3/6/53 Friday

Exp. J Examination of gal- prototrophs from cross of 518 X (892) p.177

mixed cultures

Prototroph	~~Stalked~~	811λ-5	842λ-2			Lp Rx	
1. } galt		1st smear	2nd				
2. }							
3.	52	18	s. smear	4-		s	
4.	22 ←3→	153	s. smear		?	lys	J-4-4 8/8 stable after (2)
5.	24* ←5→	42 *	solid smear °	4-		s	
6.	72	347	s. smear °		?	lys	J-6-4 8/8 stable after (2)
7.	44	227	s. smear °		?	lys	J-7-4 8/8 stable after (2)
8.	1 ←→	6	2 s. smear	4-		lys	J-8-4 6/6 stable after (2)
9.	40 ←3→	21	4 s. smear °	4-		s	
10.	41 ←5→	36	6 s. smear °	4-		lys	
11.	37	11	s. smear	4-		s	
12.	23	21	29	Lp₂ R		✓	
13.	1 ←1→	8	2 s. smear °	4-		lys	J-13-4 8/8 stable after (2)
14.	39 ←3→	10	4 s. smear °	4-		s	
15.	2 ←5→	61	s. smear °		?	lys	
16.	77*	211	s. smear		?	lys	J-16-4 8/8 stable after (2)
17.	33	60	s. smear	4-		lys	J-17-4 8/8 stable after (2)
18.	23	1/2:208	s. smear		?	lys	J-18-4 8/8 stable after (2)
19.	2	11	s. smear ●	4-		lys	
20.	1	7	s. smear	4-		lys	J-20-4 8/8 stable after (2)
21.	4	9	14	Lp₂ R		s	
22.	1	17	s. smear ●	4-		lys	J-22-4 7/7 stable after (2)
23.	30 *	35 *	46*	Lp₂ R		✓	
24.	87	12	s. smear °	4-		s	
25.	30 *	18	s. smear	4-		s	

Correlation from smears (6–7)

* small in bkgrd.

14	4-	6/14 s
6	?	
3	Lp₂ R	

(1765)

3/6/53

Transductions

			N. pfu 3 days
811	EMB gal		
	1.	no add	43
	2.	138	122
	3.	D4t750	42
	4.	A3	47
2050			
	1.	no add	16 (+ some small)
	2.	138	1/4 = 110
	3.	D4t750	1/2 = 210
	4.	A3	1/4 = 177
750			
	1.	no add	2
	2.	B8	78
	3.	D4t750	2
	4.	A3	18
2175			
	1.	No add	24
	2.	B8	18
	3.	D4t750	12
	4.	A3	64

Tuesday 3/10/53

518 Transduction with high activity phage -

0.1 ml of saline rescspd 518 cells (overnight culture)
0.9 ml of D1 lysate -1 - Inc at 37 10 min - dil

10^2, 2×10^1 0.1 ml → 10 plates.

	unstable(+)	(-)	total
1	72	1708	1780
2.	83	1/4 = 443 (1772)	1855
3.	77	about the same	
4.	83	" "	" "
5.	89	"	" "
6.	95	"	" "

remainder about the same

24 of these (+) streaked out - all mixed - many mosaic col.

1708) 72.00 = 0.04
6832
3680

c 4% cells transduced

6 plates of 518 unheated dil to contain c. 156 colony / plate showed no plus colonies

1 plate of undiluted 518 also showed no (+)

Extended Examination of prototrophs from 518 × (892) mixed culture - Exp J.
(-) exp 2 days

J 4

1. no add	7	
2. 750 λ-2	22	
3. 902 λ-2	1/8 = 66 528	says its probably gal - ?
4. 892 λ-2	solid smear	
5. 811 λ-5	1/8 = 70 = 560	

J 6

1. no add	c. 50	
2. 750 λ-2	1/8 = 73 = 584	
3. 902 λ-2	1/8 = 87 = 696	says its a new locus
4. 892 λ-2	solid smear	
5. 811 λ-5	1/8 = 68 534	

J 7.

1. no add	21	
2. 750 λ-2	1/8 = 57 456	
3. 902 λ-2	1/4 = 107 428	says its a new locus
4. 892 λ-2	solid smear	
5. 811 λ-5	1/8 = 72 576	

(1775)

3/10/53

1655 (−) gal transduction ~ 892 λ

0.1 ml 1655 saline suspended (aerated ovlt) + 0.9 ml 892-2 λ
- incub at 37 C 10 min dil 10^1, 10^2 → 0.1 ml / 10 plates EMB gal

	tot. no. colon:	no. mosaic col.	
1.	155	5	3.2 % mosaic
2.	294	8	2.7 %
3.	not about the same		

2 plates made to indicate the amt. of phage added to the gal plates indicate about 10^3-10^4 λ / ml

Lysate sterilities

892-2 bottle 1 — sterile 0.5 ml

01-1 0.2 ml sterile

04-2 bottle 1 sterile 0.5 ml

01-2 ~~bottle 1~~ not sterile 0.5 ml. — Re chloroform

1655 (tot 27) 1 mosaic colonies picked and streaked out — no sign of ± colonies evidently ± diction not easily accomplished

3/17/53 Tuesday.

Transduction: To identify prototrophs from 578 x 892

		Rep 2 days
750 EMB gal		
1. no add		4
2. J4		6
3. J7		3
2175		
1. no add		8
2. J4		26
3. J7		30
2050		
1. no add	1/4 = 56	= 224
2. J4	1/4 = 58	= 232
3. J7	1/4 = 41	= 164
4. 892 λ-2 (1-10)	> 2000	
5. D2 (presumed 4- Sey SH4Th)	1/4 = 83	332
578		
1. no add	33	
2. J4	18	
3 J7	23	
4. D2	15	

J4, J7 appear to transduce gal+ - only what this means I don't know

J4, J7

probably says D2 is gal+ altho duction of 2050 is low (hi background?) also this culture is lysogenic for "normal" λ - not hi-act λ

1485 - Attempt to transduce to hi act λ from 892 - Rep 2

0.2 ml 3 resusp aerated cell. c. 10^9 + 0.5 ml 892 λ-2

5 Control plates EMB gal: c. 400 colonies/plate - some intermediate gal+ & possible mosaic colonies - streaked out. On streaking showed + and slow + forms.

5 Eggl Plates EMB gal: c. 80 colonies/plate - represents about 80% killing?
c. 24 mosaic colonies - streaked out
$\frac{0.04}{400/35}$ = c. 4% of the 24 colonies - 1 segregating + on 1st streak

to avoid selection against + (-)

Eggl plates EMB(0): c. 80 colonies/plate -
31 colonies showing evidence of lysis

3/21/53 Sat.

invalid - 892 a mut

Exp K 811 + 892 (-1 segregant analysis)

On EMB gal

Seg #	8w add	892 λ-2 (1-100 dil.)	811 λ-5	Probable locus	
1.	31	c. 2000	33	4	[illegible] from 811λ
2.	21	c 3000	54	(?)	3/8 mucoid 2 4/8 mucoid 3
3.	71	c 2000	68	4	
4.	~~31~~	c 2000	~~33~~ 63	(?)	1/8 mucoid 2 4/8 mucoid 3
5.	26	c. 2000	28	4	
6.	26	c 2000	29	4	
7.	17	c. 1000	59	(?)	4/8 mucoid 2 4/8 mucoid 3
8.	37	c. 2000	32	4	
9.	36	c 1000	73	(?)	
10.	27	c. 1500	31	4	
11.	38	c 1500	48	4	
12.	28	c. 1000	33	4	
13.	24	c 1500	22	4	[illegible]
14.	24	c. 500	54	(?)	6/8 mucoid 2 7/8 mucoid 3
15.	12	c. 1000	45	(?)	5/8 mucoid 2 5/8 mucoid 3
16.	33	c. 1500	19	4	
17. (switched)	47	c. 2000	43	4	
18.	28	c. 2000	21	4	

892 λ on the stability of spontaneous pap - after 2 all appear pure +

Exp + D

instability of D1 spontaneous pap. confirmed (again) 3/8
stability of D4 " " " " 8/8

2050 - from EMC - transduced by 892 λ - 2 to high ~~titer~~ frequency

892 - from EMC - ~~[illegible]~~ lac- - colony) distribution about the same
form) as own 892

- own also lac- ———— small col form + operculum colony form

Sun
Mon: 3/22/53 - 3/23/53

~~518 Perfect phage transduction as a function of multiplicity~~
~~λ - 892~~

~~[illegible]~~ -

892 - streaked out lac EMB - appears homogeneous lac - minus - 2 colony types - small round large spreading. well isolated of each picked, lysates made 892-isol. 1 / 892-isolate 2 } dont know which is which! determine from culture

2050 EML is there lysates
518

cell	lysate - phage	isolate 1 892 lysis? 150	isolate 2 lysis 10
2050 E	c. 3		
518	c. 30	c. 20 no plaques? massive ducts?	c. 2

plaques plus gen lysis - transduction diffused, to areas - massive? streak and see extent of gal + neg { no transduction b'ground (-) in B different areas }

plaques not removed

1-100 dil.
like lysis ← c. 10 pl. 1-5 plaques

results suggest isol 1+2 are gal4 !?

518 + 2050 - 3 (purified) stocks made of separate transduction not a high incidence of transduction 2050 → × 518

3/24/53
Expt L stored in EMB gal plate

518 - one plate - transduced c 892 hi power λ to see if transduced are Mt replica (slightly) to D(o) — no growth D(o) — no prototrophs

3/16/53
Thursday

892 - all confused - probably complicated by a switch in media.
Apparently 892 mixed with gal+, gal− ; possibly (−) of
a couple of types.

578 Examination of 04 to see if activity of 1 present.

1. to add	=	12
2. 04 1	=	$>10^9$

Summary 518tK-12 See pages 170a

page 1. Examination of a single gal- segregant from ~~[illegible]~~ separate transductions of W518 gal4- by lysates of K-12

		Receptor test No. of segs.	No. transd. by gal4- lysates	No. transd. by gal2- lysates	Probable locus by receptor test
170a	A.	22	0	22	22 gal4-

1. (A3)
2. A1
3. A2
4. A3

2. Examination of a number of gal- segregants from a single transduction

		Receptor test No. of segs.	No. transd. by gal4- lysates	No. transd. by gal2- lysates	Probable locus by receptor test
145	A.	15	0	15	15 gal4-

163 B. Cursing test (X1426)

	Seg no.	No. prototrophs	No (+)	Probable locus
1.	A3	975	0	gal4-
	A11	1048	0	gal4-
	A13	c. 1250	0	gal4-

C. Donor Test

	Lysate of Seg	Transducers gal1-	gal2-	gal3-	gal4-	Probable locus
165, 1766	A1	+	+	+	no	gal4-
1766 1.	A3	+	+	+	no	gal4-

Summary of 518 E 902

page

1. Examination of ~~a series of~~ single gal-segregants from different transduction.

2. Examination of a series of gal-segregants from a single transduction

A.

	Receptor test No. of Seg.	No. transd. by gal_4- lysates but not by gal_2-	No. transd. by gal_2- lysates but not gal_4-	Probable locus
146	19	2	17	2 gal_2-, 17 gal_4-

B. Crossing test

1. Seg. gal_2- by receptor test (X 902)

	Seg. no.	No. prototrophs	No. (+)	Probable locus
175	B7	c. 2200	0	gal_2-
	B8	c. 1600	0	gal_2-

2.

C. Donor Test

	Lysate of Seg	Transducers gal_1-	gal_2-	gal_3-	gal_4-	Probable locus
	B7					
176B	B8	+	no	+	+	gal_2 -

76
16
456
76
1216

Sunday 3/29/53

Analysis of 892 mutation

811

892-1 } = 2 (-) gal colonies from stock of 892 - lysate made
892-2 } of these - both are lac- T2R-

811 — Pl? 2 days

1. no add — 28
2. 892-1 — 39
3. 892-2 — 33

} these lysates appear to have at least 2 phages in them - 1 resembling λ, other giving plaques on λ+ cultures!

2175 for the purpose of ~~separating~~ ... of 518 × 902

1. no add - 6
2. K-12λ 30-1 — 176 — pick 24 for analysis

750 For the purpose of picking transductions for analysis - of segregants.

Monday 3/30/51

1. no add — 2
2. K-12λ 30-1 — 1/8 = 18 — 342
3. 902λ -3 — 1/4 = 29 — 116

518 For the same purpose as 750 above

1. no add. — 28
2. 750λ - 2 — 79
3. ~~R~~ 902λ-3 — 1/16 = 76 = 1216
4. K-12λ-30-1 — 1/8 = 65 = 280
5. filtrate of culture of 1485E01 } — 57 ← indicate that if λ from "natural" lysis is not very active - assuming high titers. a few plaques resembling λ-2

518

a second culture to test a lysate of gal + from mutation 892

1 day incub.

1. no add — c 20
2. lysate of 892 gal+ colony & a broth culture of this appeared ... — > 10⁴ — high activity

Monday March 30, 1953

1673X D1 to see if pct (λ+) from this cross have hi-act lambda-purity of the cross structure
D1 I pure-
1673- +, with slow gal present - a plus picked for purif. and a new

4/2/53 Thursday

— 1485tD1 - the negative (+) transduction - Examination of (-) segregants to determine their nature-

Exp. L.

		no pup 2 day	Locus suggested
L1	no add	4	
	902λ-3	19	2⁻
	811λ-6	37	
L2	no add	6	
	902λ-3	5	2⁻
	811λ-6	21	
L3	no add	10	
	902λ-3	9	2⁻
	811λ-6	22	
L4	no add	5	
	902λ-3	5	2
	811λ-6	21	
L5	no add	5	
	902λ-3	8	
	811λ-6	13	2⁻
L6	no add	3	
	902λ-3	7	2⁻
	811λ-6	21	
L7	no add	3	
	902λ-3	8	2⁻
	811λ-6	14	
L8	no add	2	
	902λ-3	3	2⁻
	811λ-6	22	

all these formed Lp⁻/S and prototrophic

Reason for low transduction not known. Data appear ok - but better recheck-

892 hi powered λ - to hi power DNAase susceptible?

578	no add	16	
S	892λ untreated (1-100)	>10⁴	no
	892λ DNAase treated at 37c 10 min 1-100 × 6/5	>10⁴	

4/2/53

518 gal+ - Is there a diff. between 518 gal+ R and 811 gal+ R because 811 was made Lp+ ? Data on 811 reversions as gal+ donors not cleared because strains not transducing gal do not give (+) in crosses with Y-10. Examine 518 gal+ to find strains giving (-) with Y-10, then make lysogenic and examine transducing phage.

<u>Check on the crossing cultures.</u> Y-10 are (+)
518g+-1 " "
518g+-2 " "

518g+-1 × Y-10 - all + prototrophs found
nos/¼ plate = 65, 48, 75, 114, 67, =

518g+-2 × Y-10 - all + prototrophs found
nos/¼ plate = 75, 128, 95, 87, 108

892 mixed stock - plated against A^2 - large proportion of cells Lp_2^R
Selection for Lp^R portion of stock.

2175 EK-12
24 (-) ray obtained - carried thru ② purifications

518E750-1 } were from ② purification
518E750-2 }
750E902-1 } made from ① purification
750E902-2 }
750E12-12-2 } made from ② purif.
750E11-12 - 1 }

April 5, 1953

892(mix) preliminary examination of occurrence of transducing phage in bursts from single cells of irradiated 892

1. Growing culture of 892 diluted to contain c. 500 cells/0.1 ml
2. irradiated 15 seconds.
3. plated before and after with 750, 1485, and by itself.

1. 892 cells/0.1 ml before irrad. = 585 (gal+ = 101)
2. 892 cells - plaques/0.1 ml on 1485 before = 1.
3. 892 cells - transd/0.1 ml before on 750 = 78 (from 892, 78)

4. 892 cells/0.1 ml after irrad 16.8 (gal+ = 26)
5. 892 cells/0.1 ml plaques on 1485 after irrad. ~~117~~ 247 (total = 415)
6. in 892 cells grown on 750 cells 35 (gal+ from 892 = 31) / 750 aparture yielded

750 irradiated = 2

~~~

518 gal+ R #3 X Y-10 controls o.k.

	(+)	(−)
1.	1/4 = 60	240 or more
2.	1/4 = 33	132 "
3.	1/4 = 46	184 "
4.	1/4 = 40	160 "
5.	1/4 = 51	204 "
		930

0(−) / 930 (+)

518 gal+ R #4 X Y-10 controls o.k.

	(+)	(−)
1.	1/4 = 53	1/2 more
2.	1/4 = 57	228 "
3.	1/4 = 50	200 "
4.	1/4 = 58	232 "
5.	1/4 = 55	220 "
		1114

0(+) / 1114 (+)

~~~

1485 EDI — unstable gal+ ⟶ hi lysates ind. λ

save virus ↓ to stable + ⟶ low ind λ

~~~

902 St X 2175 (gal2− X gal1−) on low sm - about 200 recombinants per plate.

2251
~~~

Tuesday 4/7/53

- 1821 - vs. hi powered 892 λ

On EMBgal

7. no add - c 10
8. 892 1/100 - c. 1000? } appears that hi act λ has less act. on 1821 - situation similar to "narrow" λ.

On EMB xgl

7. no add - many small, 3-4 large
2. 892/-1/100 - " " c 10 " }

Repeat xgl using undiluted λ892.

1485 t D1 - Re-examination of the possibility of (-) deletion

1. Lysate D1/d - 2 prep.
2. Cross pushed on 1485 on EMB(o).
3. After 1 day lysed area picked to H₂H - streaked out several times on EMB gal.
4. a single (-) colony observed
   several intermediate gal + col.
   a few segregating (what?) colonies
   many gal + colonies.
5. Some of above colonies picked and streaked.
6. Results
   streaks c
   a. 2 pure (-) col.
   b. several mixed?
   c. mostly gal + col.

Summary Stock cultures on Plates in Refrigerator

- 1924 t K-12 Unstable + 11 in all
- 811 gal + R. 10 in all
- 518 gal + R 8 in all

Expt	A	518 t K-12 all seg single transduction			
"	B	518 t K-12 all seg from single transduction			
"	C	518 t 892 (mix)			
"	D	518 t 892 mix)			
"	E	2050 t 891			
	–				
	–				
	–				
Exp	J				
"	K				
"	L				
"	M	750 pr t K-12	(–) seg	~~18~~ 19 in all	} replaced using heated gel; prototype to make more c̄ 750 s' 902 s' = 2257
"	N	750 pr t 902	(–) seg	23 ~~16~~ in all	}
"	O	2175 t K-12	(–) seg.	21 in all	
"	P	518 t 750	(–) seg	3 in all	
"	Q	518 t K-12	(–) seg	13 in all	
"	R	518 t 902	(–) seg	23 in all	
"	S	811 t 902	(–) seg	19 in all	
	T	2175 t 750	(–) seg	23	
	U	2175 t 811	(–) seg	16 in all	
	V	811 t K-12	(–) seg	20 in all	
	W	1924 t 902	(–) seg	18 " "	
	X	1924 t K-12	(–) seg	24 " "	

4/9/53

1485tD1 - Occurrence of hi-act I in bursts of single cells mod.

Pre mod.

1. 1485tD1 cells arrest pre mod. = 493 /0.1 ml
2. Sp. pop. 750 1
3. No. pg in mix of 1+2. Theoretical Expected 494
4. Plaque by 1485tD1/1485 Found 494 0

Post mod.

5. No. 1485tD1 cells survs. 123
6. No. " cells giving plaque/1485 140
7. No. " cells giving pop. 750 123
" Sp. pop 750 1
Total 124
8. No. pg mod. 1485tD1 on 750 222

No giving 1485tD1 cells giving pop 750 222-124 = 98

Fraction giving 1485tD1 cells giving rise to 1 hi act. particle 98/140 = 70%

4/10/53 Friday:

750 and D1 Occurrence of hi-act-λ in single bursts of D1

C. 10^3-10^4 cells of D1 - sampled before irrad., then irrad $\bar{c}$ U.V. sampled immediately and after 2 hours inc in broth aerated cult. D1

dil to 10^3-10^4 → dil 10 sample → for cells; → for plaques/1485; → for pap / 750
↓ irrad 5 sec, 10 sec. → dil 10 in broth → sample immed. → cell survival; plaques induced; pap 750
↓ inc. 2 hours → sample as ↗

Pre Irrad

		10.1 ml
1. Total no. cells =		310
2. plaques/1485 =		1
3. Pap. / 750	(3)	6

750 sp pap = 1.

Post Irrad.

5 Second exposure.

4. Surviving cells 159
5. plaques induced/1485 40
6. immed. pap /750 (3) 6
7. plaques after 2hrs/1485 3344
8. pap/750 after 2 hrs. — (?) >47 (many small) upper limit = c. 600.

40 plaques / 131 disappearing cells

10 sec. exposure.

9. Surviving cells 84
10. plaques induced/1485 40
11. immed. pap / 750 (3) - 15
12. plaques after 2hrs/1485 2720
13. pap. / 750 after 2hrs (?) 753 (many small) upper limit = c. 20?

Plaque assay against 1485 when streaked out - centr of plaque show evidence of (-) duction

---

812 mix gal+ (also unstable)
lysate has hi act / 518

1485 $\bar{c}$ D1 — (-) seg
lysate probably has hi act /518 but appears quite lytic also.

518 gal+ R. #5 and #6 tested in crosses × Y-10 for mimic revers

518 gt #5 gal+ proto = 420, 650, 522, 416, 266 (all obtained by counting either 1/4 or 1/8 of plate) 2nd gal(-)

< 0/2304

3 mimic col. ? 518 gt #6 gal+ proto: 440, 440, 432, 440, 340, 672 (also obtained by counting 1/4, 1/8 of plate) low (-) proto

< 0/2764

3/10/53
Sat.

Various transductions to secure (-) seg for classification

		pap 2 days	
2175	1. no add	13	
	2. 811λ-4	39	} (-) seg isolations made from both - [illegible]
	3. 811λ-7	50	

~~~

750	1. no add.	2	} discard - transduce gal, - pick instead and use 750-' as crossing tool
	2. 811λ-4	10	
	3. 811λ-5	14	
	4. 811λ-6	33	
	5. 811λ-7	25	

~~~

518	1. no add.	29
	2. 750λ-2	72

~~~

1871 On EMB xyl -

1871 xyl No ductions?

7. no add	3	
2. 892λ-2 (hi powered)	c. 150	on ✓ these are galt xyl - Apparently EMB xyl can select for gal- duction -

~~~

3/16/53 Thursday.

750 Sr = 2319 - test for validity

1. no add		21
2. 750λ-1		25
3. 902λ-3	1/4 107	428

4/16/53

750pr = gal, prototroph - Isolation of (-) segregants

1. no add 1.
2. 750λ-1 0 (check on authenticity)
3. K-12λ 30-1 143
4. 902λ-3 84
5. 811-6 14

after 2 single colony isolations 2/14 are mixed - probably indicates that stable transductions result 811 → 750

Gal₂- 1655 X 2238 (= lac, gal₂-) to isolate Lp_2^S form (Lp^S also if possible)

Control plating
1. 1655 pure +
2. 2238 pure -

cross cells
	(+)	total prototr
3.	30	220
4.	33	211
5.	44	433
	107	864

864) 107.0 = 0.124

+ = 12.4%

Pickings for Lp^S, Lp_2^S or both
1. 5/34 Lp_2^+ all Lp^+
2. 30/30 Lp^+ or Lp^+/λ

750 pr (gal, prototroph) - Irradiation to obtain Lp^S form
5 pink colonies on EMB lac noted. Pick and examine

1871 purifica - try transduction of single colony isolate - Stock made of this
1. no add 10
2. K12λ (30-1) 84

1485 E.D.1 - 2 additional segregants tested

(-) seg #9
1. no add 10
2. 750λ-1 1/4-15 = 60
3. 902λ-3 10
4. 811λ-7 29
} apparently gal₂ -

(-) seg #10
1. no add 8
2. 750λ-1 1/16 = 54 = 864
3. 902λ-3 24
4. 811λ-7 1/32 = 55 1750
x-check } possibly gal₂ -

Saturday 4/18/53

2175 - (attempt to observe "satellite" phenomenon in 2175 [insertion: are the phts secreting something?] found - check to see if other transductions give)

1.	no add	17
2.	K-12 3-1	248

Examination of some lysates

518

	1.	no add		11
	2.	892 Lp_2^+ (enrich)		18
	3.	892 M^+ (enrich)		11
	4.	811/1-8		11
	5.	902/1-4	1/4 = 118	472
unknown (locus effect?) →	6.	015	1/16 = 56	896
	7.	844	1/16 = 44	704

W2346.3

(192)·A

4/25/53 Saturday · (tested by spotting 0.05 ml of 1 drop in each of 3 single plate - 1/2 plate serves as control) (1/2 control) Segregants

Expt. M 750 prototrophic gal⁻ transduced by K-12 λ 30-1 - Examination of Segregants (−)

Segregant	No. of segregant progs. (1/plate)	No. prog. 750 λ - 2 hrs	No. prog. 902 - 4 hrs	Probably forms	To be tested by X	Satellite of gal⁻ λ
1.	7	0	6	gal⁻		0
2.	1	0	10	"	✓	0
3.	4	0	9	"		0
4.	10	0	77	"		0
5.	0	0	11	"		0
6	7	0	7	"		0
7.	0	0	9	"		0
8.	0	0	6	"		0
9.	0	0	8	"		0
10.	0	1	10	"		0
11.	0	0	13	"		0
12.	2	7	9	"		0
13.	0	0	13	"		0
14.	1	0	8	"	✓	0
15.	0	0	10	"	✓	0
16.	0	0	15	"		+
17.	0	0	13	"	✓	+
						2/17

2/24/54

Stocks of this experiment discarded as not worthy of carrying

Examination of lysates M2, M14, M15, M17

	750	518	2175
1. no added	1	40	14
2. M2	3 ok on ✓	29	50
3. M14	5 ok on ✓	62	70
4. M15	4 ok on ✓	15	33
5. M17	5 ok on ✓	28	74

Test crosses of M2, M14, M15, M17 × 750 str - Controls EMB gal⁺ str, 750, M14, M15, M17 ok., M2 no growth

	(+)	(−)		2nd cross	total	3rd cross - Controls ok	total
M2	0(?) ok	128, 89, 115	0+/332	2, 2, 2, 3 = 11	0+/343	21, 16, 14, 13, 19 (83 ok)	16/426
						×2196 gal⁻ : 37, 57, 51, 66, (45)	
M14	0(?) ok	121, 126, 136	0+/383	0, 3, 2, 4 = 9	0+/392	24, 38, 37, 36, 27 = 162	0+/554
M15	0(?) ok	210, 130, 171	0+/511	9, 6, 2, 1, = 18	0+/529	×2196 gal⁻ : 7, 9, 13, 12, 15 contaminated	
M17	0(?) ok	87, 181	0+/268	0, 4, 8, 9 = 21	0+/289	13, 21, 29, 33, 27 = 123	0+/391
				controls ok on 2nd cross X		×2196 gal⁻ : 62, 63, 63, 57, 58	

ok = check

SUMMARY 17 segregants.

by transd. test 17/17 gal⁻

by donor test 4/4 gal⁻

by cross to gal⁻ 4/4 gal⁻ with following mix. prototrophs (332, 383, 511, 268)

source of mix. prototrophs

(192B)

3
SKL 3 4/tow

4/25/53 Sat. 750 pertrograph c 902

Experiment N 750c 902 ⟶ (-) seg Examination - Tested as 750ck12(-)xy p. 192A

Segregant	no. spont. pg. (½ plate)	no. pap 750λ-2 Spot	no. paps 902λ-4 Spot	Probable Locus	Saltate φ	test crosses c 750s^r controls 4/4
1.	0	0	20	gal₁-	0	ok ✓
2.	1.	0	24	1-	0	
3.	4	c. 50	0	2-	– 0	
4.	3	0	32	1-	0	ok ✓
5.	3	48	0	2-	– 0	
6.	0	0	14	1-	++	
7.	0	0	19	1-	0	ok ✓
8.	0	0	25	1-	±	
9.	5	45	7	2-	– 0	
✓ 10.	0 (2)	1 (many small)	14 (17)	1-	±	mix ? ok instab. + of 1-duction confirmed OK SEE BELOW
11.	7	0	26	1-	0	ok ✓
12	4	0	26	1-	0	
13.	0 ~~X~~	0 ~~X~~	13 ~~3X~~	~~X~~	0	
14.	7 ~~X~~	0 ~~3X~~	16 ~~X~~	~~2X~~ 1-	0	
15.	9	60	0	2-	– 0	
✓ 16.	4 (12)	53 (98)	4 (37)	2-	– ±	mix ? ok - instability of + confirmed each duction SEE BELOW
17.	0	7	22	1-	0	
18.	3	1	13	1-	+	
19.	0	0	33	1-	±	
20.	3	0	25	1-	0	
21.	0	0	12	1-	0	
22.	0	1	14	1-	0	
23.	0	0	23	1-	0	

750s^r = ok

5 gal₂- 2+
18 gal₁- 4±
17 0

( ) = 4/26/53

See next page

Crosses

gal₂- seg. x 902S^r on EMB gal SM   2251

						5/4/53 Spot test of Activity of lysates of These Segregants (spot size about) /750	/518	/2175
controls	1. N3 (no + prot. observed)	(-) = 679, 582, 531, 443 = 2135	o(+)/2135	78	52	0
on EMB gal SM - no growth	2. N5 (")	(-) = 369, 280, 274, 359 = 1283	o(+)/1283	79	60	1
on EMB gal - all (-)	3. N9 (")	(-) = 363, 477, 419, 540 = 1799	o(+)/1799	41	46	1
	4. N15 (")	(-) = 454, 529, 479, 466 = 1928	o(+)/1928	44	43	0
	5. N16 (")	(-) = 638, 530, 535, 655 = 2358	o(+)/2358	raised as appear. well. control area ⅛ of plate = 18	raised as appear well c 37 paps control area c. 16	2 control area = 1

N16 ⟶ in λ₂^S (5/4/53)   recovered no (-) = (c.1500) 6 = c.9000

transduction confirmed here by Sbk. ...

5/4 N10 streaked out picked i.e. re gal-duced spot tested /750λ = 0 /811λ = 4 /902λ = 16 - control area 1

5/19/53 (N16 purified not transduced III 3/8) N16 " " " " /750λ = 0 /811λ = 3 /902λ = 0 control area = 0 ∧ Recheck! double(-)? ~~...~~

N16 " " " /750λ = 0 /811λ = 0 /902λ = 0   double(-)? or λp₂^r ?

5/8 Crosses of gal₁- seg x 750s^r (no plus observed)

					state of cross test
controls	1. N1	31, 26, 34, 23 = o+/114	streak check on all susp. + colonies showed all gal 1-4	8, 3, 6, 1 = 18	o+/132
ok.	2. N4	21, 28, 11, 28 = o+/88		7, 4, 1, 3 = 15	o+/103
	3. N7	39, 66, 38, 35 = o+/178		5, 3, 7, 8 = 23	o+/201
Skip	~~4. N10~~	~~50, 33, 41, 52 = o+/176~~			
	5. N11	32, 20, 13, 40 = o+/105		5, 3, 1, 1 = 10	
	6. N16	37, 33, 25, 44 = o+/139		3, 2, 2, 2 = 11 controls ... N1, N4, N16, 750	~~o+/150~~ o+/160

Activity of gal₁- lysates above 5/9/53

	spotted 750	spotted/2175	spotted/811		1-100/750 spot	... 1-100/2175 spot plate	... 1-100/811 spot plate	... 1-100/gal spot plate
N1	0	solid smear	solid smear	does this indicate gal-λ's inact? (see)	= bkgrd.	½ of 92 = 736	c. 500	c. 300
N4	0	15	15		—	—	—	—
N7	0	solid smear	solid smear		= bkgrd	½: 73 = 580	c. 500	c. 300
N11	0	11	11		—	—	—	—
	control = 0	control = 1	control = 2		control a little high	control 19	control 27	control 19

N16 ...

Expt. N continued

N16 plate = original plate stock

6/26/53 N16 - single colony isolation - ~~[illegible]~~ referred to as N-16 "original" or "pure" stock as

lysate (pure, original, labelled)

original	1. ~~[illegible]~~	control	~~[illegible]~~
/750	0(?)	0	
/2175	0	2	
/2238	c. 10	c. 10 ← not likely to be successful 2238 lp?	
/811	c. 7	c. 7	

N16 original	transd	control
/750 λ	0	0
/902 λ	0	1
/2238	0	1
/811	0	4
/K-12	0	4
/892 galt	solid smear	4

← this lysate also fails to transd 1485 → (-)

1/14/56 indicates N16 LFT only is 1-2-?

N16 "plate" - because s.c. of N16 plate suspension as lysate gave no transd. and was not transd. by anything but 892 galt - (This repeated) - lysate of stock plate inoculation was made.

N16 "plate" 2

/811	solid smear	control = c. 5
/2175	0	1

— stock of this showed +, gave faint growth D(0) hi act. reconfirmed.

Additional crosses gal₁ - × 2251

7/6

N7 1 plate = 1432 × 4 = c. 4300 (-) no (+)
N4 1 plate = 844 × 4 = c. 3376 (-) no (+)
N1 1 plate = 2696 × 4 = c 10,800 (-) no (+)
N11 1 plate = 1640 × 4 = c. 6560 (-) no (+)

Additional crosses gal₂ - × 2251

N3 1 plate = 2660 × 4 = >10640 total >12,775
N5 1 plate = 994 × 4 = >3976 total 5359
N9 1 plate = 1484 × 4 = >5936 total = >7735
N15 1 plate = 968 4 = >3872 total >5900

Galt reversions obtained of ~~K12~~ 811

N1 - 1 non HFT
. 2

N7 - 1 non HFT
2
3

9/16/53 N16 lysates of 30', 40', 60' exposure don't show a great deal of diff. All HFT

Monday 4/27/53

750 prototrophs x 1436 on EMB gal SM

1.
2.
3.
4. } all plates barren - Control streaks on EMB gal show pure (-)

1924 transduced C 01 λ - Observation to see if any plaques present - an indication of the new phage in lysates of 892 gal+ a mix

1. no add 1f
2. 01λ-1 (10^{-4} dil.) 1/4=64. ~~256~~ 238 × 10 × 10^4. 2.38 × 10^7 transductants/ml lysate

2238 × 1655 - gal$_3$ - 4p$_2$ prototrophs.

1. no add	64
2. 750λ-2	199
3. 902λ-4	123
4. 811λ-8	156

2347
750 prototrophic gal$_1$

1. No add	5
2. 811λ-8	8

2319
750 s^r =

1. no add	29 a spontaneous? - high for gal$_1^-$ - why the change?
2 811λ-8	128

750

1. no add	3
2. 811λ-8	10

4/24/53 Friday -

Lysate checks: On single plates - 0.05 ml lysate added (spots)

518	1. no add sector	2	
	2. 2238 1-4 spot	4	grow lysate - aeration stopped intermediate - may contain new phage actn on tp+
	3. 2175 1-4 spot	109	
	4. 750 pr "	3	
	5. 750 sr "	3	
750.	1. no add sector	0	
	2. 750 pr spot	1	
	3. 750 sr "	0	
	4. 2175-4 "	148	
	5. 2238 "	2	
2175	1. no add sector	4	
	2. 2238 spot	7	
	3. 2175 "	0	
	4. 750 pr	10	
	5. 750 sr	16	

~~= WL 314~~

Cal 4 - gal 4 - pr+ x 750 sr on EMS gal SM both F+ in cross?

1. Control resp. - no growth EMS gal SM
   - pr+ (-) on EMB gal

X plate	(-)	(+)	total	
1.	5		5	
2	12	0	12	
3	21	0	21	0(+)/54
4	16	0	16	
			54	

~~= WL 2319~~

750 pr. x 750 sr (both probably F+ in cross
EMS gal SM

1. Controls - no growth } both EMS gal SM
   - both (-) on EMB gal

2. X plate.

(+)	(-)	total	
0	42	42	
0	35	35	0/140 ?
0	30	30	
1?	32	33	
		140	

↑
Hm ✓

5/2/53 Saturday

750 t 811 - (-) seg 1 Examination

1. no add - 7
2. 750λ-2 4
3. 811λ-8 10

} no decision possible -

750pr - For the purpose of making transduction of 750 by gal₄- to observe segregant (-)

1. no add. 3
2. 811λ-8 12 ← pick and look for unstable

811 - For the purpose of making transduction gal₄- by gal₁- to obs. segregant (-)

1. no add 51
2. 750λ-2 96 ← pick and look for unstable no unstables [illegible]

5/4/53 Monday -

750pr - For the purpose of making transduction of 750 by gal₄ -
Spread plates

1. no add 3
2. 811λ-8 3
3. 811λ-8 2
4. 811λ-8 1

} again! no success

5/4 → 5/7 confusion about gal EMB - due to new lot?

2175 ductions that partly nullified by part of medium

17/72 gal seg came out + on med. restreaking of these showed one to be gal -

5/7/53 gal₂ -

Expt. O 2175" t K-12 gal (-) segregants.

Segregant	No. ~~spread~~ ~~prot.~~	No. prop. 902A4 spot	No. prop. 811A-8 spot.	Probable locus
O1	~~1~~	0	11	2⁻
O2	0	0	4	2⁻
C3	contaminated			—
" 4	10 0	1 1	13 12	2⁻
" 5	6 0	1 0	17 4	gal₂⁻
" 6	1 0	0 0	12 18	2⁻
" 7	11 0	0 0	13 14	2⁻
" 8	8 0	1 1	13 6	2⁻
" 9	← not spread →			—
" 10	2	1	12	2⁻
" 11	1	0	13	2⁻
" 12	0	0	6	2⁻
" 13	0	0	15	2⁻
" 14	0	0	4	2⁻
" 15	0	0	9	2⁻
" 16	0	0	10	2⁻
" 17	1	0	9	2⁻
" 18	0	0	10	2⁻
" 19	0	0	11	2⁻
" 20	0	1	7	2⁻
" 21	0	0	13	2⁻
" 22	0	1	10	2⁻

20/20 2⁻

Test Crosses - (-) Seg x 902 Sr (2251) in EMS gal SM - control streaks on these EMB gal-OK

	total prots	fraction (+)	2nd cross total prots	(+)	Grand total prots	(+)
03	162, 154, 89, 95, 130 = 630	0/630	604, 608, 566, 796, 866	0	4070	0
05	139, 167, 162, 161, 128 = 757	0/757	1248, 1064, 964, 1092, 1016	0	5384	0
011	66, 78, 67, 47, 77 = 336	0/335	237, 228, 400, 416, 456, 8	0	~~2072~~	0 now 0/4235
014	278, 201, 242, 318, 284 = 1323	0/1323	1059, 1328, 1332, 644, 1296	0	6988	0
					22,677	

011 x 2251 - 2nd cross
569, 861, 733 = 0/2163

Lysates	/ 811	2175 /	locus ~~gal~~
03	c. 15	0	
05	c. 50	0	
011	c. 50	0	
014	c. 30	0	
no add	2	0	

2/24/54 Strains of this experiment discarded as not worth saving

5/9/53 Sat.

Various 'ductions for the purpose of obtaining seq. for classification

2175

1. no seed	16 15	
2. 811 + 8	32	— 3/24 unstable after 2 streakings
3. 750 1 - 2	50	— 4/21 unstable after 2 "

Hfact. 1 - Anti serum test.

Hfact 1 = 01 - dil 1-100 of 01-1 c. 10^{10} /ml

1-100 = 10^8 ml (Pre-test) → phage assay - dil $10^1, 10^2, 10^3$ $\xrightarrow{0.1\text{ml}}$ (10^6 dil) = 35,24 = 2.95×10^7

'duction assay - 0.1ml → 1/4 = 272 2176

+ { 0.5 ml ; 0.5 ml 1-100 Anti P ; incubate 37C for 10 minutes }

2176 · 10 · 10 · 10^2

2.2×10^9

(post-test) → { phage assay - dil 1/10, 1/5, 10^2 $\xrightarrow{0.1\text{ml}}$ (10^5 dil) = 206,254 = 2.30×10^7 ; 'duction assay 0.1ml → 1/4 = 213 852 }

to equate to pre cmc multi. X 2 = 1704

Fract. phage survivors = $\frac{2.30 \times 10^7}{2.95 \times 10^7} = 0.78$

Fract. phage survivors = $\frac{1704}{2176} = 0.78$

$\frac{2.2 \times 10^7}{2.95 \times 10^9} = \frac{1}{1.3 \times 10^2}$

2/24/54 Stocks of this experiment (198) discard. (in poor shape AL..)

5/14/53

Source of dilution: pg 191

Expt. R - 518t 902 (-) seg. tested by spotting ē 902λ-4, 841λ-8.

Seg	Control Spot area	902 spot	811 spot	Probable locus	
R 1.	0	0	13	2-	✓
2.	1	7	1	4-	✓
3.	0	10	0	4-	✓
4.	0	1	9	2-	✓
5.	0	14	0	4-	✓
6.	0	4	2	4-?	4pt. not gal₂ See below
7.	contaminated ē (+)				
8.	1	10	1	4-	✓
9.	1	11	1	4-	✓
10.	contaminated with (+)				
11.	0	13	0	4-	✓
12.	0	17	1	4-	✓
13.	2	11	0	4-	✓
14.	0	14	0	4-	✓
15.	1	20	1	4-	✓
16.	2	15	2	4-	✓
17.	1	0	14	2-	✓
18.	1	8	2	4-	✓
19.	0	8	1	4-	✓
20.	2	15	7	4-	
21.	1	12	1	4-	
22.	0	6	0	4-	
23.	0	18	0	4-	

3 2-
18 4-

Lysates of Gal₂ - R1, R4, R17

	Spotted 841	/2175
R1	c. 70/2	1/0
R4	c. 60/2	0/0
R17	c. 80/2	0/0

Lysate test. (looking for λi act. d gal₂ variety)

	1/2175	1/2811	locus
R2	18/1	0/4	4-
R3	33/8	26/42	4-
R5	83/8	34/42	4-
R8	67/8	34/42	4-
R9	16/1	0/4	4-
R11	8/1	0/4	4-
R12	17/1	2/4	4-
R13	6/1	1/4	4-
R14	14/1	2/4	4-
R16	11/1	1 0/1	4-
R18	5/1	2/1	4-
R19	2/1	1/1	4-
R20	3/0	3/4	4-
R21	7/0	1/4	4-
R22	7/0	2/4	4-
R23	5/0	0/4	4-

In these cases mix equal + lysate pop/control pop. (R3, R5, R8)

others spot test, no pop. spot/control pop.

7/21 R7 non HFT against 2175, 750

not in 1st lysate (R19)

16

2+ 4- 4p+
2- 4+ 4p+

of (+) recombinants 12/15 λs

4p — 2 — 4 or 8 — 4p — 4

Crosses. Gal₂ - X 2251

1. controls R1, R6, R17, 2251 on EMB gal - pure. only 2251 grows on EMB lactose
R1 = 1st 104, 99, 117, 39, 110, 126 = 0+/595 } 0+/1988
7/6/53 2nd 368, 438, 348, 247
Ignore not needed { R6 = 1st 147, 175, (225) 127, 108, 109 = 1+/891 } NOT gal₂ - c 5000
2nd 152, 136, 318, 444 also crossed 1436
R17 = 1st 83, 41, 76, 78, 113, 85 } 0+/1187
7/6/53 2nd 221, 107, 231, 152

2. gal₂ - X 1436
7/6/53 R1 1+/1116, 2+/873, 2+/837, 2+/276 = 7+/3102 = 0.22 [4/7 λs] [8/8 stable in strk]

R17 - 6+/1063, 892, 554, 3+/511, 1+/344 = 10+/4364 = 0.228% [6/8 λs] [8/8 stable strk]

3. Gal₄ - X 1436 - controls o.k.
R2 - 4 plates one counted - 696 total c. 0+/2786
R3 - 5 " " " - 538 " 0+/2675
R5 - " " " 697 " 0+/3485
R8 - " " " 368 " 0+/1840 } 0+/5952
7/6/53 1028 0+/4112

4. Gal₄ X 902 - controls
3+/3 stable on strk R2 885, 583, 1+/740, 1+/610, 1+/365 = 3+/3183 = 0.094%
2/2 " R3 800, 679, 1+/563, 1+/625, 804 = 2+/3471 = 0.057%
11/11 + stable on strk corrected R5 4/849, 2/1513, 4/2361, 4/1441, 7/703 = 19+/ 53 ... = ... 0.35%
1/1 stable on strk R8, 788, 269, 369, 585, 1+/254 = 1+/1665 = 0.06%

19+/1 ... = 0.21%

5/16/53 Saturday.

Effect of anti λ serum on hi-act λ -

anti serum = anti P1
hi-act λ = D1 dil 1-100

plaque assays against 1485
'duction assays against 750

Experimental

antiserum dil 1-10 → 0.2 ml
1-100 dil D1-1 → 0.2 ml
incubate 10 min at 37C

→ 1-100 → duction assay
→ 1-10, 1-5, 1-100 → 0.1 ml 313 plaques, 285 "
ave 299 plaques.
surviving plaque titer = 2.99×10^7

duction assay: 123, 139; ave. 131
duction assay: c 1000

surviving duction titer = $131 \times 10^5 \times 2 = 2.62 \times 10^5$

PRE-ASSAYS

λ plaque assay dil 1-100, 1-100, 1-10, 0.1 ml → 75 plaques, 63; ave 69
titer 1-100 dil = 6.9×10^7/ml

gal duction titer → 0.1 ml = 709 'duction, 608 "
ave 6.58×10^5 ductions/ml

$\frac{6.58 \text{ duct/ml}}{6.9 \text{ plaques/ml}}$ = 1 duction/100 plaques

Plaque survival = $\frac{2.99}{6.90}$ = 0.433

'duction survival = $\frac{2.62}{6.58}$ 0.398

---

750 X 902 to assess amt of recombination between parental suspensions of ol in EMB gal

Cross plates.

1.	296 (-); c300	1(4)
2.	c. 300	0
3.	c. 300	1(4)
4.	"	0
5.	"	0
	c. 1500	2

↖ a minimum no. since there were many small (-) appearing colonies not counted

2/1500 = c. 0.13 %

Recombination between the various gal -

Ref.		% Recomb	no prototrophs	
above	1. $gal_1^- \times gal_2^-$	0.13	c 1500	
	$gal_1 \times gal_2$	0.13	c. 1600	
p. 171, 174, 175	2. $gal_4 \times gal_2$:			
	578 x "	0.38	1289	
	811 x "	0.07	1365	
	3. proto $gal_3^- \times gal_1$ -	1.9	54	0.3-0.6
	1486 x 750	0.13	4588	
	4. $gal_3^- \times gal_4^+$			

(200)

5/18/53 Monday.

81 vs lysate of 2277 2278 - cultures of 1485 lysogenic for 892 1

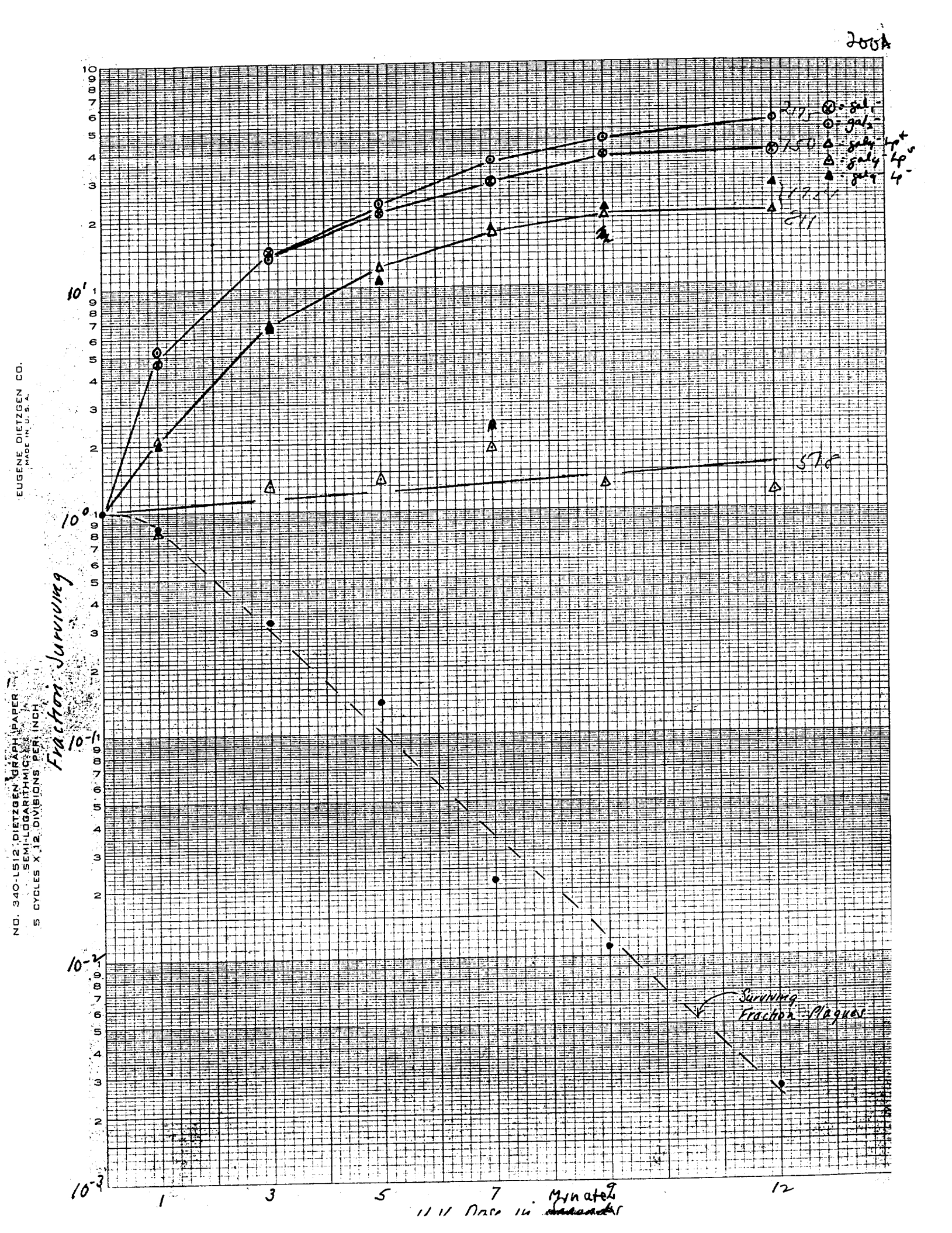
1.	no add	42	
2.	2277	52	plaque $c\ 10^3$
3.	2278	6	many plaques $c\ 10^4$

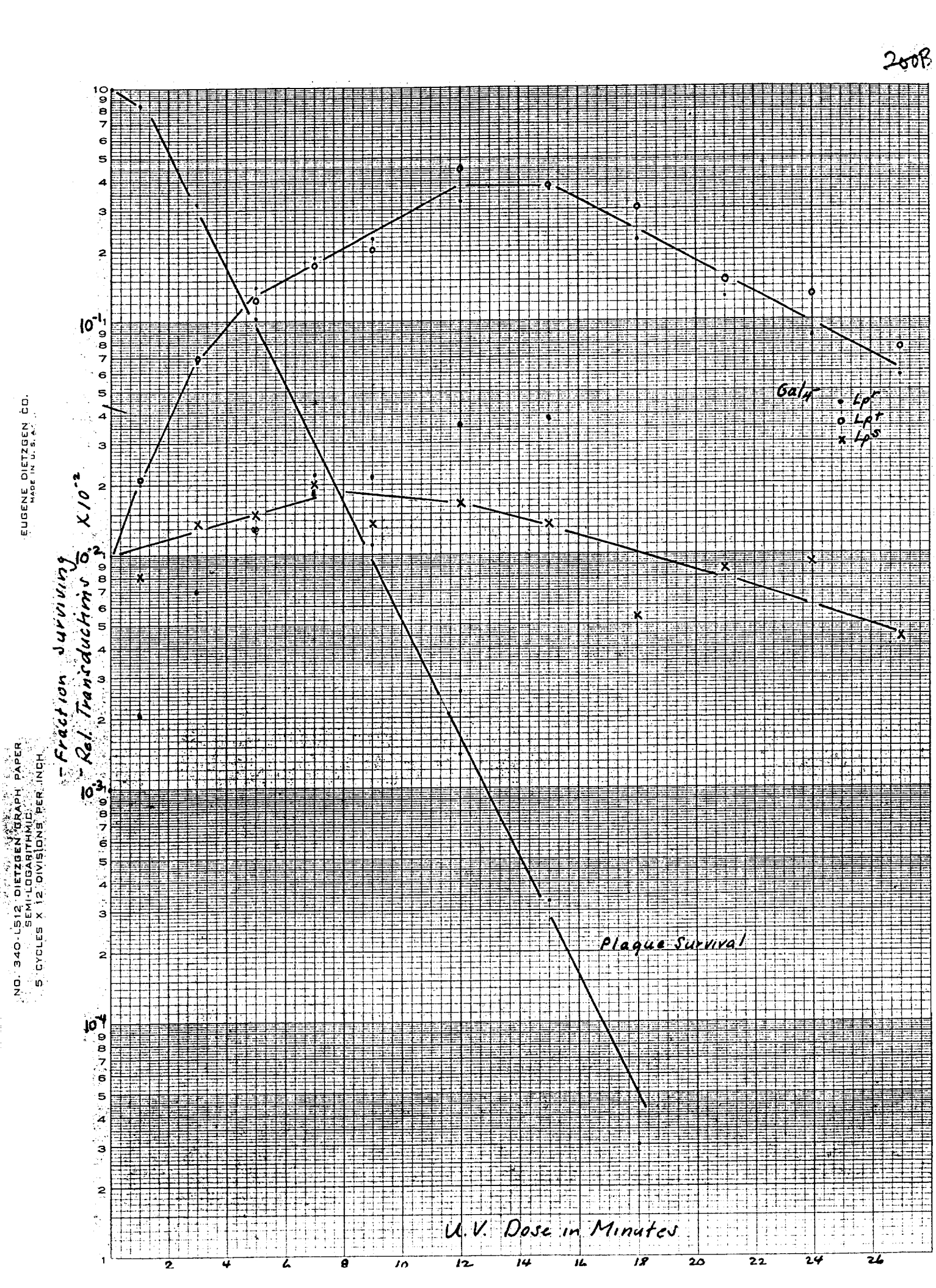
5/25/53 Monday.

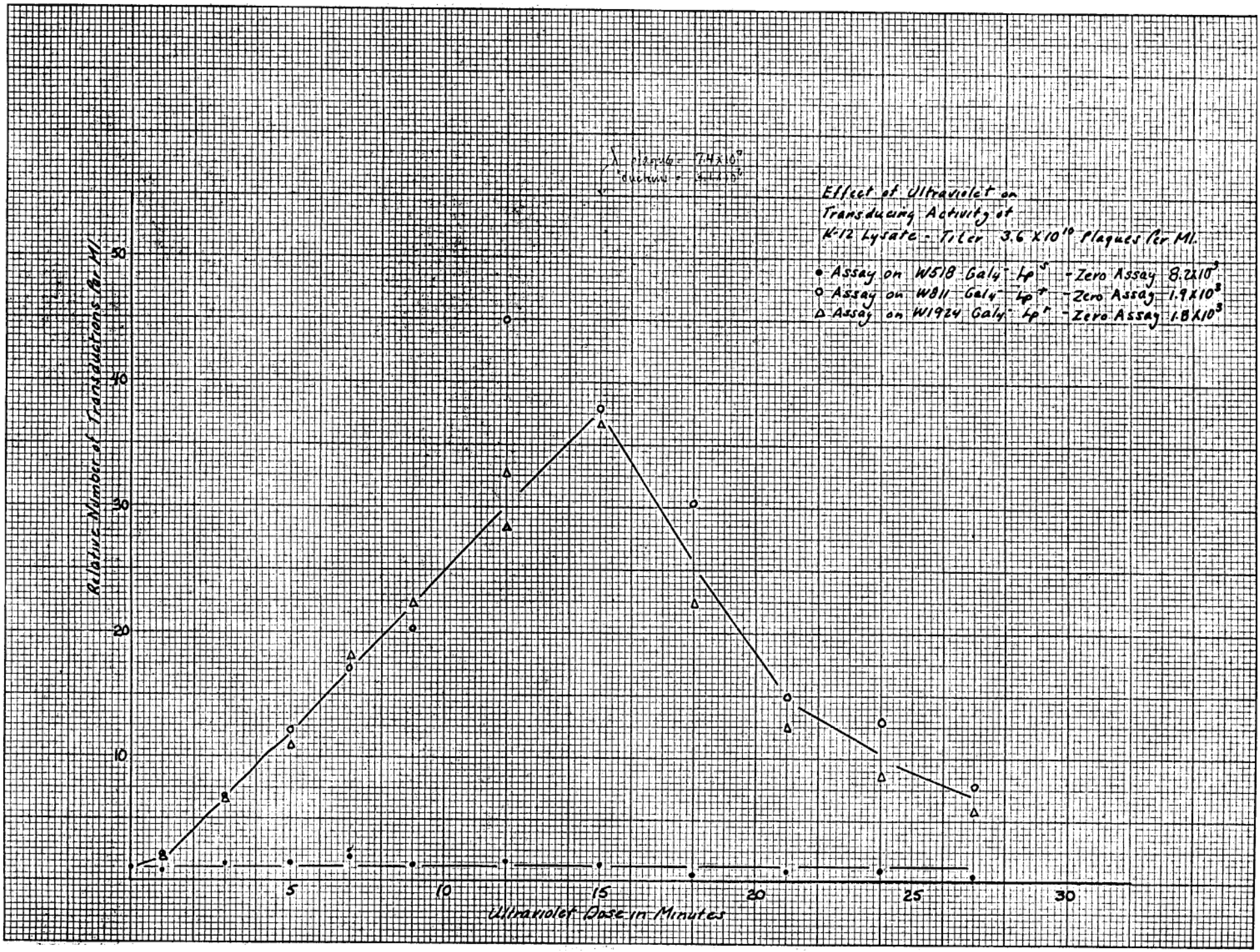
750 X 2238 to obtain double mixed lysate.

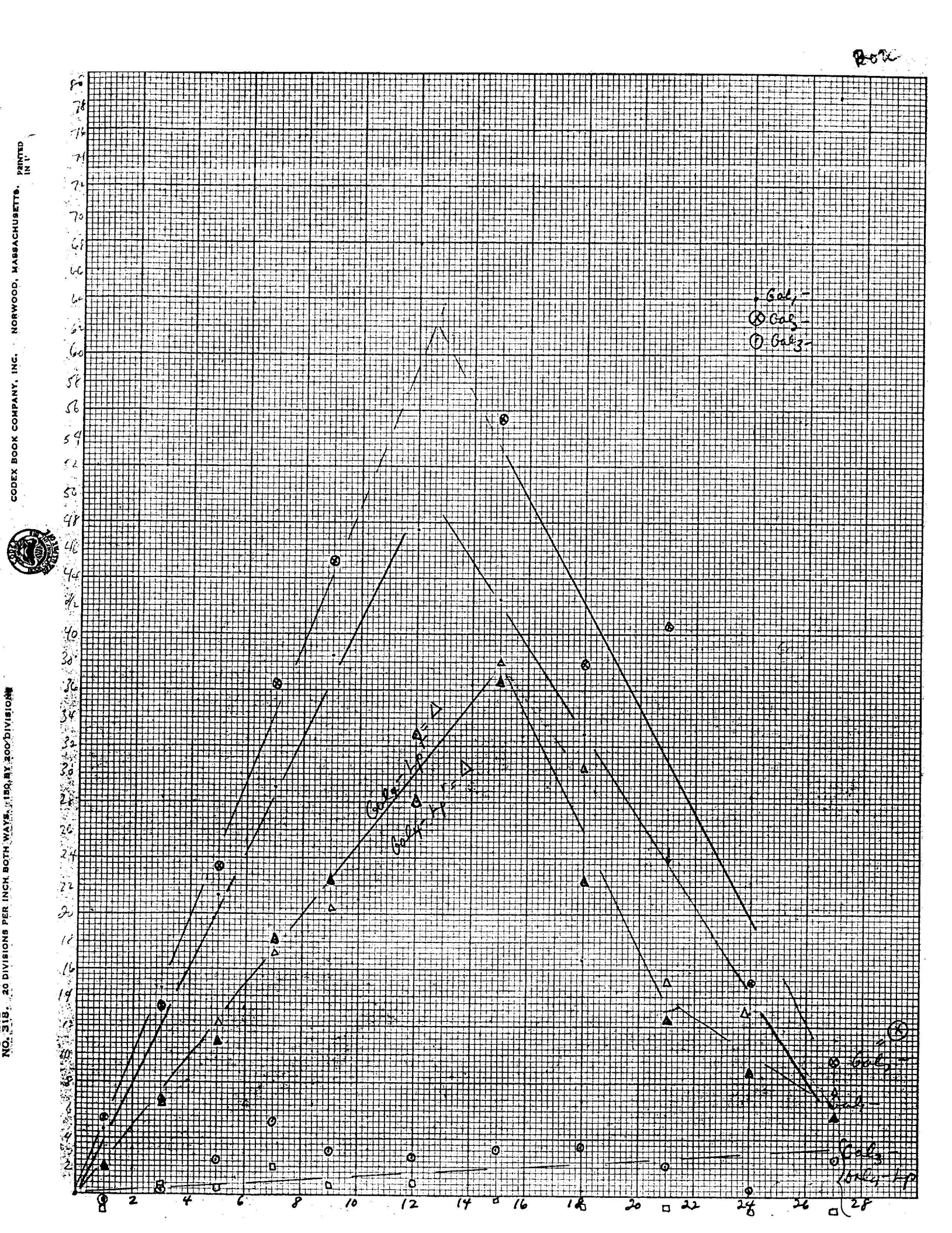
	(+)	titer
1.	2+	c. 400
2.	0	c. 400
3.	0	c. 400
4.	0	c. 400
	2	1600

$\frac{0.00125}{1.}$ = 0.13%









Lysate K12 5/30 2000

No's of papillae/ml lysate

Irradiation of K-12 λ - Effect on Induction

Irradiation	W750 +λ 3 (4)	-bkgrd	ratio	W2175 +λ 9 (14)	-bkgrd	ratio	(1-10 lie) W2297 +λ 6 (12)	-bkgrd	ratio
control-bHK	—	—	—	—	—	—	—	—	—
control + 0 dose	89	86	1.0	83	74	1.0	43	370	1.0
1 min	410	407	4.7	401	392	5.3	39	330	0.89
3 "	1257	1254	14.5	1006	997	13.4	49	480	~~1.3~~
5 "	2034	2031	21.2	1641	1632	23.4	82	760	~~2.3~~
7 "	2512	2509	29.1	2706	2697	36.4	185	1790	5.4
9 "	3306	3303	38.4	3356	3347	45.2	109	1080	3.1
12 "	3420 (1/10 dil = 413)	4100	47.6	405 (1/10 = 60)	6011	81.4	97	910	2.7
15 "	368	3640	42.3	424	4100	55.5	119	1070	3.3
18 " 1/10	277	2730	32.9	294	2800	37.9	131	1190	3.6
21 " dil.	243	2390	27.8 1/10	313	2990	40.5	82	700	2.1
24 "	116	1120	13.0 dil	115	1100	14.9	58	460	1.4
27 "	55	510	6.0	84	700	9.7	102	900	2.7

Irradiation	W518 Lpt +λ 19 (41)	-bkgrd	ratio	W811 Lpt +λ 32 (36)	-bkgrd	ratio	W1924 Lpt +λ 44 (49)	-bkgrd	ratio
control bHK	—	—	—	—	—	—	—	—	—
control + 0 dose	835	816	1.0	226	194	1.0	223	179	1.0
1 min	686	667	0.82	443	411	2.1	392	358	2.0
~~3~~ min	1118	1099	1.35	1369	1337	6.9	1264	1220	6.7
5 "	1182	1163	1.4	2409	2377	12.2	1996	1952	10.9
7 "	1680	1661	2.04	3384	3352	17.2	3296	3252	18.1
9 "	1108	1108	1.36	3977	3945	20.3	4059	4015	22.4
12 " 1/10 dil	1060 (32)	1320	1.62	(4036) 878	8724	45.0	5744	5700	32.96 28.4
15 " 15	115	1150-41=109 740	1.36 0.91	776	7400	38.0	1/20 330 6600 (49)	6551	36.6
18 " 8	48	450-41=939	0.54 0.086	626	5900	30.4	201 4020	3971	22.2
21 " 1/50	74	740-93=699	0.86 1/10	308	2920	15.0	114 2280	2231	12.5
24 " dil	79	790-95=749	0.92 dil	290	2540	13.0	79 1580	1531	8.6
27 " 27	40	400-41=359	0.44	186	1500	7.7	54 1080	1031	5.8

(10^5 plaque) (2.3×10^4 plaque)

$$\frac{1300 \cdot 10 \text{ d/ml}}{1.6\times10^{3}\ \lambda/\mu\text{g}} = \frac{1.3\times10^{4}}{1.6\times10^{3}} = \frac{12}{1.6}$$

at 12

$$\frac{8724\times10 \text{ d/ml}}{1.8\times10^{3}\ \lambda/\mu\text{g}} = \frac{8.7\times10^{3}}{1.8} = \frac{87}{1.8}$$

8724
4036
12760 = 6380
2

226 | 4360 (25) 502 1360

226 | 4036 (19) 226 1770 1552

K-12 λ 5'30

Irradiation of K-12 λ - plaque survival

Dose	dilutions	plaque counts	titer	survival
0	$10^7 \xrightarrow{0.1}$	357, 370	364×10^{10}	1.0
1	$10^7 \rightarrow$	337, 282	3.10×10^{10}	8.5×10^{-1}
3	$10^7 \rightarrow$	122, 114	1.18×10^{10}	3.2×10^{-1}
5	$10^6 \rightarrow$	548, 506	5.27×10^9	1.4×10^{-1}
7	$10^5 \rightarrow$	853, 749	8.00×10^8	2.2×10^{-2}
9	$10^5 \rightarrow$	202, 612	4.07×10^8	1.1×10^{-2}
diluted 1-10 routinely	$10^4 \rightarrow$	1033, 897	9.65×10^7	2.6×10^{-3}
	$10^5 \rightarrow$	69, 36	5.3×10^7	1.4×10^{-3}
15	$10^3 \rightarrow$	103, 140	1.22×10^7	3.3×10^{-4}
18	$10^3 \rightarrow$	18, 3	1.1×10^6	3.0×10^{-5}
21	10^2	6, 6	6.0×10^4	1.4×10^{-6}
24	10^2	0		
27	10^2	0		