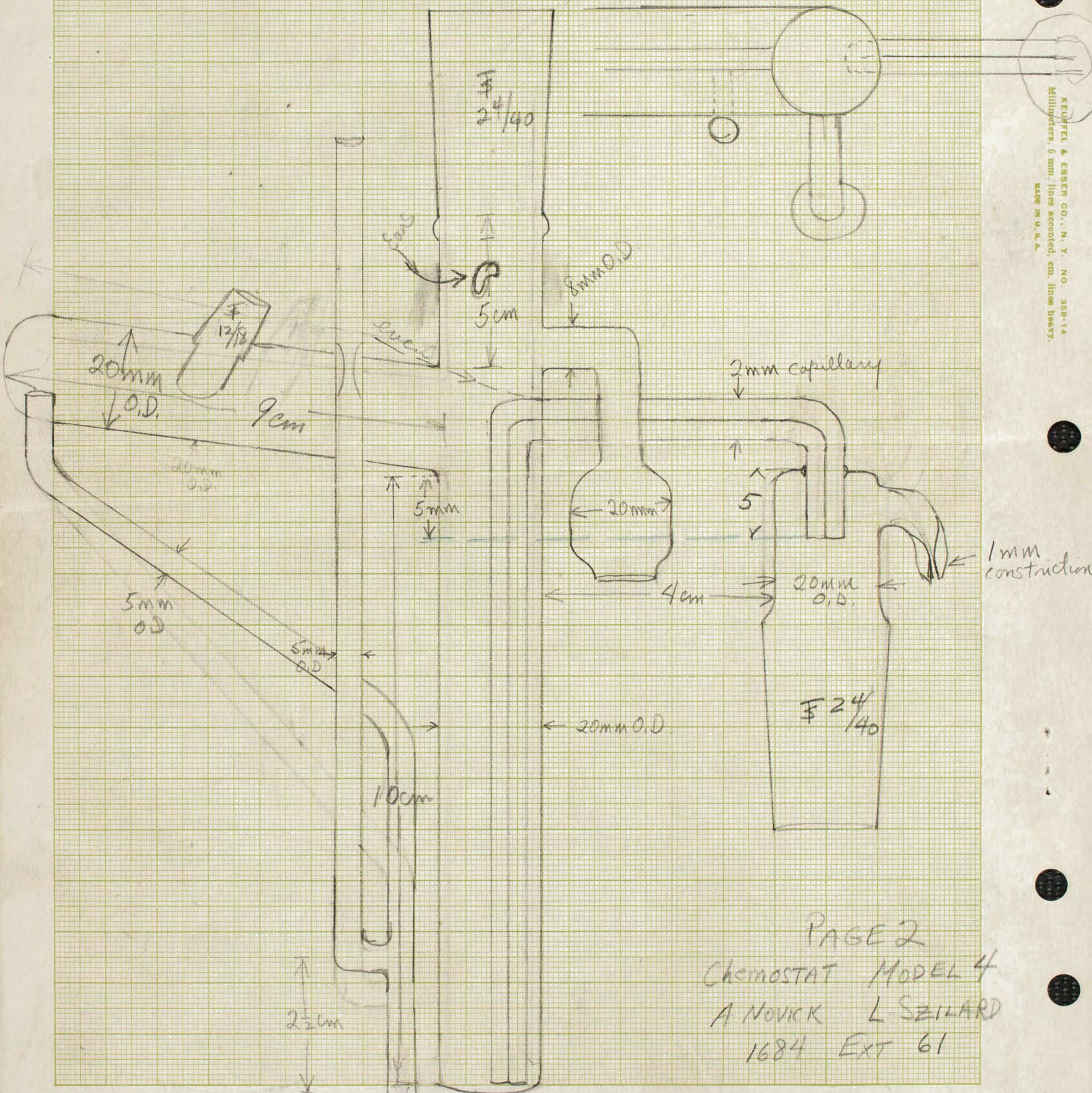
1.2 cm<sup>2</sup>

12

16 cm

||

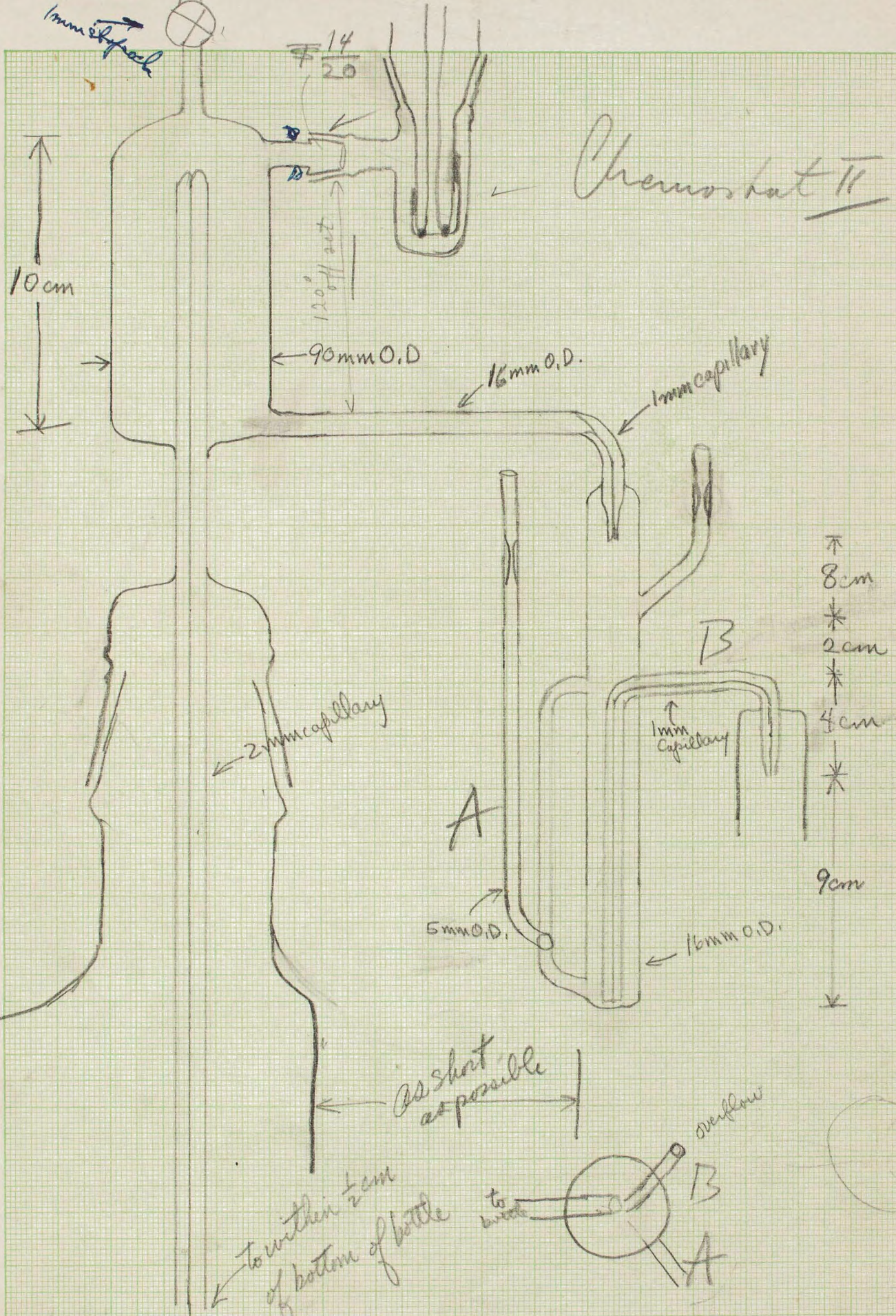
TOP VIEW



PAGE 2  
CHEMOSTAT MODEL 4  
A NOVICK L SZILARD  
1684 EXT 61

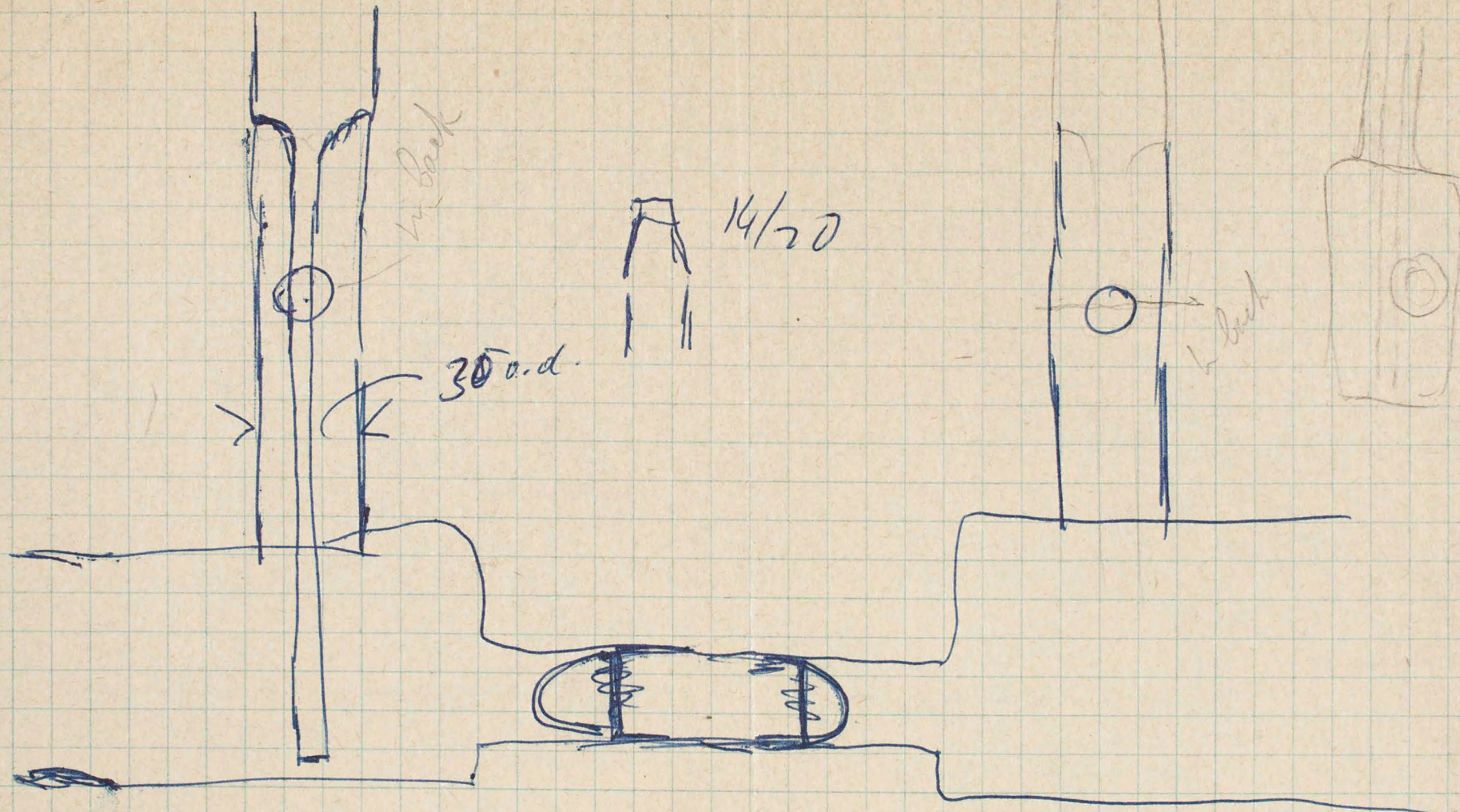
KEUFEL & ESSER CO., N. Y. NO. 388-14  
Millimeter, 6 mm, lines spaced, cm, line heavy.  
MADE IN U. S. A.

Form No. 996-10 Millimeters to Centimeter  
AMERICAN PAPER & PAPER CO., HOLYOKE, MASS.



SZILARD  
NOVICK

Campus 1684, Ext 61



1/4 back

14/20

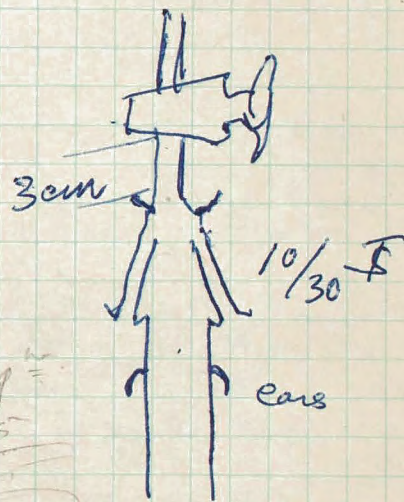
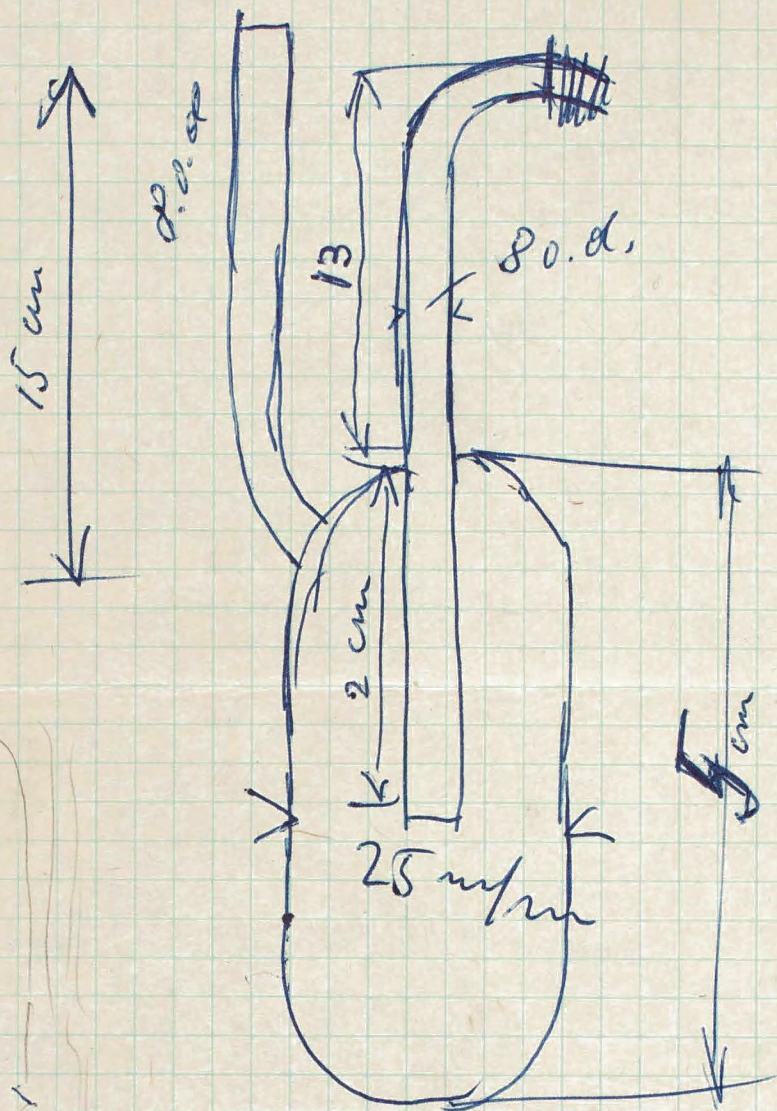
30 o.d.

1/4 back

2423 P

Chromobot I

pin and bit  
growth hole

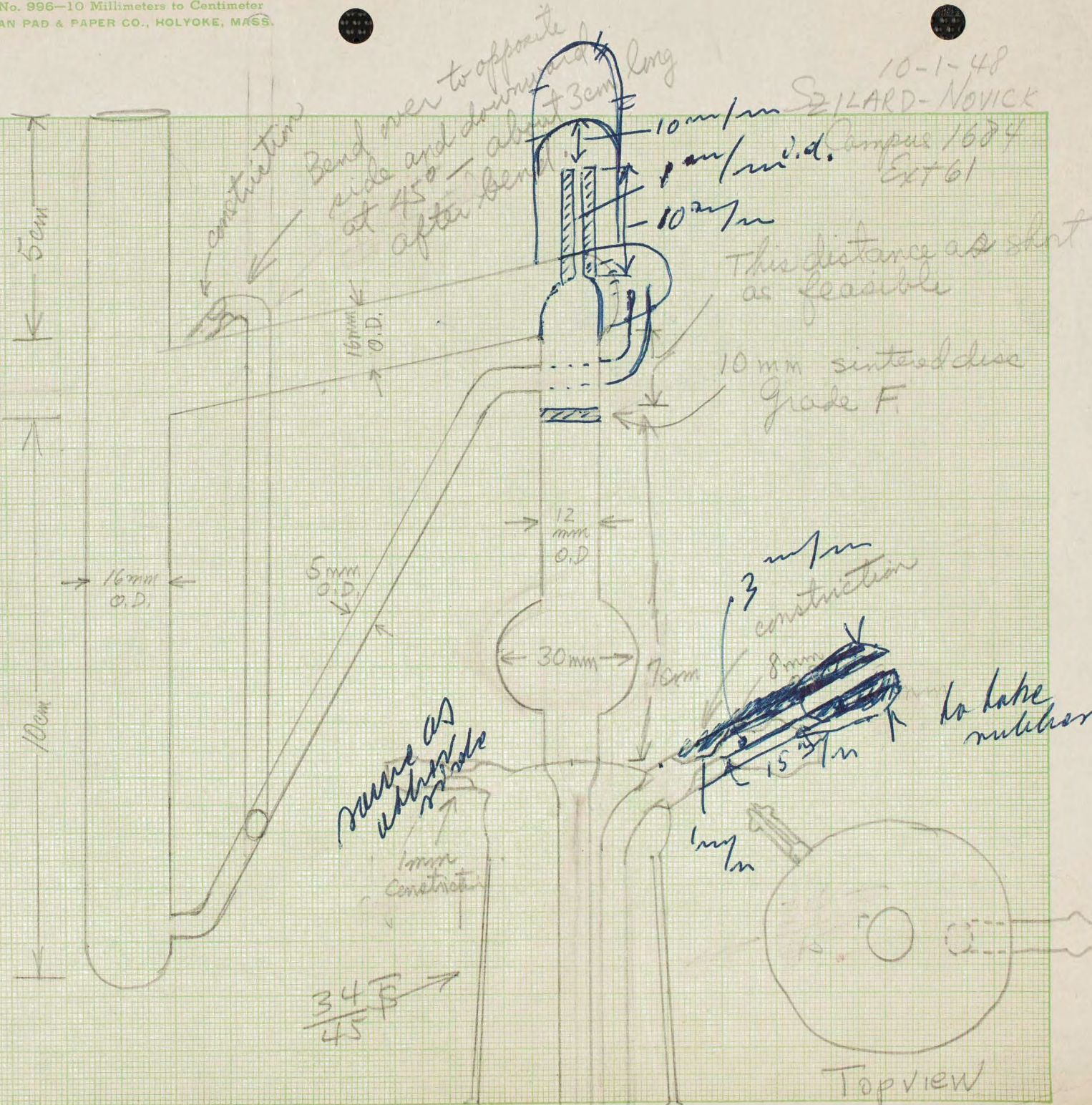


Place 349 =  
265  
6  
370

10-1-48

SZILARD-NOVICK

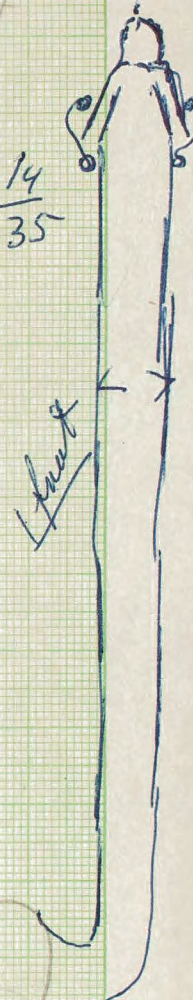
Patent 1684  
Ext 61



10-1-48  
SZILARD-NOVICK

Cambs 1684  
Ext 61

$\frac{14}{35}$

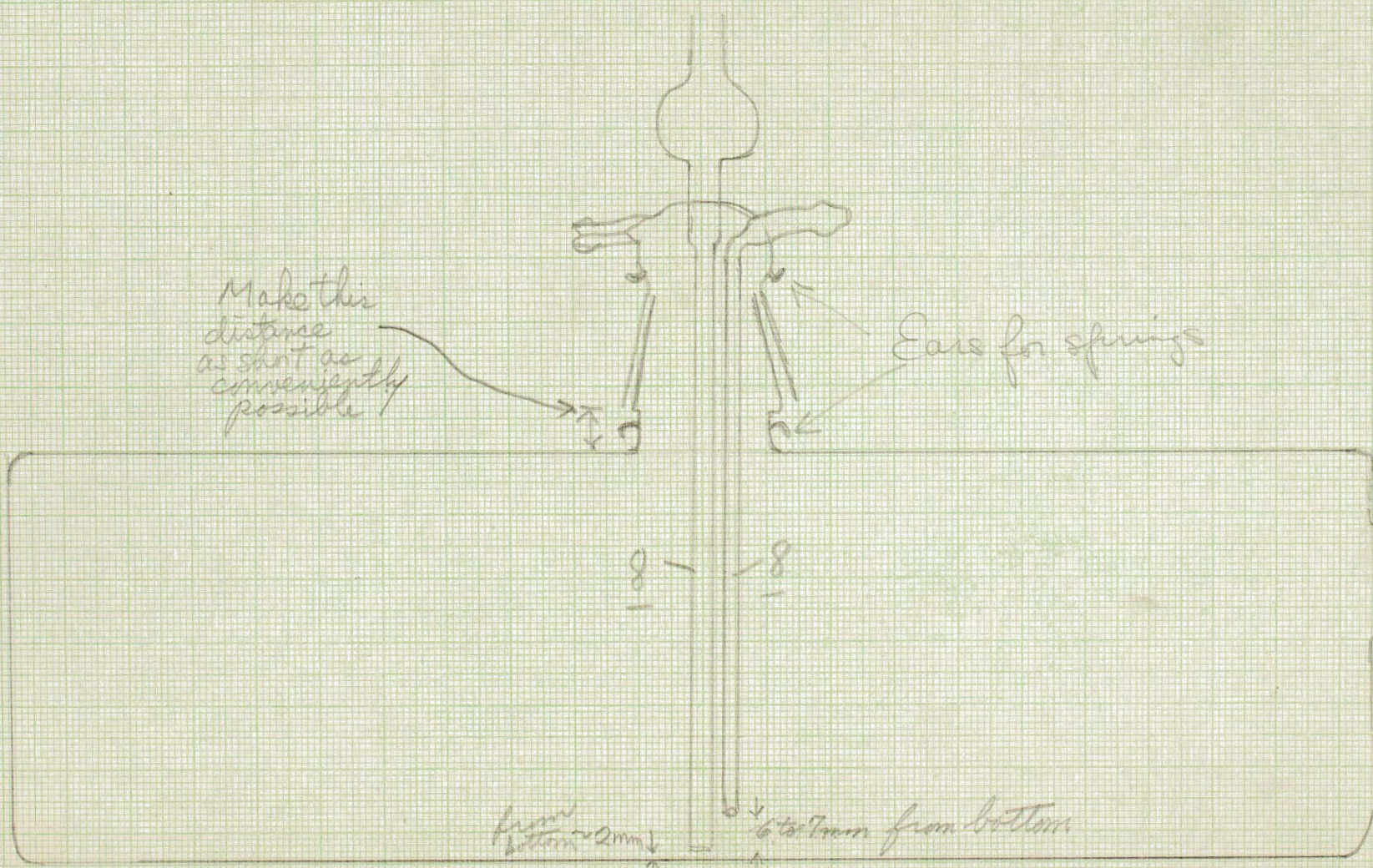


Make this  
distance  
as short as  
conveniently  
possible

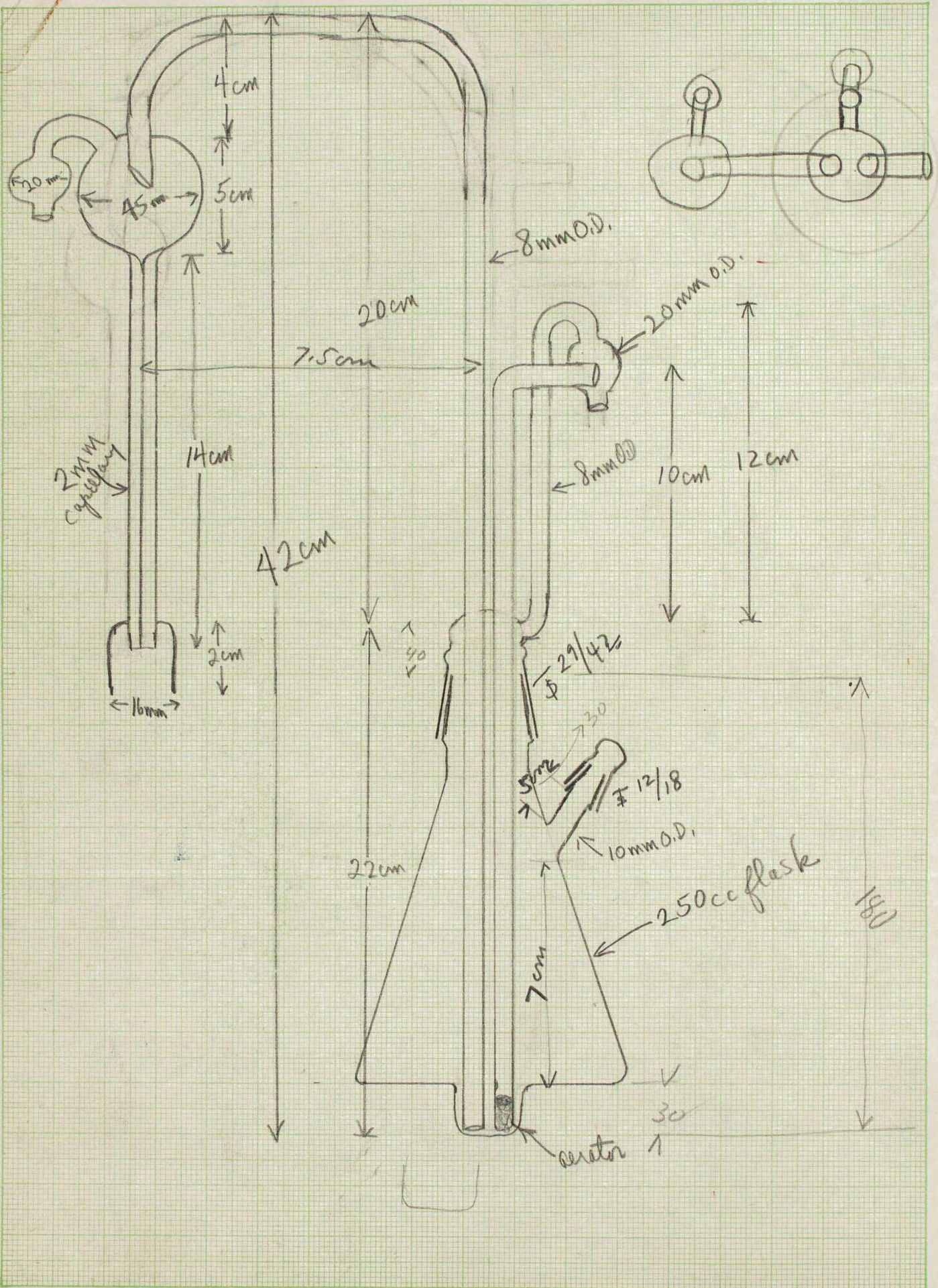
Ears for springs

8-8

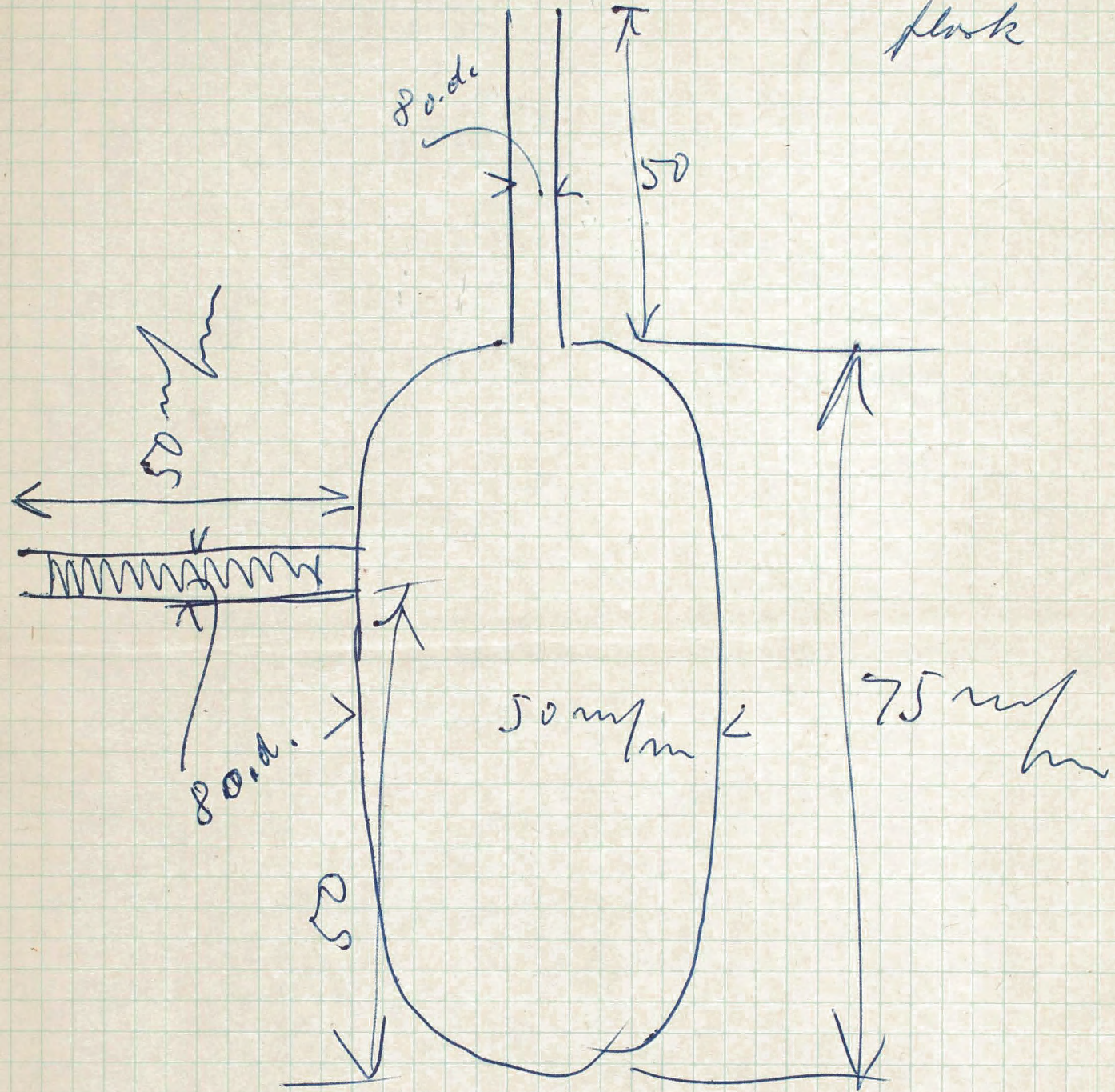
from bottom 2mm  
6 to 7mm from bottom

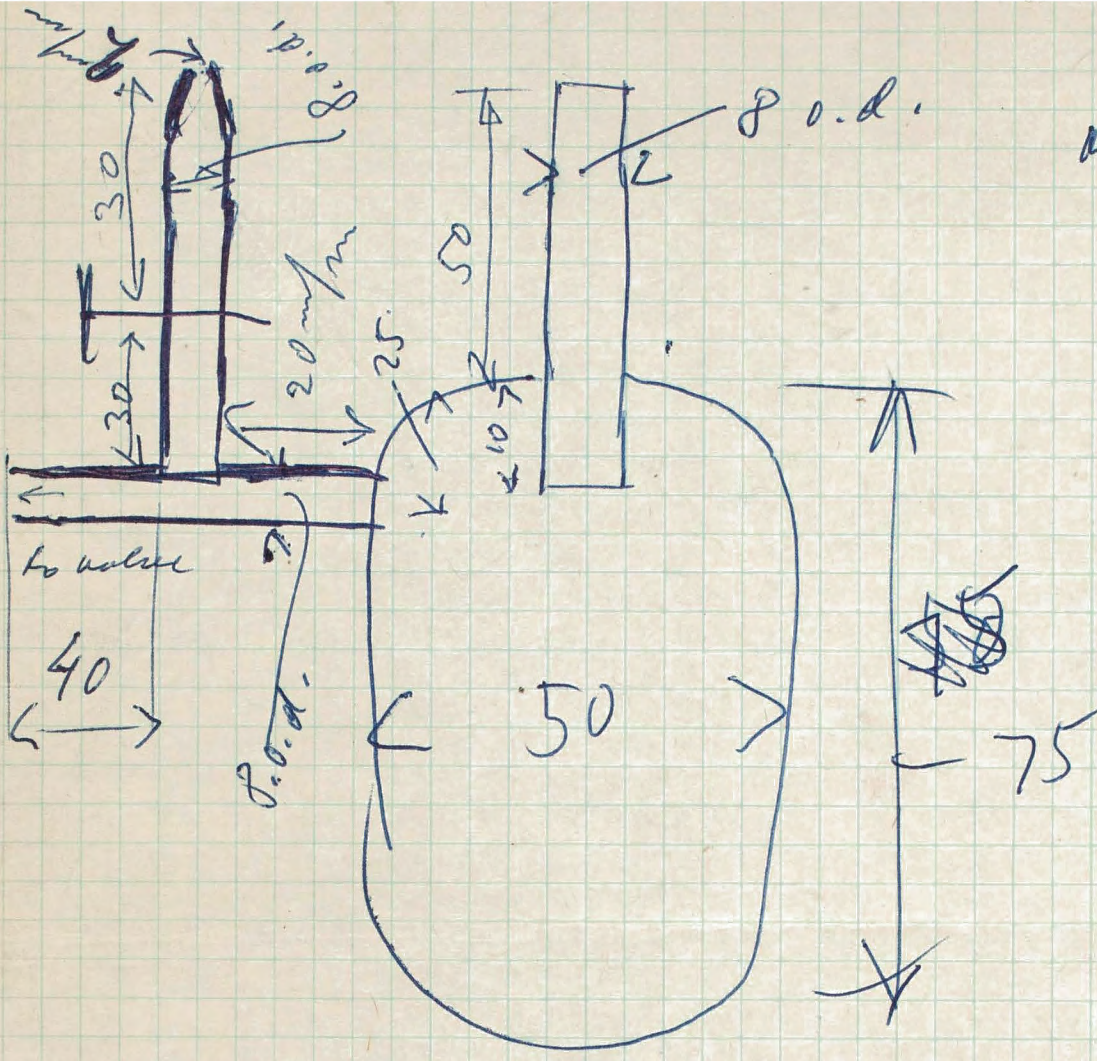






Air inlet into  
block





air outlet  
block  
Chromostat I