3/26/53

— 2238X1655 Lp_2^s gal_3 – protoproph – entered in stocks as 2297

3/30/53 –

811 direction
no odd 44
2175t750 (-)seg 332
2175t750 (+) solid smear } these from same segregation

750 no odd 1
2175t750(-)seg 212

1924 no odd 28
N16 (1-100) c. 3000

1/14/55
3000x10x100 = 3x10^6 [illegible]/ml

Thursday 6/11/53 — Analysis by the spot method

Expt. S - 811 x 902 — the (−) segregant - 24 picked, 19 (−) secured, 6 prob. stable (+)

	Segregant	Background	811-8	/N16 (1+00)	Probable locus	Character of bact. culture
lysate ✓	1.	7	0	s. smear	4−	rough
	2.	mixed ē (+)?	6 kgrd.	s. smear	4−	smooth (dense to mar?)
✓	3.	2	0	solid smear	4−	smooth
✓	4.	1	0	s. smear	4−	rough
	5.	<1	>30	<1	2−	smooth
✓	6.	<1	0	s. smear	4−	rough
✓	7.	3	0	s. smear.	4−	smooth
✓	8.	<1	0	s. smear	4−	rough
	9.	<1	>30	1	2−	smooth
✓	10.	<1	0	s. smear.	4−	rough
✓	11.	<1	0	s. smear	4−	rough
✓	12.	2	0	s. smear	4−	~~rough~~ ~~smooth~~
✓	13.	2	0	s. smear	4−	smooth
	14.	<1	0.	s. smear	4−	rough
	15.	1	0	s. smear	4−	rough
	16.	2	>30	2	2−	smooth
	17.	1	0	s. smear	4−	rough
	18.	mix ē (+)?	6 kgrd	s. smear	4−	rough
	19.	1	1	s. smear	4−	rough

6/18/54 Stock 4 twice, expt. discarded. S16 retained

16 gal$_1$− = 12 rough 4 smooth (1 dense + contam?)
3 gal$_2$− = 3 smooth

At this time gal$_1$ 902 gave smooth culture
gal$_2$− 811 " rough culture

Lysates	Spot test /811	/2175 (old cult.)	Prob. locus	
no. lys. spot / no. contact spots:				
S1	1/1	0/0	4	← S2 was HFT / 2175, 750
S3	0/1	2/0	4	
S4	0/1	5/0 (plaques)	4	
S6	0/1	5/0	4	
S7	1/1	2/0	4	
S8	0/0	3/0	4	
S10	1/0	2/0	4	
S11	0/0	1/0	4	
S12	0/0	0/0 (new lysate?)	4?	
S13	0/0	1/0	4	

7/8/54 10 colonies tested for HFT
only one #8, = NFT = 202-16N
#1 HFT = 202-16H

Crosses — X1436 EMS gal$_1$

wortzel ok	S14 − 95, 75, 70, 85, 215	= 0t/590		
	S15 − 82, 49, 70, 62, 99	= 0t/362		
	S17 − 73, 51, 68, 51, 61	0t/304		
	S19 − 92, 76, 63, 122, 111	0t/364		

II controls ok except S14 - Redo S15

533, 609, 459, 370, 479, 538	= 2988	0t/3528	
1 plate crowded - 452 x 6 plates	= 2712	0t/3074	
" " = 509 x 6 "	= 3054	0t/3358	
" " = c.2000 x 4 "	= c.8000	0t/8000	

Crowded Seg

III controls ok 2/3/54			2/3/54	
X1436			X902	
1572 x 8 =	0t/12576	0t/16104	II 0/650	34/439 37/589
>332 x 8 =	0t/2656	0t/5730	I 0t/164	
			0/142, 0/0 = 0/222	
>6048 - 4848 (+) =	0t/12848		0t/171	

Lysates contin.

S14	1/1	10/0	
S15	1/1	0/0	
S17	1/1	5/0	
S18	1/1	solid smear	HFT gal$_1$: see chart p 210
S19	1/1	4/0	

									2/4/54 controls ok		
			2/3/54 Gal$_2$ =	2/3/54 controls ok	II				X902 I	II	total
S5	6 B/1	0/<1	5/0	X 1436					0/1601	0/226	0/827
S9	8/1	0/<1	15/0	14/1400 x 8 =	11,200	6t/3888		6t/10648	0t/510	0/108	0t/718
S16	solid HFT smear	2/<1	solid smear ← HFT stock	8404 8 =	0t/6720	3t/2432	(3t)	5008	0t/272	0/137	0t/409
				>824 x 8 =	0t/2368						

6/15 - 6/16 53

1485 Transduction to (-) with N1 (gal, HFT)

Two minus obtained. Tested against N1 (1-100) N16 (1-100) (both AFT) lysates

	/N16	/N1	locus	tp
1.	solid smear	no effect	1⁻	+
2.	s.s. lysis	n.s. - lysis	1⁻	s (?)

1673 Transduction to (-) with N1, N16 (HFT's)

9/3/54 2432 suspected of being mixed with gal 4. Purified and tested - Growth in pr + glyc 20 hrs ng in pr, or glyc tested as gal 2⁻

1. /N1 no (-) obtained.
2. /N16 3 (-) obtained. ← W2432

6/20/53 test of ±N16		bkgd	/N1 (1-100)	/N16 (1-100)
	1.	0	0	0
	2.	0	c. 50	0
	3.	0	0	0

only one appears to be gal 2⁻ are others tp 2⁺ ? stock made of 2.

(two (1,3) are tp 2⁺ 6/20/53)

1673 Induction of gal - c̄ U.V.

1. closes c. 10-12 seconds 12 (-) obtained on 12 plates.

902 - 6 sp gal + obtained and stored -

→ (N7) 3 spont. + obtained - (appear stable) - stored

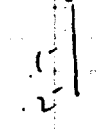
(N1) 2 spont + " " " "

Reassay

	N1λ (1-100)	N16 (1-100)	7238	811-8λ	probable locus
1673 ~~1485~~ N16-1	0	0	0	0	(?)
1673 ~~1485~~ N16-3	0	0	0	0	(?)

1/14/56 This is explainable on the basis that 2342λ is a mixture 1⁻2⁻ and 1⁺2⁻ as indicated by the observation that 2342 is

0
1⁻ | 1⁺
2⁻ | 2⁻



6/16/53 Tuesday -

811 - Transduction with λ mutants to observe fate of infecting phage -

1. no add	26	→	analyze to obtain parental phage type
2. 1485-1	105	→	" " " " " mutant phage type
3. 1485-6	262	→	" " " " " " "

2175
1. no add 9
2. 1485-1 63 } as 811
3. 1485-6 183

discarded

6/16/53 Wednesday -

Experiment Q - 518 EK-12 (-) segregants. Spot tests

Segregant	No add	N16 (1-100)	811A-8	Prob. loci
Q 1	1	s. smear	1	4 -
2	2	s. smear	0	"
3	contaminated c		+	
4	1	solid smear	2	"
5	1	" "	1	"
6	0	" "	1	"
7	1	" "	1	"
8	1	" "	1	"
9	1	" "	2	"
10	0	" "	1	"
11	2	" "	2	"
12	1	" "	0	"
13	0	" "	1	"

Lysates	811	2175	Probable Loci	811	2175
Q 4	1/1	8/1	4 -		
6	lysis	3/1 partial lysis	4 - R ok reassay	2/2	5/1
8	1/1	6/1	4 -		
10	3/1	25/1	4 -		

Crosses	X 1436		
Q8	control streak	104, 152, 173, 176, 231	= 0+/896
Q6	on EMB gal	144, 184, 107, 280, 203	= 0+/918
Q4	show no (+)	238, 214, 181, 129, 372	= 0+/1134
Q10	—	191, 168, 153, 178, 173	= 0+/863
			3811

6/18/53 Thursday

2175 ductions to obtain more (-) segregations and

				Fraction (-) at ②	③	
1. no add	14					(Σ to obtain 19 (-) segs
2. 750/1-2 (1)	86					
(2)	76	all plaqs but one	5/24	6/24	+3 from 1 but in segs	7½ (?) picked
(3)	88					
3. 811λ-8 (1)	77	each set				
(2)	80	stored .24	10/24	11/23	← those circled with 7 (+) previously obtained – 2 lost = (16) or (+)	
(3)	77	top picked from each plate				

750 ductions & 8h. more (-) segregants

1.	no add	4	
2.	811λ-8 (1)	5	all picked (26)
(2)		9	
(3)		10	
		Σ = 26	

0/26 after ②

1673 gal (-) mutations U.V. induced p. 203 tested

Gal- mut. no.	/N1(1-10)	/N16 (100)	22381-1	811λ-8	bkgrd	probable 10 cc	Comment
1.	bkgrd	bkgrd	bkgrd	bkgrd	high	?	appears to be slow - discard
2310 2.	6-10	c. 50	6-10	6-10	6-10	?	transduced only by 2
3.	<bkgrd	>bkgrd	<bkgrd	<bkgrd	c. 20	?	transduced doubtfully by 2 probably slow
2311 4.	<bkgrd	solid smear	<bkgrd	<bkgrd	c. 10	?	transduced only by 2
2312 5.	0	c. 20	0	0	0	?	transduced only by 2
2313 6.	solid smear	3	2	20	c. 0	2? or new locus?	
2314 7.	solid smear	c. 70	4	c. 30	c. 0	new locus ?	
2315 8.	solid smear	solid smear	0	c. 25	0	3-	
9.	c. 25	solid smear	c. 10	c. 10	c. 10 (small)	?	transduced only by 1 & 2
10.	2-3	c. 50	2-3	2-3	2-3	?	
11.	>bkgrd ?	bkgrd	bkgrd	bkgrd	high	?	

All λ⁻-one spot clear lysis

See

6/26 Repeat on above — restreak all with high bkgrd — 1, 2, 3, 4, 9, 11 established

2.	2	>100	3	4	5	1+? 2nd	1-	
4.	5	solid smear	5	2	3	1+? "	"	
5.	0 *	0 * ✓	0 *	0 *	?	?	"	+ by 811 t possibly by K-12 λ
6.	>100	10	2	>30		2-	+ 2 2	rev not 811 transd. K-12 / not t by 811 t K-12 λ
7.	>100	>50	0 ? mixed →	>30	0	3-	3-	
8.	>100 (250)	>100 (210)	0	80	>20 see 0	3- (?) spt.	3-	
9.	0	+++(?)	0	>50 small	0	(13)- (?)	double	
10.	0 *	>30 (small)	0	0 *	c	2nd double (?)	double	
11.	0	0	0	0	0	(?) new	new	

Hybrid gals transd. all(?) by

* plaques in bkgrd. of spot

SEE PAGE 220

7/2

1673 gal-#5 X 811 - controls 5h.

1. 1+/27
2. 0+/19
3. 0+/24

1+/84

0.012 / 84/160 / 1.0J

1.2% revrnts.

206A

12

Needed

Cyt. M — 750 t K-12 crosses of M's x 750 sr

N — 750 t 902 " N gal$_1$- x 750 sr

O — 2175 t K-12 complete

P — 518 t 750 (ductions)

Q — 518 t K-2 lysate test and crosses x 1436 gal$_4$-

R — 518 t 902 crosses of (R gal$_2$- x gal$_1$ / R gal$_4$- x gal$_4$) and lysates of gal$_2$-

S — 811 t 902 crosses of (S gal$_2$- x gal$_1$- / S gal$_4$- x gal$_4$-) and " " gal$_2$-

T 2175 t 750 all

U — 2175 t 811 crosses, lysates) in general

V — 811 t K-12 20/26

W — 1924 t 902 19/24

Thursday 6/25/51

Expt. A. 2175 Å Pl (-) xg vegans. spot tested

	~~Genes~~	~~Phage~~	N16 $^{2-}$ (1-10)	811 λ-8	Prob. Lines			∠λ-2	Reactions	N1 (1-10)	049 gt (1-10)	N16 (1-10)
	1	1	2	3	4 (?)	+	1	sens.	1	0	c. 200	c. 100
	2	0	1	> 100	(also λ^s) 2$^-$		2	"				
	3	0	0	6	2$^-$		3	"				
	4	1	2	11	2$^-$		4	"				
	5	0	solid smear	0	4$^-$	+	tst	"	2			
	6	0	1	12	2$^-$		5	"				
	7	0	0	13	2$^-$		6	"				
	8	0	1	9	2$^-$		7	"				
	9	0	0	9	2$^-$		8	"				
	10	1	0	8	4$^-$ (?)	+	9	"	3	0	c. 200	c. 100
	11	1	1	8	2$^-$		10	"				
	12	0	solid smear	0	4$^-$	+	tst	"	4			
	13	0	1	L	4$^-$ (?) L	+	11	"	5	0	c. 200	c. 100
	14	0	solid smear	0	4$^-$	+	tst	"	6			
	15	1	2	10	2$^-$		12	"				
	16	0	2	1	4$^-$ (?)	+	13	"	7	0	c. 200	c. 200

9 2$^-$
1 4$^-$

Cross 1. —

13

hypate mode 2/5/54

new #		811	2175	758
U1	U1	50/1	1/0	22/0
U9	U10	70/1	0/0	61/0
U11	U13	20/1	3/0	14/0
U13	U16	30/1	0/0	16/0

Col - are 2$^-$ because of conflict with above results. All 4 strains retested against N16, 818

2/8/54

		N16 λ	818 λ
Remember but in order above	1.	0	+
	2.	" (4^s)	" (4^s)
	3.	"	"
	4.	"	"
	5.	"	"
	6	"	"
	7	"	"
	8	"	"
	9	"	"
	10	"	"
	11	"	"
	12	"	"
	13	"	"
		Acc 2$^-$	

in view of the results suggest culture expt be redone - were the 4$^-$ really so or perhaps 2$^-$4$^-$ which later reacted to give the above results?

2/24/54 Slant made of U2 since it is last discarded

Saturday 6/27/53

~~22~~ 97 ductions to obtain segregant.

		control half	0.05ml/remain half
1.	750λ-2	2	88
2.	902λ-4(?)	5	34
3.	811λ-8	12	56

24 picked from each and streaked - Source of galz - segregants - (1)

750 24/24 stable after 3

902 22/22 stable after 3 & lost of orig. 24

811 20/23 stable after 3 3 questionably unstable, 1 lost.

7/5/53

902 lysate - 902λ - 7/4

Spotted against	2175	811
	0/1	100/2

Transductions for the purpose of obtaining segregants.
Spread plates

811 -

			2nd strk	(+) picked
no add	41			
K-12λ 12/20	573	← 24 picked & streaked.	22/26 unst	20/20

1924.

			2nd strk	(-)'s picked	2nd wave	total
no add	31					
K-12λ 12/20	320	← 24 picked from each & streaked	13/24 unstbl	13/24	16/24	= 29/48
750λ	25	probably doesn't transduce				
902	235	←	19/24 unstbl	19/24		

Sunday
July 5, 1953

Experiment T — 2175 transduced by 750 1 — the (-) segregants. Spot tested against N1 (1-100) and N16 (1-100)

Segregant	Bfgal	N1 (1-100)	N16 (1-100)	Lysable locus	Bact. characteristic
T1	0	c.50	0	2⁻	R
2	0	c.50	0	2⁻	S
3	0	c.50	0	2⁻	R
4	0	0	>100	1⁻	S
5	0	>50	0	2⁻	R
6	0	0	>100	1⁻	R
7	0	c.50	0	2⁻	S
8	0	c.50	0	2⁻	R
9	0	c.50	0	2⁻	R
10	0	>50 smear	0	2⁻	R
11	0	>50 smear	0	2⁻	S
12	0	c.50	0	2⁻	S
13	0	0	>100	1⁻	S
14	0	c.50	0	2⁻	R
15	1	>50	0	2⁻	R
16	0	c.20	0	2⁻	S
17	0	c.20	0	2⁻	S
18	0	0	0	? 4pi⁻	R
19	0	0	0	? 4pi⁻?	S

all small after 2 days

tested 4pi⁻ (7/5)
4pi⁻ (7/5)

14 gal2 -
3 gal1 -
this may be 2⁻ — 2 (?)

Recheck	K-12 λ	8921 (1-100)
blg's	65	20
= 0	41	28

9/2/53
T1P not ↓ by 811

4 S
gal2 - 2 R
gal1 - 2 S
1 R
? 1 S
1 R

9/2/53
2070 to study on exp. taken from 1,4
Failure &c

Lysate examinations

	750	2175	2297	811	816	1924
T18	0/0	0/1	3/1	12/2	25/4	11/3
T19	2/0	1/1	1/1	5/2	19/4	8/3

stable

6/6 stable (1)
6/6 stable (2)

Lysates of T18, T19 on

(1) 811/ET18 → segregant 1 = gal1 gal4⁻ ? not ↓ by HFT 4⁻ 1⁻
(2) 1924ET18 " 1 = gal2 - ? not ↓ by HFT 2⁻
(3) 1924ET19 " 1 = gal1 - ? " " " HFT 1

9/16/53 Second lysates of T18, T19 made — tested against 2297 — segregants isolated for

	2297	unstable ½
T18-1	67	13
-2	110	16
T19-1	135	26
-2	240	30

24 picked after 2 stable 3/24 unstable

23 picked — all stable after 2 stab.

Lysates (not good) made of	750	2175	Crumble hours
6	0/0	0/1	1⁻
13	0/0	0/1	1⁻

7/24/54
Short Stocks of T18 T19 retained — used as host in making of assay

July 6, 1953
Monday

750 X 1436 cross - on EMB gal - controls on a EMB gal

	(+)	total
1.	0	614
2.	0	677
3.	2	854
4.	1	835
5.	2	660
6.	1	958
	6	4588

750 = 1- Lp+ 4+
1436 1+ Lp- 4-

Lp closer to 1 than 4

$4588 \overline{)6.000}$ = 0.0013 = 0.13 % recomb.

4588
14120
13764

6/6 (+) recomb. stable on EMB gal

1 (+) recomb appears mixed for Lp - Lp+ Lp-

5/6 (+) λ s

7/7/53
Lysate tests

	750	2175	2297	811	1924
control spot	0	0	0	2	0
2238 λ	0	2	0	3	0
2251 λ	0.40	0	2	0.40	0
S18 (isolate) λ	solid smear	solid smear	solid smear	1	0

Relationship of gal's - Lp.

above gal4 - gal1 = 0.13 % +
expt. R gal4 - gal2 = 0.21 % +
p. 199 gal1 - gal2 = 0.13 % +

$\overline{Lp1^+}$ = 0.83 as $\overline{Lp4}$ contrast.
$\overline{Lp2^+}$ = 0.80 as $\overline{Lp4}$ contrast.

7/12/53

$Lp^s\ S^r$

$F^-TLB_1^-Gal_4^-Mal^-V_6^rLac_1^- \times F^+BM^-Lp^+S^sGal_2^-Lac_1V_6^sMal^+$

$\ddot{2}234 \times 1210$

EML's 580B. Cross of $gal_2^- \times gal_4^-$

8/27/53

	Propotroph	2⁻ N16 gal_2^- HFT	4⁻ S18 gal_4^- HFT		Lp(λ)	TL	Strep	Mal	K-12λ
	1	no. reaction	no. reaction	?	r	s	r	−	r
	2	−	+	2	s	r	r	−	s weak
p	3	+	−	4	s	r	r	−	s weak
	4	+	−	4	s	s	s	+	s
	5	+	−	4	s	r	s	−	s
	6	+	−	4	s	r	s	−	s
	7	−	+	2	s	s	r	−	s weak
	8	+	−	4	s	r	s	−	s
	9	−	+	2	s	s	r	−	s weak
	10	−	+	2	r	s	s	−	r
	11	−	+	2	s	r	r	−	s weak
	12	−	+	2	s	r	r	−	s weak
	13	−	+	2	s	s	r	−	s weak
	14	−	+	2	r	s	r	−	r
✓	15	? no react	? no react	?	s	s	r	+	s
	16	+	−	4	s	r	s	+	s
	17	+	−	4	s	r	s	−	s
	18	+	−	4	s	r	s	−	s
	19	−	+	2	r	s	s	−	r
	20	−	+	2	r	s	r	−	r
p	21	+	−	4	s	r	r	−	s weak
	22	−	+	2	r	s	r	−	r
✓	23	+	? −	4	s	s	r	−	s weak
	24	+	−	4	s	s	s	−	s
	25	+	−	4	s	r	s	−	s
	26	+	−	4	s	r	s	−	s
p	27	+	−	4	s	r	r	−	s
	28	+	−	4	s	r	r	+	s
	29	−	+	2	s	s	r	−	s weak
✓	30	no react.	? no react.	?	s	r	r	−	s weak
	31	+	−	4	s	s	r	−	r
✓	32	no react	no react.	?	s	r	r	−	s weak
	33	+	−	4	s	s	s	−	s
	34	−	+	2	s	r	r	−	s weak
	35	+	−	4	s	r	s	+	s
p ?	36	small + no.	−	4	s	r	r	−	s weak
✓	37	small? + no.	−	4	s	r	r	−	s
	38	+	−	4	s	r	s	−	r

Gal_4^- = 21 Gal_2^- = 13

4 gal_2^- gal_4^- ?

weak 1x 8 gal_2^- 4 gal_4^- 2 gal_2^-

Parental

○ = 2234

6/18/54
Accord. several statements of EML parents of this expt are in doubt

7/18/53 ref to ductum page 208

Expt. V - 811 t16-12 (-) segregants. Spot tested with N16 (1-100), S18 (1-100) gal2-HFT gal4-HFT λ

Segregant	/N16 (1-100)	/S18 (1-100)	Stocks as of 2/24/54
7.	+	–	
2.	+	–	lost
3.	+	–	"
4.	+	–	"
5.	+	–	"
6.	+	–	
7.	+	–	
8.	+	–	
may be contaminated ε + 9.	+	–	lost
10.	+	–	
11.	+	–	
12.	+	–	
13.	+	–	
14.	+	–	
15.	+	–	
16.	+	–	
17.	+	–	
18.	+	–	
19.	+	–	
20.	+	–	
	20 gal4 -		

(+) = c 500 pap./drop (-) = no pap./drop.

Cross X1436
V2
V10
V12
V18

6/18/54 Stocks of this Expt discarded

Tysets tested 1/22/53

	Spotted /811	/2175
V1	2/1-2	30/0.1
10	3/1-2	14/0.1
12	0/1-2	10/0.1
18	2/1-2	14/0.1

7/13/53

Expt. W 1924 t 902 (-) segregant. Tested c̄ N16 (1-100) and S18 (1-100)

W2893

Segregant	N16 (1-100)	S18 (1-100)	Proportionate tests	λ recd/S18
1	−	+	2-	n. lys
2	+	−	4-	"
3	+	−	4-	"
4	−	+	2-	one plaque
5	+	−	4-	no. lys.
6	+	−	4-	"
7	+	−	4-	"
8	+	−	4-	"
9	+	−	4-	"
10	+	−	4-	"
11	+	−	4-	"
12	+	−	4-	"
13	+	−	4-	lysogenic
14	−	+	2-	no. lys.
15	+	−	4-	"
16	+	−	4-	"
17	+	−	4-	"
18	+	−	4-	"
			15 gal_4-	1 Lp^+
			3 gal_2-	17 Lp^+

Cross × 902, 1436

1
4
14
17
18

2/24/54

The stocks of this [illegible] in [illegible] shape. Slant made of W1 since it is gal_2^- Lp^R

Reversions of W1 tested spring "55" (see page) One found diploid. Possibly W1 was $\frac{Lp^+}{Lp^R}$ $\frac{Gal_2^-}{Gal_2^-}$

no. segregating / no picked

ratio) duction plate / control plate

Transductions Made

λ Source

	(+) K-12	(gal1-) 750	(gal2-) 902	(gal3-) 2238	(gal4-) 811
(gal1-) 750 prototroph	17/24(?) M 143/1 (190)		23/24 N 84/1 (190)		0/26 (206) 27/12
(gal2-) 2175	22/24 O 248/17 (191)	19/72 T 83/14 (206)			16/49 (206) 77/14
(gal3-) 2297		0/24 88/2 (208)	0/22 34/5 (208)		3(?)/23 56/12 (208)
(gal4-Lp^s) 518	13/24 Q 835/19 (200)	doubt 72/29 (189) 80 ?	23/24 R 472/11 (191)		
(gal4-Lp^t) 811	20 573/41 (288) 26	doubt 96/51 (195) 80 ?	19/24 S 147/47 (140)		
(gal4-Lp^r) 8924	29 326/31 (208) 48 216	doubt 80 ? (208)	19 238/31 (208) 24		

second lot borrowed pg 140

B. The occurrence of stable transductions.
Exp. = no. of stable (+) expected, Obs. = no. of stable (+) observed.
Comparable (equivalent) no.s considered.

Lambda Source

Lambda Transduced	K-12 Exp	K-12 Obs.	gal$_1^-$ Exp.	gal$_1^-$ Obs.	gal$_2^-$ Exp.	gal$_2^-$ Obs.	gal$_3^-$ Exp.	gal$_3^-$ Obs.	gal$_4^-$ Exp.	gal$_4^-$ Obs.
gal$_1^-$	1/143	42			1/84	3.5 $\chi^2 = 6.25$	not done		12/27	27 *
gal$_2^-$	17/248	20.7 $\chi^2 = 0.87$	14/83	61.1			not done		14/79	52.1
gal$_3^-$	not done		2/88 (all stable)	88	5/34 (all stable)	34			12/56	48.7
gal$_4^-$ Lp^s	19/835	383	29/72 (all stable)	72 *	11/472	19.7	not done			
Lp$^+$	41/573	133	51/96 (all stable)	96 *	47/147	30.6 **	not done			
Lp^r	31/370	127	$\frac{\text{ratio 'duction plate}}{\text{control plate}} = \frac{25}{31}$ *		31/238	49.6 $\chi^2 = 12.7$	not done			

* 'duction does not go well apparently

** estimated from two different experiments

Expected = $\frac{\text{control (sp. pop.) plate}}{\text{phage plate (= sp + transd.)}}$ Obs. = $\frac{\text{no. stable obs.}}{\text{no. in sample taken}} \times \frac{\text{no. phage plate (sp + transd.)}}{\text{no. in sample taken}}$

Key to Experiments

Lambda Source

Recipient Cells	K-12	750 gal$_1$ -	902 gal$_2$ -	2238 gal$_3$ -	811 gal$_4$ -
gal$_1$ - 750 prototroph	Expt. M p. 192A		Expt. N p. 192B	not done	no expt. designation p. 206
gal$_2$ - 2175 (902 prototroph)	Expt. O p. 196	Expt. T p. 209		not done	Expt. U. p. 207
gal$_3$ 2297 (2238 prototroph)	not done	no. expt designated All stable p. 208	no expt. designated All stable p. 208		no. expt. designation All stable p. 208
518 gal$_4$ hp^s	Expt. Q p. 205	no. expt designated all stable p. 189	Expt. R p. 198	not done	
811 " hp^t	Expt. V p. 212	no. expt designated all stable p. 195	Expt. S p. 208	"	
1924 " hp^r	Expt. X p. 216	no. expt designated all stable p. 208	Expt. W p. 213	"	

No. segregants	
class. by transduction test	(what they are transduced by)
class by donor test	(what they can transduce ≡) usually 4 seg. taken at random
class by test cross	

Lambda Source

Recipient cells	16-12 ~~gal+~~	gal_1^-	gal_2^-	gal_3^-	gal_4^-
gal_1^-	17 17 gal_1^- 4/4 gal_1^- 4/4 gal_1^- (incomplete)		23 18 gal_1^- 5 gal_2^- 5/5 gal_2^- 4/4 gal_1^- 5/5 gal_2^- / 4/4 gal_1^- {incomplete}	not donor	Stable (+) ?
gal_2^-	20 20/20 gal_2^- ~~4/4~~ gal_2^- 4/4 gal_2^- (inc.)	19 14 gal_2^- 3 gal_1^- 2 (?) doubles? incomplete 2(?) transduce gal_4^- inc.		not donor	16 8 gal_2^- 4 gal_4^- 4 (?) doubles? incomplete
gal_3^-	not donor	stable (+)	stable (+)		stable (+)
gal_4^- Lp^s	13 13 gal_4^- 4/4 gal_4^- 4/4 gal_4^- (inc)		21 18 gal_4^- 3 gal_2^- 14/16 gal_4^- (gal_2^- incomplete) 4/4 gal_4^- (complete) 3/3 gal_2^- (incomplete)	not donor	
Lp^r	20 20 gal_4^- incomplete incomplete	(+)	19 16 gal_4^- 3 gal_2^- 15/15 gal_4^- gal_2^- (incomplete) 4/4 gal_4^- (complete) gal_2^- incomplete	not donor	
Lp^r	29 29 gal_4^- incomplete incomplete	stable (+)	18 15 gal_4^- 3 gal_2^- (4°) incomplete incomplete	† donor	

Occurence of HFT Lambda (Among Segregants)

Lambda Source

Recipient cell	K-12	gal$_1^-$	gal$_2^-$	gal$_3^-$	gal$_4^-$
gal$_1^-$	0/4		1/5 gal$_2^-$ HFT 2/4 gal$_1^-$ HFT	not done	not done stable (+)
gal$_2^-$ <	0/4	~~not done~~ one unstbl. + HFT		not done	not done
gal$_3^-$	not done	stable (+) not done	stable (+) not done		not done
gal$_4^-$ lp^s	0/4	not done stable (+)	0/16 gal4$^-$ gal$_2^-$ not done	not done	
lp^t	not done	not done stable (+)	1/15 gal4$^-$ gal$_2^-$ not done	not done	
lp^r	not possible	not do stable (+)	not possible	not done	

Previously unstable (+) from 578 t K-12

750 t 1821 (gal$_1^-$ traced by gal$_4^-$)

1436 t K-12 (gal$_4^-$ t K-12)

I ignore this
I ignore - other evidence indicate 2281 not gal-
but Gal-

(214)

IGNORE

7/16/53 Thursday

2257 - test crosses to examine its authenticity as gal_2-

1. X750 on EMS gal

	(+)	total
1.	1	285
2.	0	359
3.	3	505
4.	0	453
5.	0	355
	4	1957

1957) 4.000 = 0.0020
3914
960

2. X811 on EMS gal

1.	0	167
2.	0	148
3.	0	225
4.	0	270
5.	0	229
	0	1039

Since both give (+) and doesn't something correct with cross 1? says no!

3. X 2281 (ie gal_2 - Lp's)

1. 1/4 of one plate counted = 342 = 1368 / plate x 5 plate = 6840
3(+) colonies observed

6840) 3.0000 = 0.00044
27360
26400

= 0.044% recomb. between 2 gal_2 - Needs checking

Rpt 9/10/53
10 plates - control ok

0.2% ← 1. 1/4 = 114 x 4 = 456 x 10 = 4560

4(+) / 6517

6517) 4.0000 = 0.0006
39102

= 0.06%

2251 x 2281

Rpt 9/10/53
10 plates - control ok

1. 1/4 = 241 x 4 = 964 x 10 = 9640

10/13/53
1/4 = 78 = 312 x 6 = 1872

1872
11,512

K-12 =
750 = 750 + 2
902 = 902 7/14
891 = 891 - 8

7/19/53 Sunday.

750 cell no.s vs constant K-12 λ

Aerated cultures used - 2 20ml overnight Pen. Growth resuspended in about 1.5 ml. Dilutions made and plated with and without K-12 λ - (0.1ml + 0.1ml K-12 λ)

Sol	Dilution	+K-12 λ	control	Δ	/750 λ	/902 λ	/811	No. of cells/plate
	med.	12	0		3	82	8	3.6×10^9
0.3 +0.3	1-2	plaque omitted	0		1	74	9	1.8×10^9
0.2 +0.6	1-4	16	2		4	117	7	9×10^8
0.1 +0.7	1-8	46	1		3	106	9	4.5×10^8
(1-1) 0.1 +0.9	1-20	plaque omitted	3		1	793	8	1.8×10^8
(1-4) 0.1 +0.9	1-40	43	1		4	plaque omitted	6	9×10^7
(1-8) 0.1 +0.9	1-80	46	2		1	104	6	4.5×10^7
etc	1-200	plaque omitted	1		4	85	6	1.8×10^7
"	1-400	28	3		2	90	7	9×10^6
"	1-800	18	1		1	69	3	4.5×10^6
"	1-2000	19	1		0	61	6	1.8×10^6

$1 - 2 \times 10^3 \times 10^{-2}$

$1 - 2 \times 10 \times 10^2 \times 10^{-1}$

0.1 ml 1. 2003
2. 1679
3. 1850

2×10^7 dil

$\frac{5532}{3} = 1844 \times 2 \times 10^7$

$3688 \times 10^7 = 3.7 \times 10^{10}$ cells/ml

NO. 32.226. 20 DIVISIONS PER INCH (120 DIVISIONS) BY FOUR CYCLES RATIO RULING.
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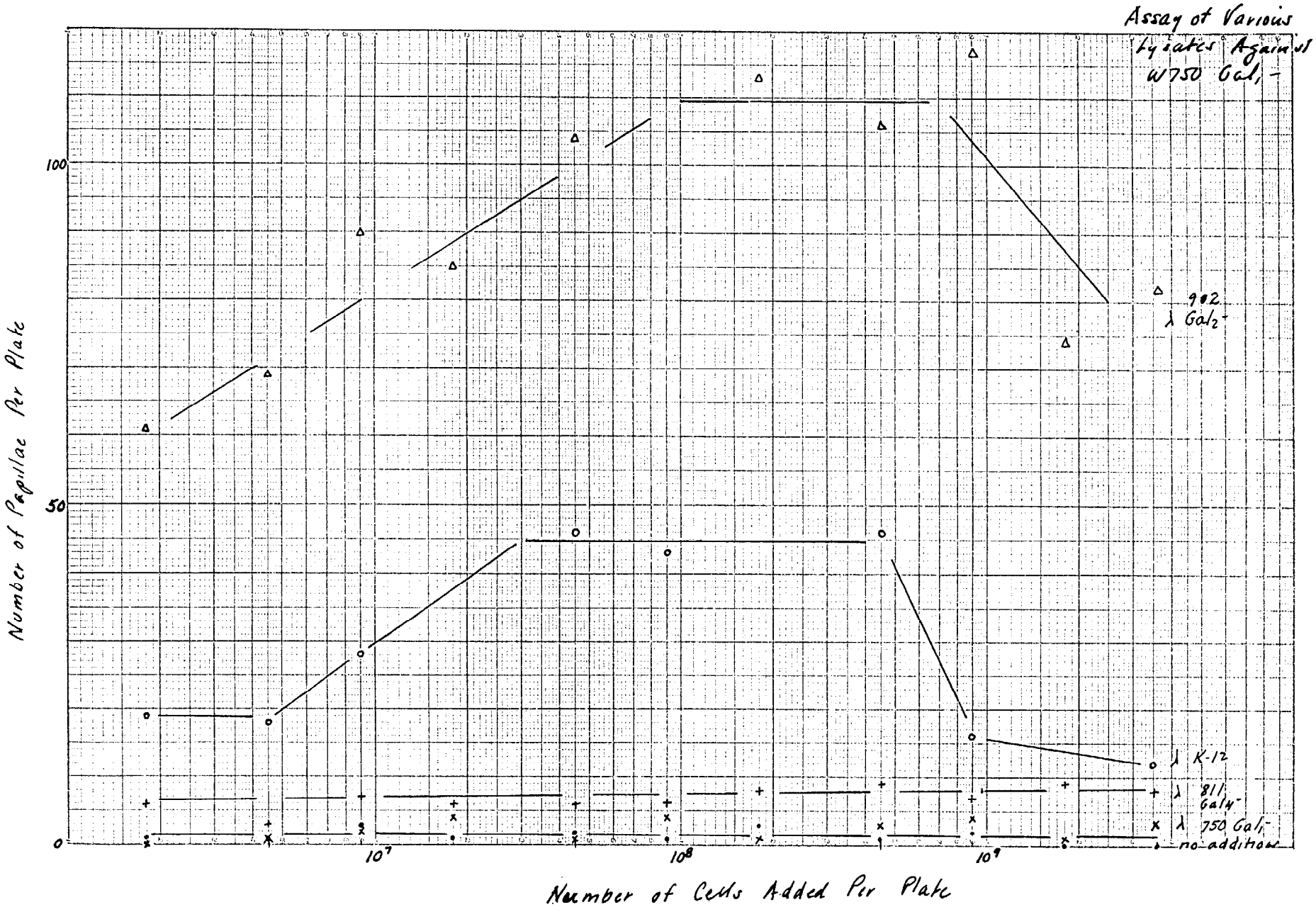


These segregants tested on two plates by cross brushing against HFT λ

7/20/53 Monday.

Experiment X - 1924t K-12 - (-) segregants tested / S18, N16 (HFT galy, HFT gal₂)

Segregant	Exam. for Lys. / S18	/ N16	/ S18
X 1	non-lysog.	solid smear	no react.
2	"	" "	"
3	"	" "	"
4	"	"	"
5	"	"	"
6	"	"	"
7	"	"	"
8	"	"	"
9	"	"	"
10	"	"	"
11	"	"	"
12	"	"	"
13	"	"	"
14	"	"	"
15	lysogenic	"	"
16	nonlysogenic	"	"
17	"	"	"
18	"	"	"
19	"	"	"
20	"	"	"
21	"	"	"
22	"	"	"
23	"	"	"
24	"	"	"
25	"	"	"
26	"	"	"
27	"	"	"
28	"	"	"
29	"	"	"
	1 lysogenic 28 lp⁺	29 galy⁻	

2/24/54

The original cultures of this experiment were lost by discard. A new set obtained not tested - discarded. This data is not worth saving.

7/24/53 Friday - Effect of U.V. on HFT λ. N16 gal₂ - λ used.

N16 lambda diluted 1-10 and irradiated for varying time intervals. 0.5 ml removed and added to 10 ml pen assay broth - Assayed against ~~various~~ gal - rp. forms.

Irrad.	Trial pliage assay	dil 1-10 add. / 2281 EMB gal K		dil 1-10 add. thin / 518 pure plates ← this 518 mixed with galstrain?
0 min.	dil 10^5 → 0.1 ml	2023		197, 120 = 1540
1 "		4628		164, 102 = 1330
3 "		2264	.490	44, 15 = 290
5 "	dil 10^3 → 0.1 ml	1444	.637	17, 18 = 180
7 "		853	.591	3, 6 = 50
9 "		509	.597	35, 17 = 27
11 "	dil 10^1 → 0.1 ml	331	.650	11, 6 = 8
13 "		266	.807	0, 0
15 "		54		0, 0
17 "	und. → 0.1 ml	95		
19 "		10		1, 0

1540 × 10 × 10 × 10 × 20

$3.08 \times 10^5 = 3.1 \times 10^7$

2023 × 10 × 10 × 20 × 2 =

$4046 \times 10^4 = 4.1 \times 10^7$

Transductions (Approximations)

9600 × 10 × 20 × 10

$19.2 \times 10^5 = 1.92 \times 10^7$

	750	2280	2175	2281	811	518	1924
0	3648	6464 (6)	6	0 (9600)	4800	50 (6400)	
1	4056	c. 9000	6	0 (6400)	6400		
3			7				
5			5				not
7			—				counted
9			8			(2400)	
11			6	(3200)		(1600)	
13			10			[illegible]	
15			6	1234		960	
17			8	176		72	
19			3	81		31	
no add			6				

dil 1-20 ↓ 1-10 ↓ 1-10 = 1-2000

rig-liter 437 × 10 × 2000 × 10

874×10^5

8.74×10^7

TRANSDUCTIONS - RPT ASSAY 1-10 dil. of above

dil = $\frac{1}{20} \times \frac{1}{10} \times 0.1$ ml

2368 × 10 × 10 × 20 × 10

$4736 \times 10^4 = 4.7 \times 10^7$

no add						
0 thin plate	thin plate	omit	910	176 (2368)	thin plate
1 thin plate	4296		thin plate	5 (3088)	" 580
3	2216	3344	3744	128 (2832)	2480
5					
7					
9					
11					
13					
15					
17					
19					

Rpt. Assay 1-10 dil of previous assay.

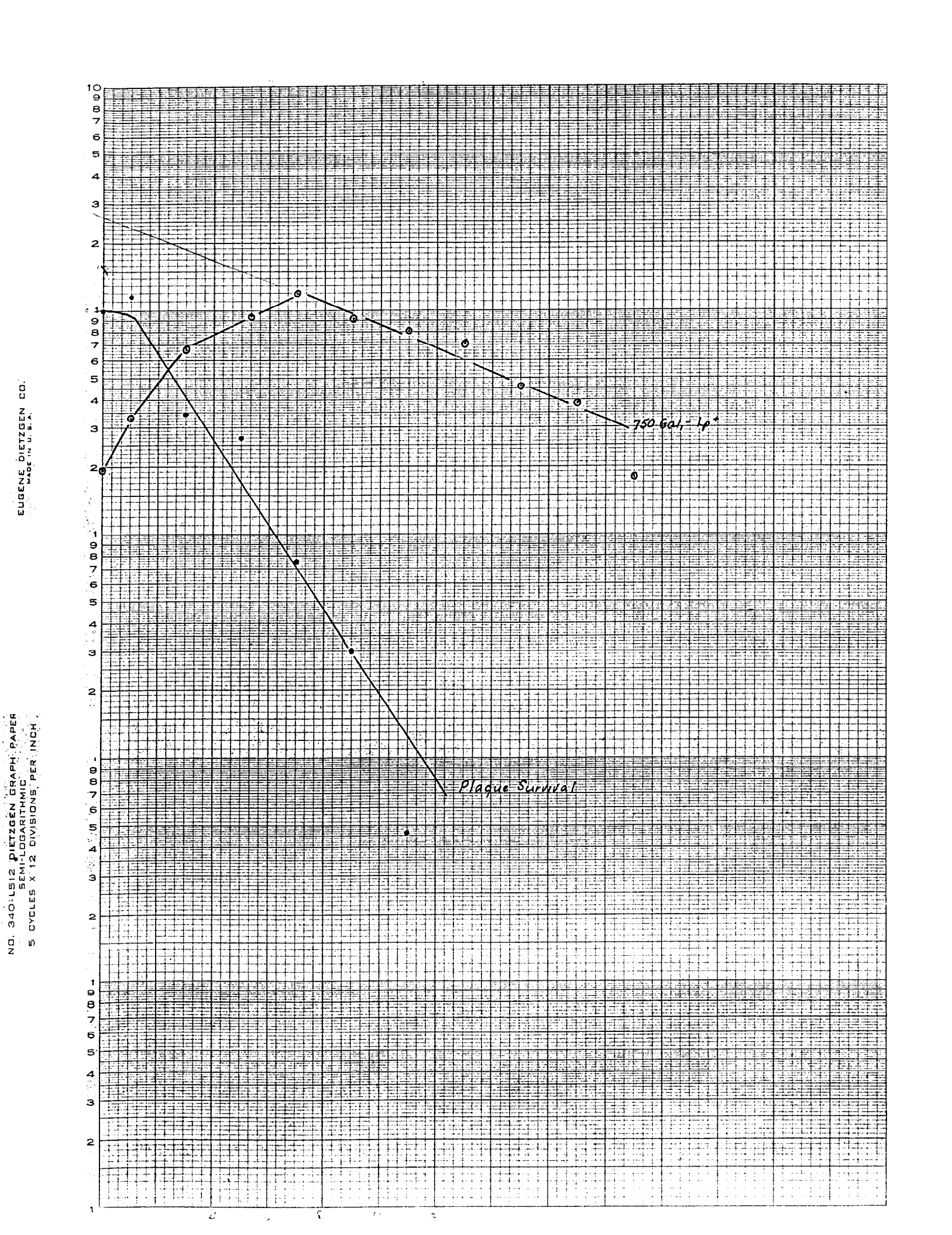
Irrad.	750	2280	2291	518	811	1924	Plaque Assay 518	
0 bkgd	0	2		19	39	28	0	dil = 10 x 10 x 10 x 20
0 (+λ)	~~[illegible]~~ 96	197	Contaminated	36	114	96	437	= 8.74 x 10^6/ml irrad. tube
1	~~[illegible]~~ 166	~~[illegible]~~ 632		77	219	214	497	= 9.94 x 10^6
3	334	632	wet	148	621	438	149	= 2.98 x 10^6
5	470	685		337	774	667	117	= 2.34 x 10^6
7	595	569	(+)	385	922	660	33	= 6.6 x 10^5
9	458	346		327	912	519	13	= 2.6 x 10^5
11	~~[illegible]~~ 403	246		258	634	489	2	= [illegible]
13	358	195		254	553	370	0	
15	226	98		201	394	321	0	
17	191	88		120	278	194	0	
19	87	42		107	217	139	0	

Corrected for bkgd.

		x2		x2		x2		x2		
0	96	192	195	390	17	34	75	150	68	136
1	166	332	~~630~~ 435	870	58	116	180	360	185	370
3	334	668	630	1260	129	258	582	1164	409	818
5	470	940	683	1366	~~602~~ 318	636	735	1470	638	1276
7	595	1190	567	1134	366	732	883	1766	631	1262
9	458	916	344	688	308	616	873	1746	490	980
11	403	806	244	488	239	478	595	1190	460	920
13	358	716	193	386	235	470	514	1028	341	682
15	226	502	96	192	182	364	355	710	292	584
17	191	362	86	172	101	202	239	478	165	330
19	87	174	40	80	88	176	178	356	110	220

λ assay 1485 same dil.
651, 809 1460
~~442, 453 = 895~~
442, 453 = 895
ft. 409
119, 124 = 243
30, 31 = 61

λ Assay 2281 same dil
331, 243 = 574
203, 258 = 461
173, 63 = 236
32, 37 = 69
total = 26



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Inod. HFT λ · N16

1. λ Survival as Plaques			Rel. increase 750	2280
	titer	N_s/N_0	– 1.92×10^7	3.9×10^6
0.	8.74×10^6	1.0	1.0 ↓	1.0 ↓
1.	9.94×10^6	1.14	1.7 (3.3)	2.2 (8.6)
3.	2.98×10^6	0.341 3.41×10^{-1}	3.5 (6.7)	3.2 (12.5)
5.	2.34×10^6	0.268 2.68×10^{-1}	4.9 (9.4)	3.5 (13.7)
7.	6.6×10^5	0.076 7.6×10^{-2}	6.2 (12)	2.9 (11.3)
9.	2.6×10^5	0.030 3.0×10^{-2}	4.8 (9.2)	1.77 (6.9)
11.	4×10^4	0.0046 4.6×10^{-3}	4.2 (8.1)	1.25 (4.9)
13.			3.7 (7.1)	0.99 (3.9)
15.			2.4 (4.6)	0.49 (1.9)
17.			2.0 (3.85)	0.44 (1.7)
19.			0.91 (1.8)	0.205 (0.80)