More

Exp I (1)

U.V. 10/5/51 Culture R (811)

Diluted culture from — hour unaerated culture. 0.C. aerated — hours at 37C. Prob. titer 1.5×10^8. Diluted 1:10.0 with Penassy broth blank. 11 ml vol. Shelter set at 30 -

Dose (Sec.)	Dilutions	Plates	Approx Col. Count	Titer	Survival
✓ 0	100, 10 →	R-0-4	300	3×10^7	1.0
✓ 20	100 →	R-20-3			
	↘ 10 →	R-20-4	400	4×10^6	0.133
✓ 40	100 →	R-40-3			
	↘ 10 →	R-40-4	400	4×10^6	0.133
✓ 60	100 →	R-60-3			
	↘ 10 →	R-60-4	30 *	3×10^5	0.10
✓ 80	100 →	R-80-3			
	↘ 10 →	R-80-3			
	↘ 10 →	R-80-4	150 *	1.8×10^6	0.06
✓ 100	10 →	R-100-2			
	↘ 10 →	R-100-3			
	↘ 10 →	R-100-4	10 *	1.0×10^6	0.03

* one lysed colony -

More (2)

U.V. 10/5/51 Culture S (518) Expt I

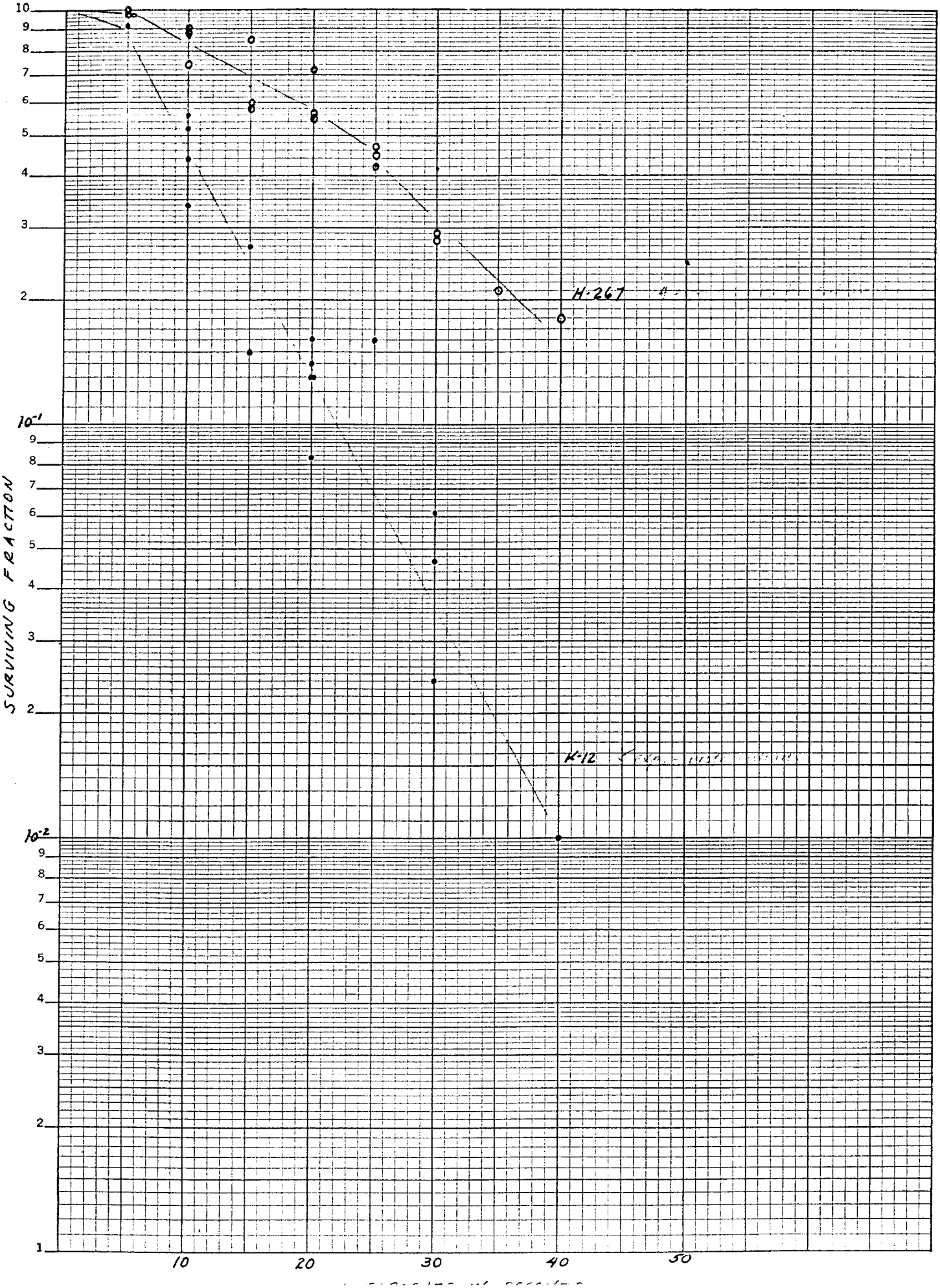
Diurnal culture from ____ hour macerated culture. 1.C aerated ____ hours at 37°C. Prod. Titer 1.5×10⁸. Diluted 1+100 with Penassay Broth - final vol. 11 ml volume shaken @ 30

Dose in Seconds	Dilutions	Plates	Approx. Col. Count	Titer	Survival
~~1×10⁶~~ ✓0	100, 10	→ S-0-4*	500	5×10⁶	1.0
✓20	100	→ S-20-3	~~400~~		
	↘ 10	→ S-20-4	400	4×10⁶	0.8
✓40	100	→ S-40-3			
	↘ 10	→ S-40-4	900	9×10⁶	0.8
✓60	10	→ S-60-2			
	↘ 10	→ S-60-3	300	3×10⁶	0.6
✓80	10	→ S-80-2			
	↘ 10	→ S-80-3	2500	2.5×10⁶	0.5
✓100	10	→ S-100-2			
	10	→ S-100-3	200	2.0×10⁶	0.4

* dilution = 10^4

S-20-4

S = sensitive; 20 = exposure seconds; 4 = dilution



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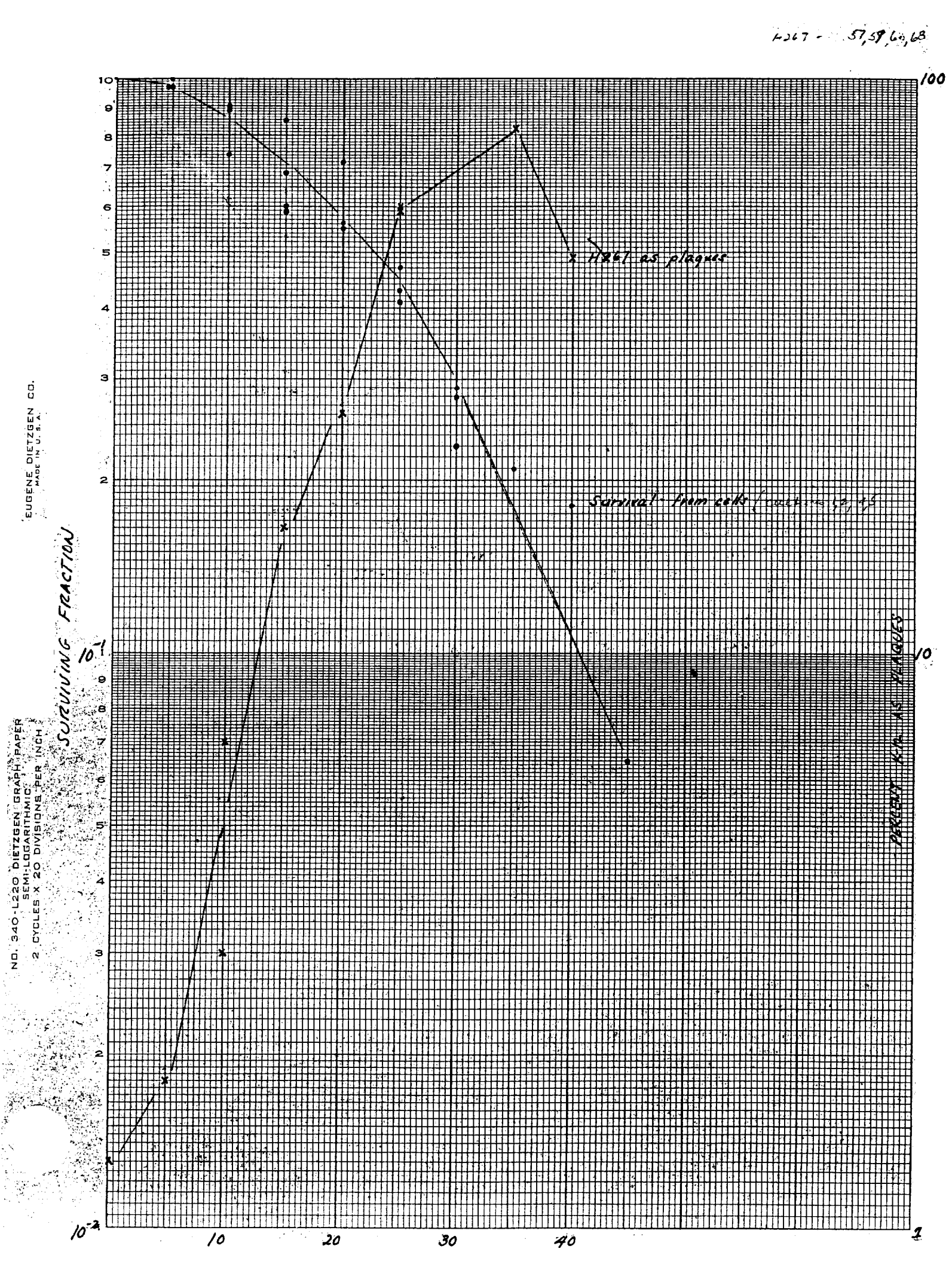
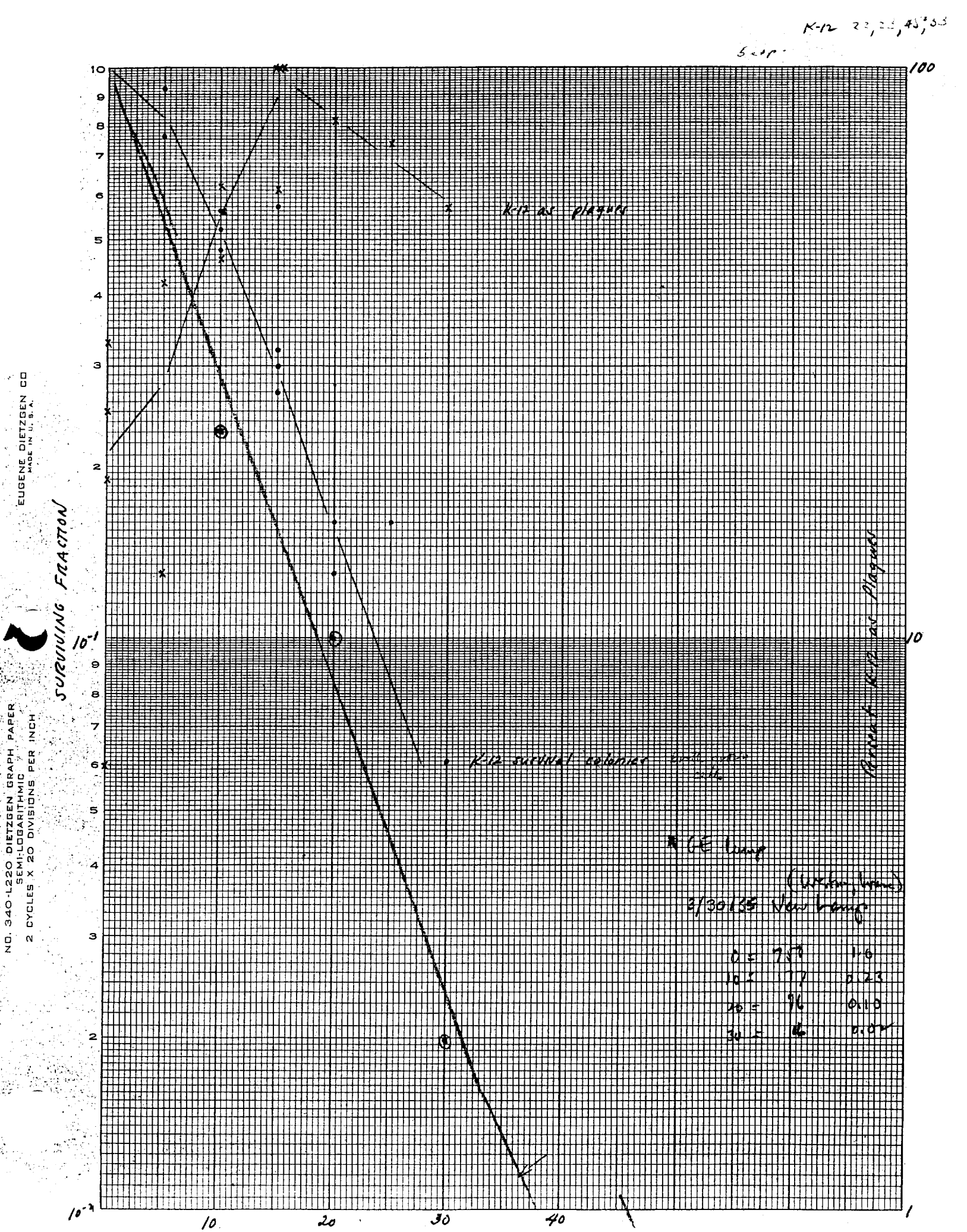
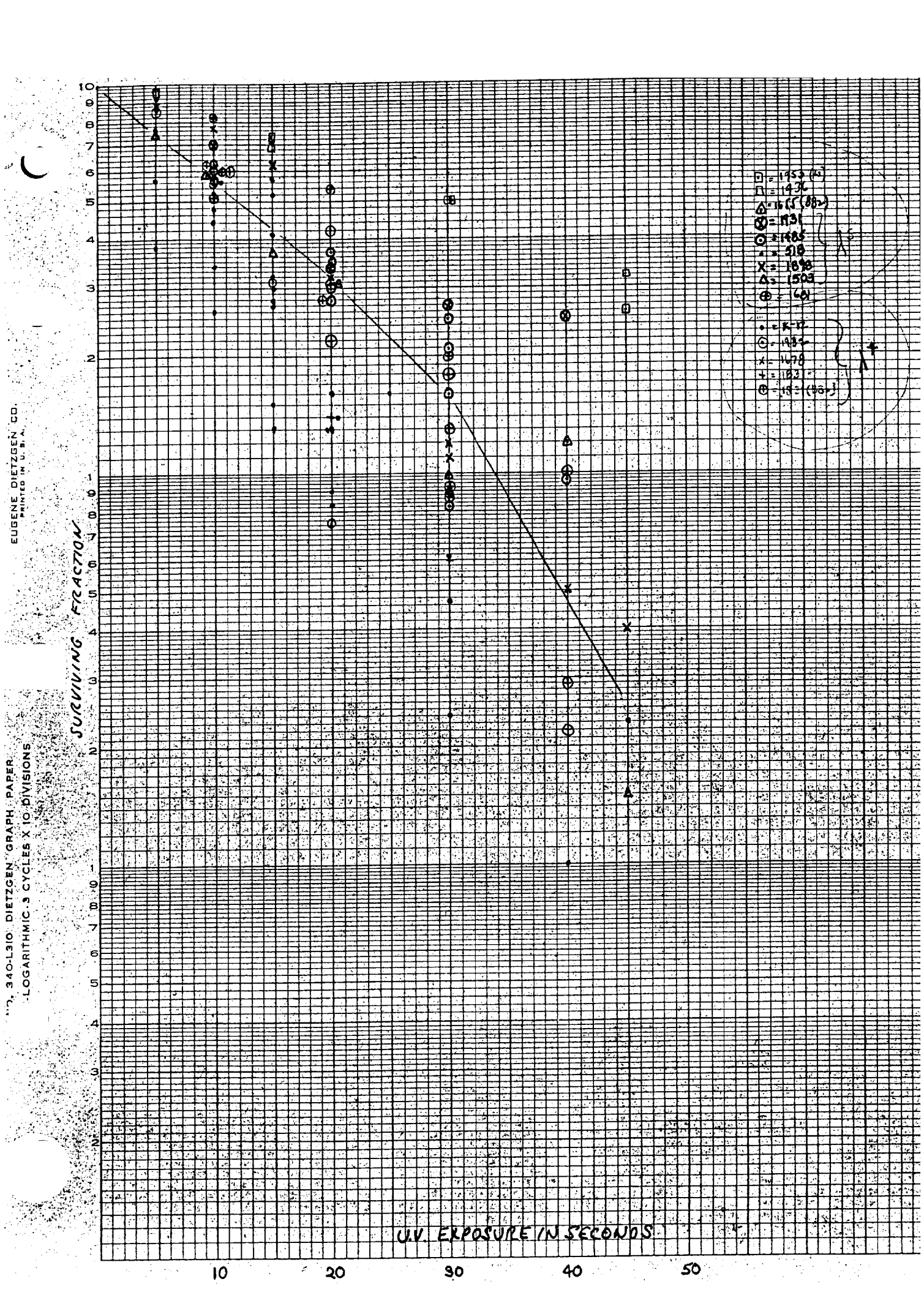
A267 - 57, 59, 60, 68



K-12 23, 25, 43, 53

Surv.





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LOGARITHMIC 3 CYCLES X 10 DIVISIONS

Irradiation - U.V - Exp II

(6) Morse 12/26/51

10 ml fresh culture (2 hours from overnight unaerated) diluted 1-10 in W-D buffer after centrifugation and resuspension in 10 ml W-D buffer.

Culture	Dose (sec)	Dilutions (0.1 ml plated)	Count (on EMB-Lac)	D.F.	Irrad. titer	Surviving Fraction (titer ÷ diluted 1-10 before irradiation)
A (W-1655)	0	10^{-6}	174	10^{-7}	1.74×10^8	
B (58-161)	0	10^{-6}	174	10^{-7}	1.74×10^8	
C (W-1681	0	10^{-6}	92	10^{-7}	9.2×10^7	
D (W-1682)	0	10^{-6}	102	10^{-7}	10.2×10^8	
A	60	10^{-4}	995 (EMB-Lac)	10^{-5}	9.95×10^7	5.7×10^{-1}
B	60	10^{-3}	57 (EMB-D)	10^{-4}	5.7×10^5	3.2×10^{-3}
C	60	10^{-3}	1937	10^{-4}	1.937×10^7	0.21×10^0 ± 2.1×10^{-1}
D	60	10^{-3}	1081	10^{-4}	1.081×10^7	1.0×10^{-1}

(7) Morse

Exp III 12/27/51

Stock suspensions from Exp II used.
Diluted 1-10 c̄ $PO_4^{=}$ W-D before Irrad.

Culture	Dose		Dilutions	(Almost plated) D.F.	all on EMB-lac- Counts	Titer	Irrad Titer (1-10)	S.F.
A	0	1st dilution into trypsin bottle	2, 4, (6)	10^7	202	2.0×10^9	2.0×10^8	
B	0		2, 4, (6)	10^7	304	3.0×10^9	–	
C	0	Stock suspension	2, 4, (6)	10^7	77	7.7×10^8	–	
D	0		2, 4, (6)	10^7	69	6.9×10^8	–	
A	100 secs.		2, (4), (5) ok	10^6	3			
				10^5	33	3.3×10^6		$\frac{3.3 \times 10^6}{2 \times 10^8} = 1.6 \times 10^{-2}$ (0.704)
B	100		1, (2), (3)	10^3	–			
				10^4	–			
C	100		(2), (3), (4)	10^5	–	no colonies		
				10^4	–			
D	100		(2), (3), (4)	10^5	–			
				10^4	–			

Exp IV (8) Morse
12/28/51

Stock suspension from Exp II used
Diluted with $PO_4^{=}$ W-D 1-10 before irrad.

Culture	Dose		Dilutions	(Oil and plates) D.F.	EMB lac Counts	Titer	Irrad. titer (-10)	S.F.
A W-1655	0	Stock susp 1st dilution into tryptone broth	2, 4, (6)	10^7	111	1.1×10^9	1.1×10^8	
B 58-161	0		2, 4, (6)	10^7	190	1.9×10^9	1.9×10^8	
C W-1681	0		2, 4, (6)	10^7	69	6.9×10^8	6.9×10^7	
D W-1682	0		2, 4, (6)	10^7	62	6.2×10^8	6.2×10^7	
A	80 sec.		2, (4), (5)	10^5	81	8.1×10^6	—	7.3×10^{-2}
B	80		(1), (2), (3)	10^2	142	1.4×10^4	—	7.4×10^{-6}
C	80		(2), (3), (4)	10^5	7.3	7.3×10^6	—	1.1×10^{-1}
D	80		(2), (3), (4)	10^5	52	5.2×10^6	—	8.4×10^{-2}

lac
Colonies picked and streaked EMB lac
cultures purified and added
to stocks 1805
1806
1807

58-161

Exp V (4) duplicate

Dose	Phage Titer/ml $\times 10^6$	Viable bacteria/ml	Phage / viable cell	Phage / killed cell
0	66	1.8×10^8	$\frac{6.6 \times 10^7}{1.8 \times 10^8} = 3.1 \times 10^{-1}$	—
20	61	3.5×10^7	$\frac{6.1 \times 10^7}{3.5 \times 10^7} =$	—
40	109	4.6×10^6	$\frac{10.9 \times 10^7}{4.6 \times 10^6} =$	4.5×10^7
60	73	3.6×10^5	$\frac{7.3 \times 10^7}{3.6 \times 10^5} =$	
80	46	1.0×10^4	$\frac{4.6 \times 10^7}{1.0 \times 10^4} =$	
100	6	1.2×10^3	$\frac{6 \times 10^6}{1.2 \times 10^3} =$	

(10) Morse

12/29/31 Exp II

Survival of B- Suspensions of Exp II → 58-161

Diluted with $PO_4^{\equiv}$ W-D. 1-10 before Irrad.

Dose	Dilutions	0.1 plated D.F.	EMB-lac Counts	Irrad. titer	S.F.
0	2, 4, 6	10^7	176	1.8×10^8	–
~~10~~					
20	2, 4, 5, 6	10^6	35	3.5×10^7	2.0×10^{-1}
~~30~~					
40	2, 3, 4, 5	10^5	46	4.6×10^6	2.6×10^{-2}
~~50~~					
60	2, 3, 4	10^4	3.6	3.6×10^5	2.0×10^{-3}
~~70~~					
80	1, 2, 3	10^2	101	1.0×10^4	6.1×10^{-5}
~~90~~					
100	u, 1	10^{11} 10^2	253 12	1.2×10^3	6.6×10^{-6}

(A) W-1655 λ

(11) Moses

Exp VI

Survival of (B) 58-161 λ+ and Lwoff Effect

New stock susp. prepared 1/2/52 from overnight unaerated Y.E. broth culture by resusp. in W-D $PO_4^{\equiv}$ - Before Irrad. dil 1-100 c̄ W-D $PO_4^{\equiv}$

	Dose	Dilution	Counts EMB loc 0.1ml	Titer	S.F.
B 58-161	0	1, 2, (4) →	~~[illegible]~~ 7	4 X 10^5	1
	20	1, 2, (3) →	208	2.1 X 10^6	1.3 X 10^1
	40	1, (2) →	349	3.5 X 10^5	2.5 X 10^-1
	60	(1) →	435	4.4 X 10^4	3.1 X 10^-2
	80	(1) →	167	1.6 X 10^4	1.1 X 10^-2

(1) dilutions made into TSB - incubated 40 minutes then diluted and plated - Xcepting 0 dose

A W-1655	0	(1), 2, (4) →	4	4 X 10^5	1.0
	20	1, 2, (4) →	28	2.8 X 10^6	
	40	1, 2, (3) →	164 ~~[illegible]~~	1.6 X 10^6	1.0
	60	1, 2, (3) →	122	1.2 X 10^6	6.6 X 10^-1
	80	1, 2, (3) →	~~[illegible]~~ 20	2.0 X 10^5	
			141	1.4 X 10^5	1.0 X 10^-1

1.4 X 10^6

1.6 X 10^6

1.7 X 10^5

1/2/52 (12) Morse
Exp VIII

Radiation Sensitivity of $\lambda^{\pm}$

Fresh suspensions - Made from overnight unaerated broth cultures resuspended in W-D $PO_4^{\equiv}$ - Diluted 1-100 before irradiation with W-D $PO_4^{\equiv}$

Pair			Count EMB-lac (0.1 ml)	Titer	S.F.
E W-1485 λ^s F K-12 λ^+	E-0	2, (4) →	122	1.2×10^7	
	E-80	(2), (3) →	20 77	2.0×10^5 7.7×10^4	1.4×10^5 1.1×10^{-2}
✓	F-0	2, 3, (4) →	268	2.7×10^7	
	F-80	un, (1) →	6	6.0×10^1	2.2×10^{-6}
G W-1673 H W-1678 λ^+	G-0	2, (4) →	82	8.2×10^6	
	G-80	1, (2) →	74	7.4×10^4	9.0×10^{-3}
	H-0	2, 3, (4) →			
	H-80	un, 1 →			
J-W-1177 λ^+ K-W-1603 λ^-	J-0	2, (4) →			
	J-80	un, 1 →			
	K-0	2, (4) →			
	K-80	2, (3) →			

no colonies - cells lift out? too few?

not done
insufficient time

Exp VIII-A (13) Morse 1/3/52

Radiation Sensitivity and Lwoff Effect
in W-1177 λ+ (J) and W-1603 λ- (resistant) (K)
Stock suspensions from Exp VII diluted 1-100 c̄ W-D PO4≡

Strain				Titer/ml	Corrected Titer	S.F.			
J W-1177 λ+	J-0	1, 3, 4 (in TSB) → ca 500	68	6.8×10^6	6.8×10^6	1-			
	J-60 immed. plat.	und, 1, 2 →	39	3.9×10^4	3.9×10^4	5.7×10^{-3}			
	1.0 ml + 10 ml Pan + YX Broth - Incub. 40 min @ 37 in WB	und, 1, 2 →	27	2.7×10^3	2.7×10^4	3.9×10^{-3}			
							plaques in 1785	titer/ml	
						dil 10^3	142	1.4×10^5	from 6.8×10^6 total cell
						10^4	16	1.6×10^5	2.7×10^4 viable cell
K W-1603 λ-	K-0	1, 3, 4 (in TSB) →	73	7.3×10^6	7.3×10^6	~~[illegible]~~			
	K-60 immed. plating	2, 3 →	64	6.4×10^5	6.4×10^5	8.7×10^{-2}			
	K-60 1.0 ml + 10 ml Pan + YX broth Incubation 40 m @ 37 WB	2, 3 →	79	7.9×10^4	7.9×10^5	1.1×10^{-1}			

Mouse 1 (51) (51) (6)

Recapture Exp. II

10 ml culture of each (A, B, C, D, D_A) centrifuged and resusp. in W-O PO$_4$ = Diluted 1-100 = W-O PO$_4$ = before inoc. (ca 10^6 cells/ml)

Diluted 1.0 ml + 10 ml Pen + Fx - Inc. 40 minutes @ 37C

Culture	Dose	Dilution	0.1 ml on EMB	Titer	S.F.	
A (W-1655)	0	1, (3) →	620	6.2×10^6	—	
B (58-161)	0	1, (7) →	768	7.7×10^6	—	
C (W-1641)	0	1, (3) →	821	8.2×10^6	—	
D (W-1682)	0	1, (7) →	919	9.1×10^6	—	
D_A (58-161 c 82)	0	1, (7) → ↑ TSB	486	4.9×10^6	—	

These diluted 1-10 further than above because of nitrofurazone

A	~~40~~	(1) →	147	1.5×10^6 / 1.3	$\frac{1.3 \times 10^6}{6.2 \times 10^6}$	$= 2.9 \times 10^{-1}$ v
		(2) (3) →	11	1.1×10^6		
B	~~40~~	(1) (2) →	48	1.8×10^5	$\frac{4.8 \times 10^5}{7.7 \times 10^6}$	6.2×10^{-2} v
C	~~40~~	2 (3) →	35	3.5×10^6	$\frac{3.6 \times 10^6}{8.2 \times 10^6}$	4.4×10^{-1} —
D	~~40~~	(2) (3) →	28	2.8×10^6	$\frac{2.7 \times 10^6}{9.1 \times 10^6}$	2.9×10^{-1}
		→	246	2.5×10^6 / 2.7		
D_A	40	(1) (2) (3) →	6	6×10^5	$\frac{5.5 \times 10^5}{4.9 \times 10^6}$	1.1×10^{-1}
		→	50	5×10^5 / 5.5		

↑ dilution for growth but considered in S.F.

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

10^6/ml → 1, 3 →

II – III – IV

DOE EXTENSION

IV

λ 58-161

λ W-1655

λ W-1681

λ W-1682

λ 58-161 882

DA

Other pr

VII λ+ ↕ 3.7

VII K-12 λ+ ↕ 2.6, 2.0, 1.9, 1.5 (17 Um, 19 Um, 20 Um)

W-1673 λ+ ↕ 2+

W-1678 λ+

Comp VIII-A 1177 λ+ ↕ 2.5

W-1655 λ− (resistant)

58-161 ↕ 1831 (18 Um, 1.0)

compare c 58-161 W1655

K-12 ↕ W-1655 (20 Um, 2.5)

W-1831 + 882 ↕ c. 1.0

PED.

(F) K-12 λ+

58 ↓ uv

(B) 58-161 λ+ ← DA λ+ 882+

↓ uv

(A) W-1655 λ^s

↓ +λ

W1831 λ+

W-1681 882+ λ^s

↓

W-1682 882+ λ+

↓ uv

Y-87 lac−

↓ uv

W-518 Gal− λ^s

↓ +λ

W-811 λ+

↓ uv

W-1485 λ^s (E) prototroph

↓ spont

↓

W-1673 (G) n.g. P−

↓ +λ

W-1678 λ+ (H)

679 T−

↓

679-680 T−L−

↓

Y-10

↓

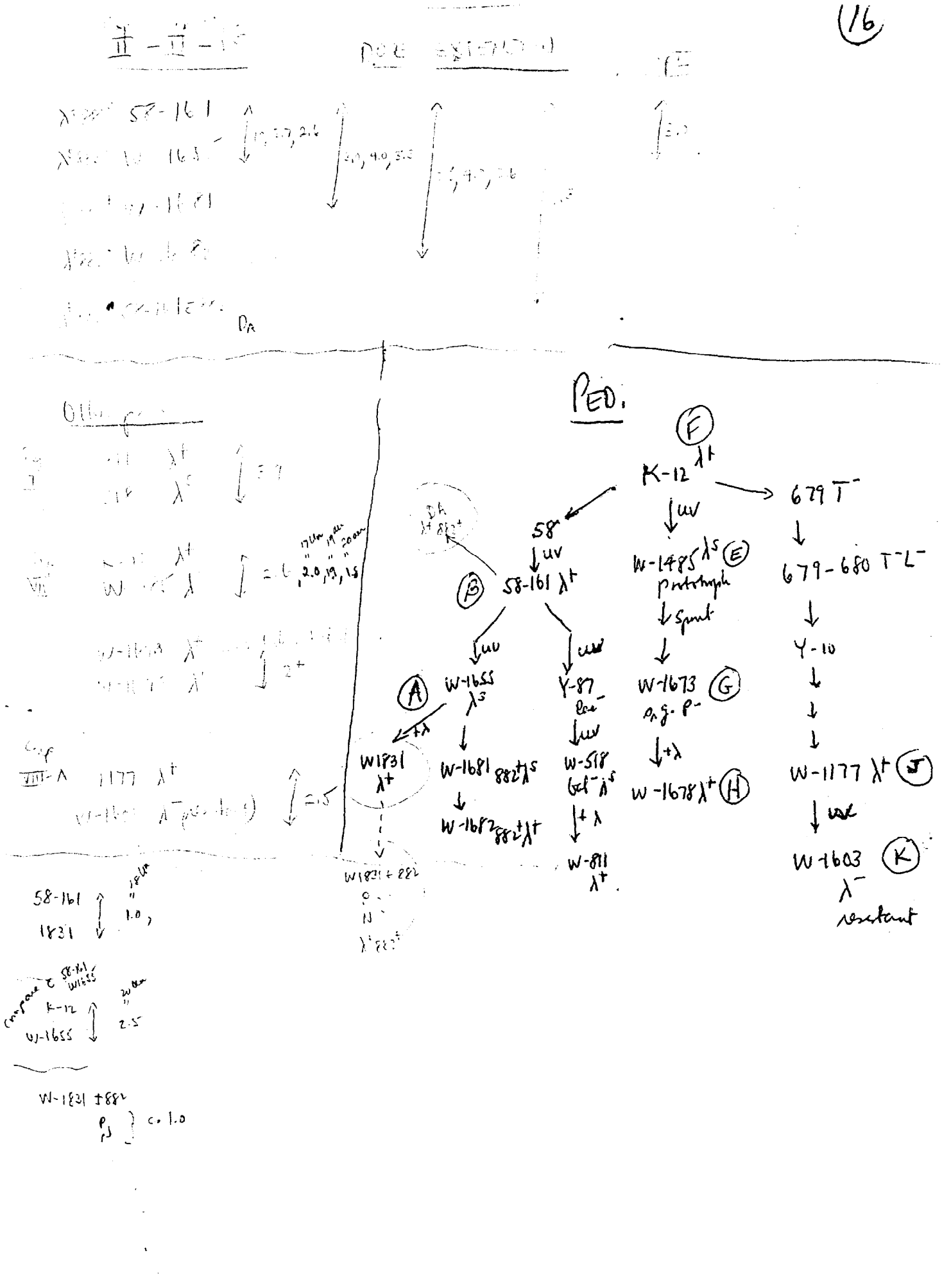
↓

↓

W-1177 λ+ (J)

↓ uv

W-1603 (K) λ− resistant



(F) (E) 2/5/51 (17)

Comparison of K-12 λ^+ and 1485 λ^s

Unaerated broth cultures - centrifuge and resuspend in W-D buffer. Dilute 1-100 with W-D buffer before inaddiation - Make last dilution into P-X broth - Incubate this dilution tube for 40 minutes resample.

Expected Survival of cells

Dose	K-12 Inc.	K-12 Unincu.	1485 Inc.	1485 Unincu.
0	10^6	10^7	10^6	10^7
20	10^5	10^6	5×10^5	5×10^6
40	10^3	10^4	10^5	10^6
60	10^2	10^3	5×10^4	5×10^5
80	0	10	10^4	10^5

K-12	Dose	Charact	Dilutions	Plate	Count	
✓	0	unincubated	2, 4 → 0.1 ml	F-0-4	80	
		incubated	4 "	F-0-4I	123	$\times10^5$
✓	20	unincubated	3 "	F-20-3	154	
		incubated	3 "	F-20-3I	206	$\times10^4$
✓	40	unincubated	2 "	F-40-2	141	
		incubated	2 "	F-40-2I	367	$\times10^3$
✓	60	unincubated	1 undil	F-60-U	781	$\times10^1$
		incubated	→	F-60-1I	58	$\times10^2$
✓	80	unincubated	undil. →	F-80-U	41	$\times10^1$
		incubated	1 →	F-80-1-I	0	$\times10^2$

Surviving Fractions

K-12 Dose	Incubated S.F.	Unincubated S.F.
0	1.0	1.0
20	1.7×10^{-1}	1.9×10^{-1}
40	3.1×10^{-2}	1.8×10^{-2}
60	4.7×10^{-4}	9.6×10^{-4}
80	0	5.1×10^{-5}

W-1485 Dose	Incubated S.F.	Unincubated S.F.
0	1.0	1
20	4.8×10^{-1}	4.7×10^{-1}
40	1.5×10^{-1}	1.8×10^{-1}
60	6.1×10^{-2}	6.1×10^{-2}
80	6.4×10^{-3}	4.6×10^{-3}

W-1485					
0	unincubated	2, 4 →	E-0-4	160	$\times10^5$
	incubated	4 →	E-0-4I	229	
20	unincubated	2, 4 →	E-20-4	75	$\times10^5$
	incubated	4 →	E-20-4I	110	
✓ 40	unincubated	2, 3 →	E-40-3	290	$\times10^4$
	incubated	3 →	E-40-3I	353	
60	unincubated	2, 3 →	E-60-3	*193/2 = 97	$\times10^4$
	incubated	3 →	E-60-3I	140	
✓ 80	unincubated	2 →	E-80-2	73	$\times10^3$
	incubated	2 →	E-80-2I	147	

Many lysed cols & sectors of K-12, espec 40: 1 col = W-1872

* 0.2 ml plated

2/7/52

Comparison of U.V. resistance of 58-161 = A ○
W-1655 = B ○
W 1831 = C ×

24 hour unaerated cultures used - centrifuged and resuspended in W-10 buffer - diluted 1-10 with W-0 buffer before irradiation

Expected			Experimental			EHB Plate	Counts	Titr	S.F.
Cult.	Dose	Survival	Cult	Dose	Dilutions*				
A	0	$1.0 = 10^7$ cells/ml	A	0	2, 4	A-0-4	201	2.0×10^7	1.0
	20	$0.1 - 10^6$ cells/ml		20	2, 3	A-20-3	579	5.8×10^6	2.9×10^{-1}
	40	$0.01 - 10^5$ cells/ml		40	2	A-40-2	56	5.6×10^4	2.7×10^{-3}
B	0	$1.0 - 10^7$ cells/ml	B	0	2, 4	B-0-4	142	1.4×10^7	1.0
	20	$0.5 - 5\times10^6$ cells/ml		20	2, 4	B-20-4	35	3.5×10^6	2.5×10^{-1}
	40	$0.1 - 0.5 = 10^6$ cells/ml		40	2, 3	B-40-3	237	2.4×10^6	1.7×10^{-1}
C	0	$1.0 = 10^7$ cells/ml	C	0	2, 4	C-0-4	102	1.0×10^7	1.0
	20	$0.1 - 10^6$ cells/ml		20	2, 3, 4	C-20-3	182	1.8×10^6	1.8×10^{-1}
						C-20-4	27		
	40	$0.1 - 10^6$ cells/ml		40	2, 3	C-40-3	22		
		$0.01 - 10^5$ cells/ml				C-40-2	255	2.5×10^5	2.5×10^{-2}

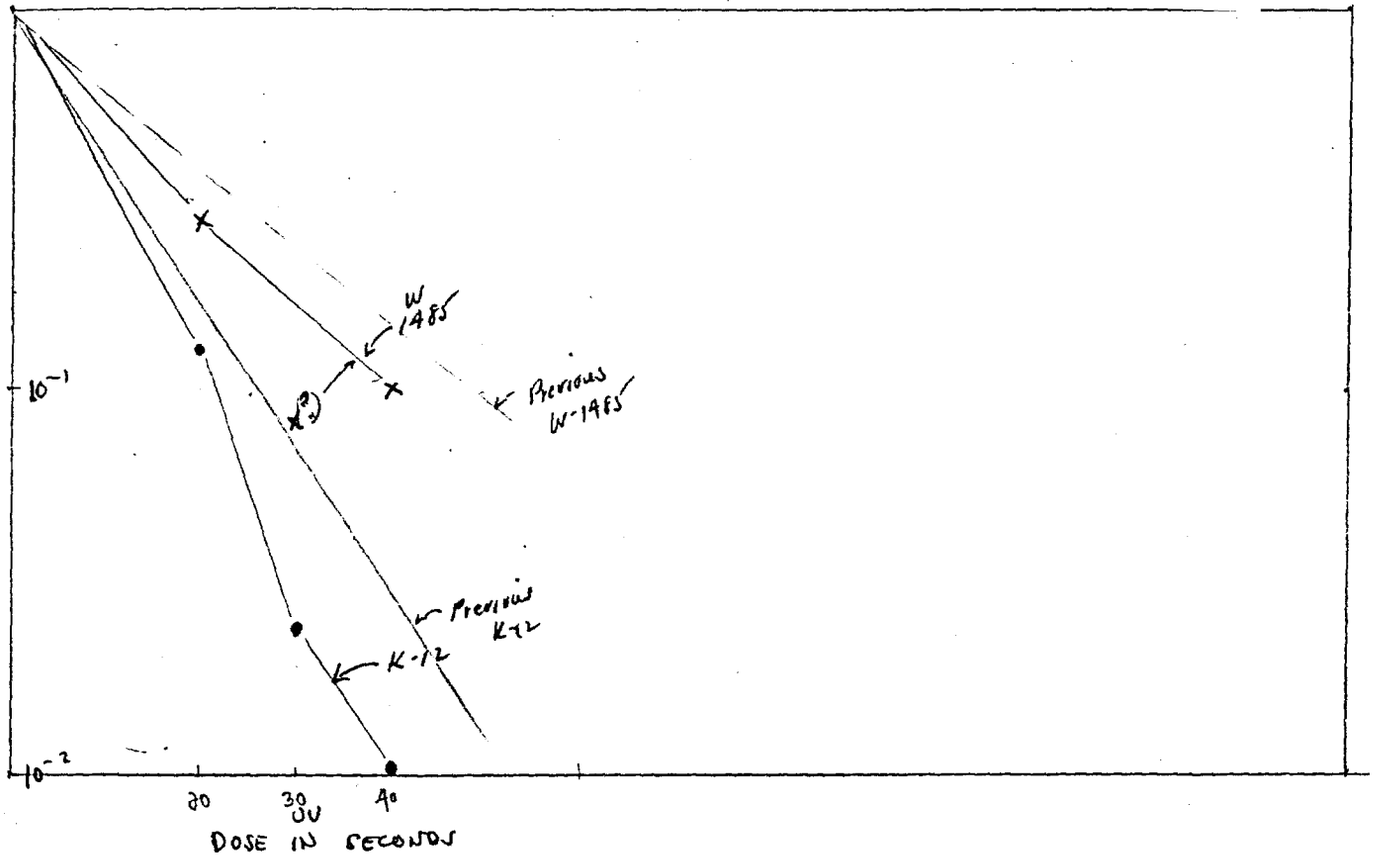
*water

Comparison of K-12 and W1485 —

Aerated cultures = 0.1 ml 24 hour unaerated culture + 10 ml PX broth incubated c̄ air 37C 4½ hours — Centrifuged and resuspended in W-D-buffer - diluted 1-100 before irradiation

K-12 Dose	Expected Titer	Dilution	EMB Plates	Counts	Titer	S.F.	
0	1×10^7	2, 4 →	A-0-4	229	2.3×10^7	1.0	0/229
20	1×10^6	2, 3 →	A-20-3	300	3.0×10^6	1.3×10^{-1}	92/229
30	5×10^5	2, 3 →	A-30-2	—	—		data obtained from cards prepared separately from other two points.
			A-30-3	56	5.6×10^5	2.4×10^{-2}	83/229
40	1×10^5	2, 3 →	A-40-2	238	2.4×10^5	1.0×10^{-2}	
			A-40-3	21	—		71/229

W1485						
0	1×10^7	2, 4 →	B-0-4	277	2.8×10^7	1.0
20	5×10^6	2, 3, 4 →	B-20-3	—		
			B-20-4	80	8.0×10^6	2.8×10^{-1}
30	2×10^6	2, 3 →	B-30-3	247	2.5×10^6	8.2×10^{-2}
40	1×10^6	2, 3 →	B-40-3	267	2.7×10^6	9.6×10^{-2}



K W 2/10/52.

Comparison of K-12 and 1485

Cultures from overnight unaerated PX broth by 0.1 + 10.0 and aerated 5 hours - Centrifuge and resuspended in W-D buffer - Dilute 10^6 = ca 10^3 cells/ml - Sampled immediately for 0

2, 4, C

K-12	Dose	Plate	Count/plate	Count/ml	Phages	S.F
	0	K0 -	446	4.5×10^3	0	1.0
	10	K-10 -	195	2.0×10^3		4.4×10^{-1}
	20	K-20 -	62	6.2×10^2	No	1.4×10^{-1}
	30	K 30 -	21	2.1×10^2	phage	4.7×10^{-2}

Only with phage

W 1485	Dose	Plate	Count/plate	Count/ml	Indicator	
	0	W-0	626	6.3×10^3	Contaminated	1.0
	10	W-10	392	3.9×10^3	and	6.2×10^{-1}
	20	W-20	234	2.3×10^3	Carrying	3.7×10^{-1}
	30	W-30	129	1.3×10^3	phage	2.1×10^{-1}

Little higher than usual

Examination of W-1655 = C

Unaerated culture - 30 hours centrifuge resuspended in W-D - dilute 10^6 - ca 10^3 cells/ml

Dose	Plate	Counts/plate	Count/ml	
0	C-0	175	1.8×10^3	1.0
5	C-5	~~mutt~~		
10	C-10	138	1.4×10^3	7.8×10^{-1}
20	C-20	92	9.2×10^2	5.1×10^{-1}
30	C-30	64	6.4×10^2	3.6×10^{-1}
40	C-40	56	5.6×10^2	3.1×10^{-1}

Use agreement with W-1661 in W-1661 & 9,5, etc

Examination of W-1655

Unaerated culture - 28 hours PX - Centrifuge, resuspd in W-D. buffer - dilute 10^6 - Inoculate

Dose	Plate	Counts
0	W-0 -	?
5	W-5 -	77
10	W-10	70
15	W-15	60
20	W-20	43
30	W-30	58 ?
40	W-40	-
50	W-50	-

Odd exp - fresh plate appd?

1831 + 882 -

Four ~~colonies~~ plaques picked (central growth) and streaked

3 grew -

1482 } to date - single colonies on original EMB lact picked - two sets 40 in 1st
1832 } 16 in 2nd

one possible diploid in 1st 40, none in 2nd

Possible streaked on EMS and EMB - indicated dip.

Three colonies of EMS dip picked to EMB, inoculated in DM+ lactose (1.0 ml/10 ml 10%)

aerated 10:15 2/19/52

just practice →

Comparison of K-12 (K) with 1485 (W)

2/13/52

4 hour aerated culture from overnight incubated - dilute to contain 10^3 cells/ml (2 W-0) - Incubate - Plating for phage on S18

K-12 as Plaque	K-12	Dose	Count/plate	Diff.	Count/ml	Phage/ml	S.F.
0.25		0	278		2.8×10^3	70	50
0.50		10	156	122	1.6×10^3	$\frac{990}{2} = 1560$	5.6×10^{-1}
0.8		20	37	241	3.7×10^2	2240	1.3×10^{-1}
0.57		30	17	261	1.7×10^2	1570	6.1×10^{-2}

1485	0	187	1.9×10^3	S.F. 1.0
	10	106	1.1×10^3	5.7×10^{-1}
	20	66	6.6×10^2	3.5×10^{-1}
	30	30	3.0×10^2	1.6×10^{-1}

Ratio: cells lost / phage gained — Dose

$\frac{122}{156} = 0.79$ — 0-10

$\frac{241}{224} = 1.1$ — 0-20

$\frac{261}{157} = 1.7$ — 0-30

Culture started PX broth

WB-1] project X → 0.25 + 10 ml PX (1-16) 9:15

W1-14, W1-16] for Penicillin Run → 0.25 + 10 ml PX 9:15

K-12, 1485] possible retake on above exp.

2/14/52 (23)

Comparison of K-12 and W-1485

Levoff Effect — 4 hr aerated cultures in PX from overnight unaerated cultures

K-12

Dose	Plate	Colonies/plate	diff.	/ml		Plaque/plate	diff	S.F.	K-12 as plaques
0	K-0	250		2.5×10^3	0	-	<50	0 - 1.0	
			18					5 - 9.2×10^{-1}	<25
5	K-5	232		2.3×10^3	5	105	314/3 = 105	10 - 5.2×10^{-1}	.42
			120				<55		
10	K-10	130		1.3×10^3	10	155	155	15 - 2.7×10^{-1}	.62
			182				105		
15	K-15	68		6.8×10^2	15	230	360		1.00
			210				205		
20	K-20	40		4.0×10^2	20		—	25 - 1.6×10^{-1}	0.74
			210				134		
25	K-25	41		4.1×10^2	25	194	184	35 - 1.6×10^{-1}	?

Ratio $\frac{\text{Cell loss diff.}}{\text{Plaque gain diff.}}$

Dose	
0-5	$\frac{18}{<55} = >0.32$
0-10	$\frac{120}{105} = 1.1$
0-15	$\frac{182}{205} = 0.89$
0-25	$\frac{210}{134} = 1.6$

W-1485

Dose	Plate	Colonies/plate	Count/ml	S.F.
0	W-0	251	2.5×10^3	1.0
10	W-10	153	1.5×10^3	6.0×10^{-1}
20	W-20	75	7.5×10^2	3.0×10^{-1}
30	W-30	62	6.2×10^2	2.5×10^{-1}

Cultures

K-12
W-1485
Wq-14
Wq-16
WB-1

are lost - tipped over in incubator

Cultures made - 2/15/52

PX { K-12 - repeat c̄ incubation
1831 - examine 1831 + 882 for lys 882 !
WB-1 - project X.

Sat. 2/16/52 K-12 aerated culture started 7:50 out at 9:50 [illegible]
WB-1 " " - 7:55 - no lysis 11:10
refrigerat until 2/16/

Effect of Post Incubation

K-12 - Centrifuge - resusp in W-D - Dilute to 10^4 viable cells/ml - Post inad. incub. 40 min at 37C

Dose	Plate	Counts/plate
0	K-0 -	58
	K-0 - Inc	140
15 sec	K-15	25
	K-15 - Inc	20

2/17/52 Pyxed WB-1 tube plated out - TSA

10^2 -

10^4 -

10^6 -

Culture started 2/17/52

K-12

1905

1831

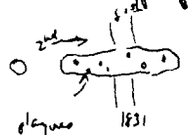
WB-1

WB-1 culture continued at 37C

in 10:00 AM

out 11:05 AM lysis apparently beginning.

20 colonies of 1831 + 882 (from plaques) streaked across 1831 for lysogenicity c̄ 882 made 2/16/52 examined - no clear cut examples of sensitivity of 1831 to any of streaks noted. One streak contained small plaque



plaques before reaching 1831 - as if lysis of streaked colony - not 1831

Cultures 2/18/52
Started

K-12
1831
1485

2/19/52

Aerated cultures started K-12, 1485 - at 8:15 - 0.25 + 10 ml PX
unaerated overnight
wt 12:45

1831 + 882

z = 1831
W = 1485
P = plague forming - see bottom of L4
N = non-plague forming ⊙

Results 2/20/52

N gives plaques on it self.
lyses 1485 = $N^{\lambda+}$
lyses 1831 = N^{882+}

P gives no plaques on self.
lyses 1485 = $P^{\lambda+}$
lyses 1831 = P^{882+}

K-12 - Effect of post-incubation on Survival

Incubate - aerated : 4:30 hours in PX - Centrifuge - resuspend in WD*
dilute c̄ W-D to contain 10^4 cells/ml - After mod. 1/10 dilution into PX broth - Incubated c̄ air 40 min at 37C

Dose	Plate	Count/Plate	S.F.
0	K-0	281 - 276	1.0
	K-0-I	270	
10	K-10	84	3.1×10^{-1}
	K-10-I	185	6.7×10^{-1}
15	K-15	42	1.5×10^{-1}
	K-15-I	117	4.2×10^{-1}
20	K-20	23	8.3×10^{-2}
	K-20-I	58	2.1×10^{-1}

Suggests that post irradiation incubation "de-activates" Lwoff effect.

I = post-Incubated counts.

* remainder of this suspension irradiated 25 sec, ca 8 ml PX added and incubated c̄ aeration
2:00 PM - 4:00 PM - slight lysis apparent.
left on bench overnight - nearly clear next morning - Centrifuged and assayed plaques 1485
dil = 10^6 - 43 = ca $86 \times 10^6 \times 10 = 8.6 \times 10^8$

Cultures started 2/18/52
K-12
1485
1831