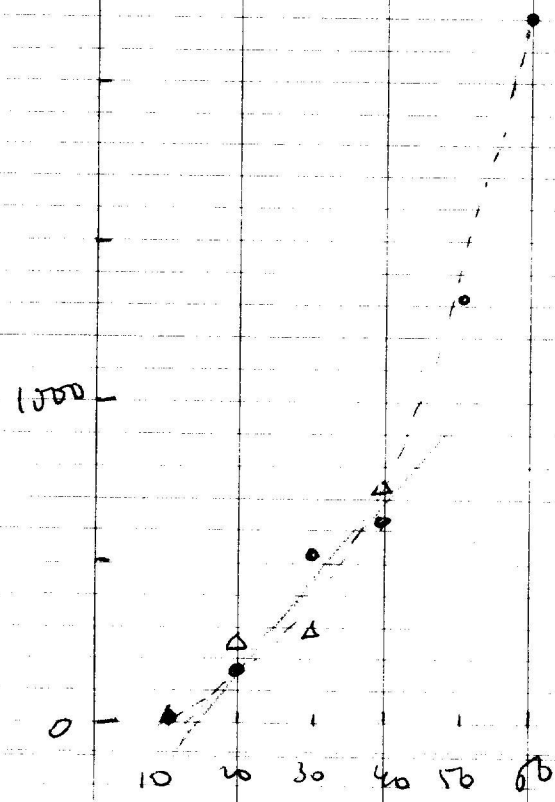




	1	2	3	4	5	6	7	8	9	10
			D (fm B.)		Sgal					
1			A	B	A	B				
2	Mfr 13		.05	.1						
3										
4										
5										
6		10	22	104	21					
7										
8		20	173	301	271					
9				302						
0		30'	522		297					
1		40'	637		725					
2										
3		50'	n! 320							
4										
5		60'	n! 2200							
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										



copy + send

May 19, 1958

REF:

1408/7

19

1 2 3 4 5 6 7 8 9 10

Hfr₁₃ - Gal

Hfr₁₃, W 3908. - 1 ml + 7.5 ml Pen, 1 hr rotation =

Two timed crosses. **A. A.** non pulsed, in Penassay

B. B. Pulsed in Penassay, diluted in BGA.

B. 8 ml ♂ conc 2x, + 12 ml ♀ conc. 2x, in flask in waterbath. 2 ml samples taken at 15, 20, 25, 30, 35, 40' - Chilled, blended, plated .05 on 5 Gal B₁ Jun (some with Me)

A. ♂ + ♀ conc 30x in chilled Penassay (.3 ml) then 0.2 of each mixed, incubated ~~1/2~~ 1'30", diluted to warm BGA 1/100 (2 to 20 ml) -

Samples taken at time	15'	20'	25'	30'	35'	40'
amount	2	2	2	1	1	1
chilled diluent	-	-	1	1	2	3

Blended, plated .05 on same medium as before.

Plate recombination with ~~0.1~~ 0.1 of 30x conc mix + .9 water, of each part .025 + .025, and .05 + .05 -

Plate counts

(A)

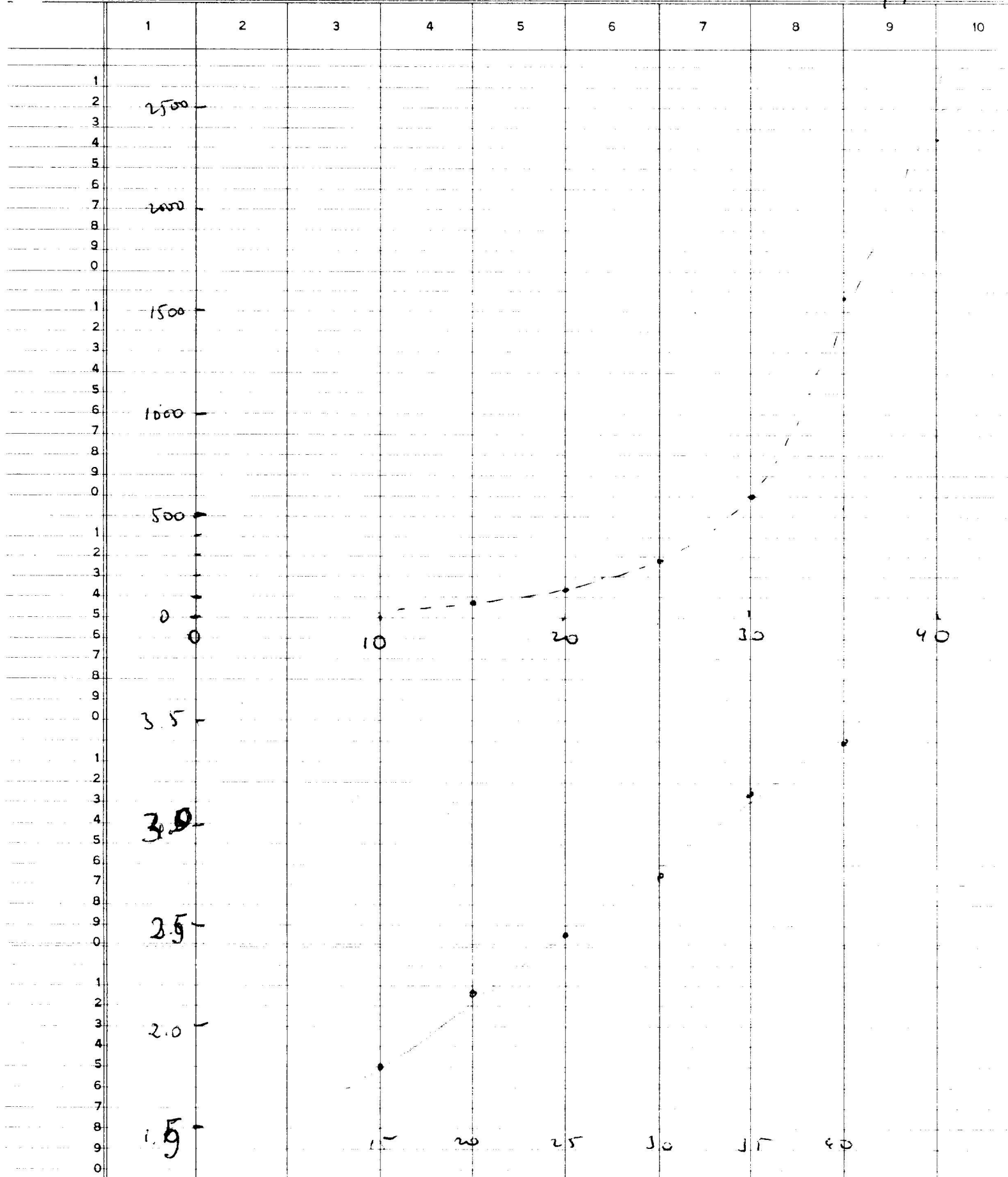
	0	15	20	25	30	35	40
	1	56	118	174	386	490	689
	2	83	126	176	208	497	541
	3		153	183	291	578	553
				213	317	521	571
		69.5	136	186	300	521	588
x dilution		69.5	136	279	600	1553	2352



1408/7

19

REF:





19

May 21, 1958

REF:

1408/8

	1	2	3	4	5	6	7	8	9	10		
				Gal timing with Hfr								
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												

Gal timing with Hfr

W 3870 from frag

W 3908 from recently isolated colony

1 + 7.5 ml Pen, rotated 1 hr, spun, resuspended to same conc.

Mating mixture 5 ml ♂ + 15 ml ♀ at 37° in flask

sample 1 ml every time, dilute with 1.5 ml distilled water and also further dilution (A) and also further dilution (B).

times 17' 20' 23' 26' 29' 32' 35' 38' 41'

dilution B 1+1 1+2 1+3 1+4 1+5 1+6 1+7 1+8 1+9 (A) + H₂O

Plate .05 on minifun B₁

Plate recombination : conjugation dilution 1 + 1.5 water, .025 of each parent per plate

72

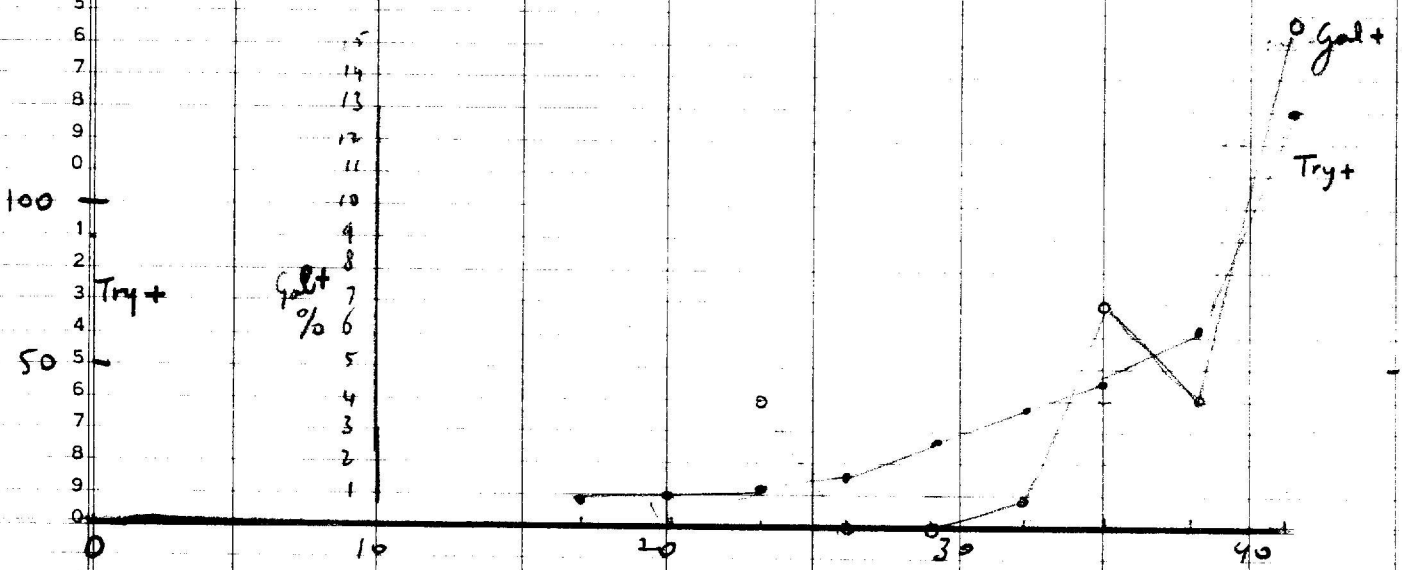
23/5

19 50

REF:

1408/8

	1	2	3	4	5	6	7	8	9	10
1		D(Sm B ₁)			Gal A					
2										
3										
4		A	B	ave	Gal+	TOT	%			
5										
6										
7	17	10, 9	0, 4	9.5	-	-				
8										
9	20	13, 12, 12	0, 3	10	0	3				
0										
1	23	8	0, 0	11	1	25	4%			
2										
3	26	19	1, 0	16.5	0	31	0			
4										
5	29	31, 26	1, 0	27.2	0	52	0			
6										
7	32	34, 39	0, 3	36.5	1	110	0.9			
8										
9	35	39, 62	5	45.2	9	130	6.9			
0										
1	38	51, 70	0, 1	60.7	5	122	4.1			
2										
3	41	138	2, 5	130	43	275	15.6			



Two modes of entry?

[Handwritten signature]



19 May 24, 1958.

REF: 1408/9

	1	2	3	4	5	6	7	8	9	10	
				<u>gal timing with H₂O₂</u>							
1											
2				Identical to 1408/8, except that series B has							
3				been limited as follows:							
4											
5											
6											
7				44'	47'	50'					
8											
9				1+1	4+2	1+3					
0				1/2	1/3	1/4			(A) + H ₂ O		
1									elution.		
2											
3											
4											
5											
6											
7											
8											
9											
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											

and times: 10', 44', 47', 50' have been added



19 May 26, 1958 -

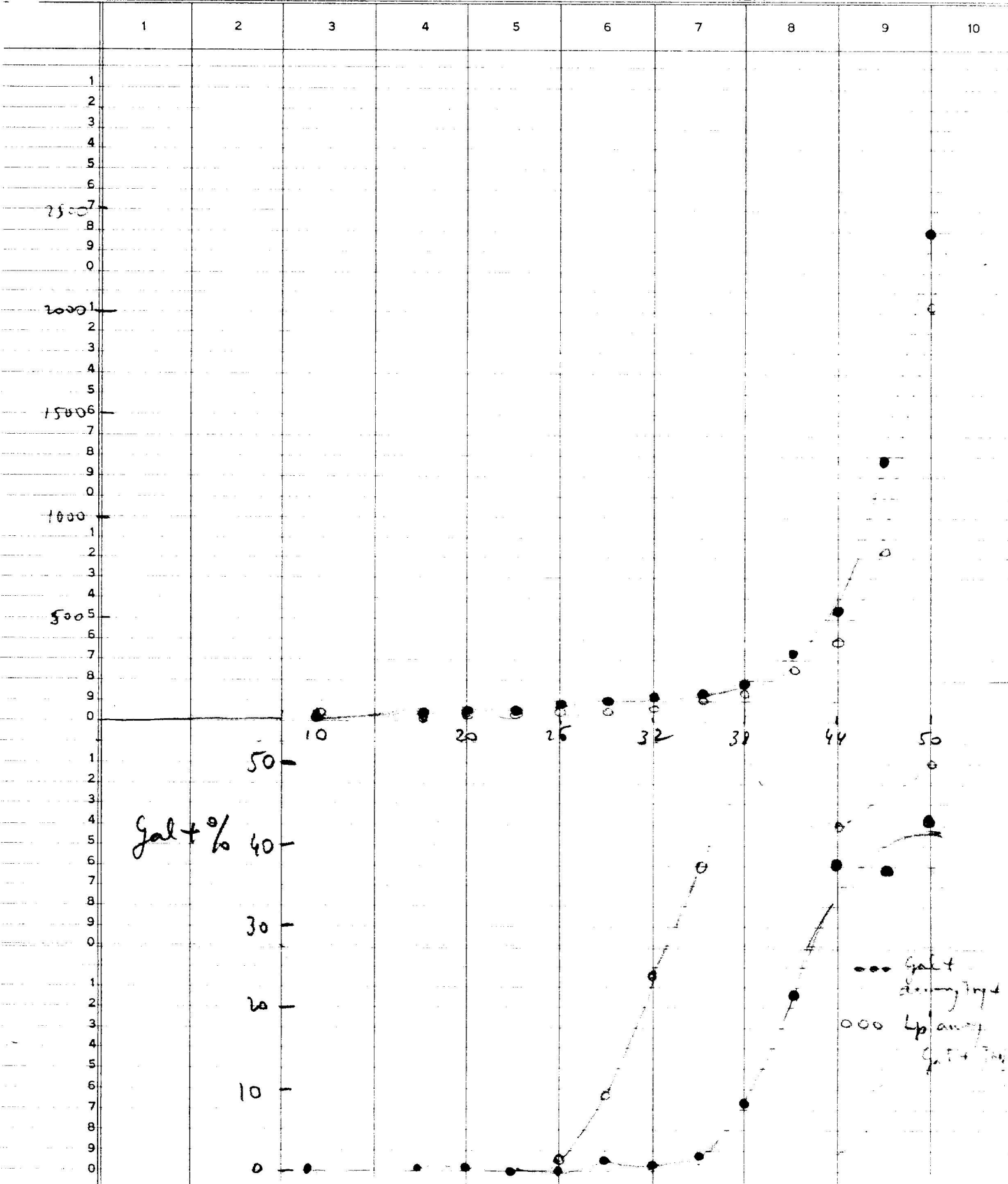
REF: 1408/9

	1	2	3	counts (40x)	6	7	8	9	10
1	Time								
2									
3									
4	0	43, 28		Dilution 1/2.5: 13 colonies					
5									
6	10	10, 15, 21, 15					20, 26, 27	17	
7									
8	17	33, 44, 30, 50					19, 33, 31, 31		
9									
0	20	53, 51, 50, 51					33	26	29
1	23	58, 56, 66, 56					45	42	52, 31
2									
3	26	72, 98, 83, 92					58	60	61, 43
4									
5	29	89, 97, 92					47	45	45
6									
7	32	108, 117, 121					55	106	85
8									
9	35	123, 141, 138, (110) †					94	138	115
0									
1	38	150, 216, 200					152	161	150
2									
3	41	322, 335, 360, 320					284	234	270, 288
4	44 B	253, 278. (1/2)		44 A	443, 514		47	46	58, 36
5									
6	47 B	361, 500		47 A					
7									
8	50 B	580, 620							
9									
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									
0									

† agar surface scratched

* in region of A and B

284/47
234/46
270/58
288/36
284/47
256





1958 May 31st

REF: 1408/10.

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5	W 3870	&	W 3959	(Gal ₂ Try)						
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
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5										
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7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										

Gal₂ timing - Hfr₂

W 3870 & W 3959 (Gal₂ Try) -

Same as 1408/8 and 1408/9 -

1^h 15' cultures (1 ml + 7.5 ml) - W 3870 from old broth in

frg. - W 3959 near (Rotated overnight) -

Spun, resuspended to same conc., mixed 5 ml ♂ + 18 ml ♀.
in flask -

sampled 1 ml at times: 23, 26, ... 59. + 1.5 ml chilled water

From 41' onwards also dilutions prepared (B series).

	41	44	47	50	53	56	59
series A	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
B*	2	3	6	12	20	50	100

Blended → H
↓
culture → H

* dilution with respect to A

Plating: .05 on { D-O B, fur
S Gal " "
M Gal " " try.

→ log No. of Try⁺ recombinants

0 1 2 3 4 5

→ time

10

20

30

40

50

60

50

40

30

20

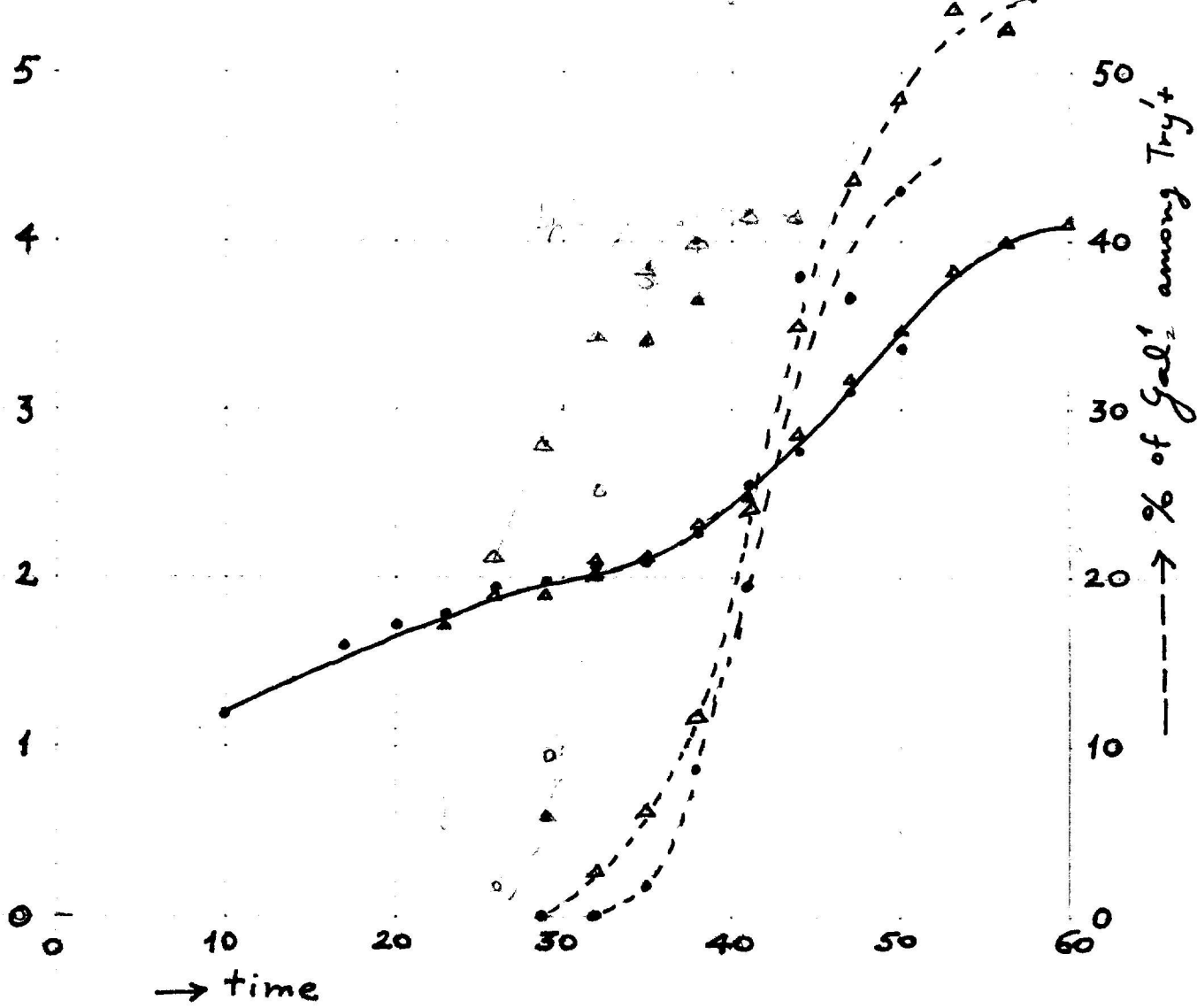
10

0

→ % of Gal⁺ among Try⁺

Expts: 1408/9 ●●●● Gal₁
 1408/10 ▲▲▲▲ Gal₂

Final yield of Gal⁺ + Try⁻ } 3% of the input
 Gal⁺ + Try⁺ }





	1	2	3	4	5	6	7	8	9	10
		(Average value)	cell factor							
1	Time	Gal + small	Gal + large			Al Gal Time - reduction				
2						expected Gal + try + (*)				
3										
4										
5										
6	0	12	-							
7										
8	23	14	-							
9										
0	26	115	-							
1	29	702	1			0.4				
2										
3	32	2919	1.5			3.4				
4										
5	35	7058	3			8.2				
6										
7	38	9728	23			24.0				
8										
9	41	18240	37	x 2		66.7				
0										
1	44	14934	210	x 3		253				
2										
3	47	43320	600	x 6		607				
4										
5	50	31008	1536	x 12		1460				
6										
7	53	57700	2550	x 20		3497				
8										
9	56	36100	4200	x 50		5210				
0										
1	59	68200	7700	x 100		7847				
2										
3										
4										
5										
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										

* Calculated from: (try +) x (50 Gal + any others)

1408/9 & /10.

entry of Lp^1 with $\left\{ \begin{array}{l} \circ \circ \circ \circ \circ \circ \text{ Gal } \delta^1 \\ \triangle \triangle \triangle \triangle \text{ Gal } \delta^2 \end{array} \right\}$ in M Gal Tryon

Lp^1 ratio

Try + Gal₂ +
Ratio of Gal +
among Try +
Try + Gal₁ +

Try + log counts
14

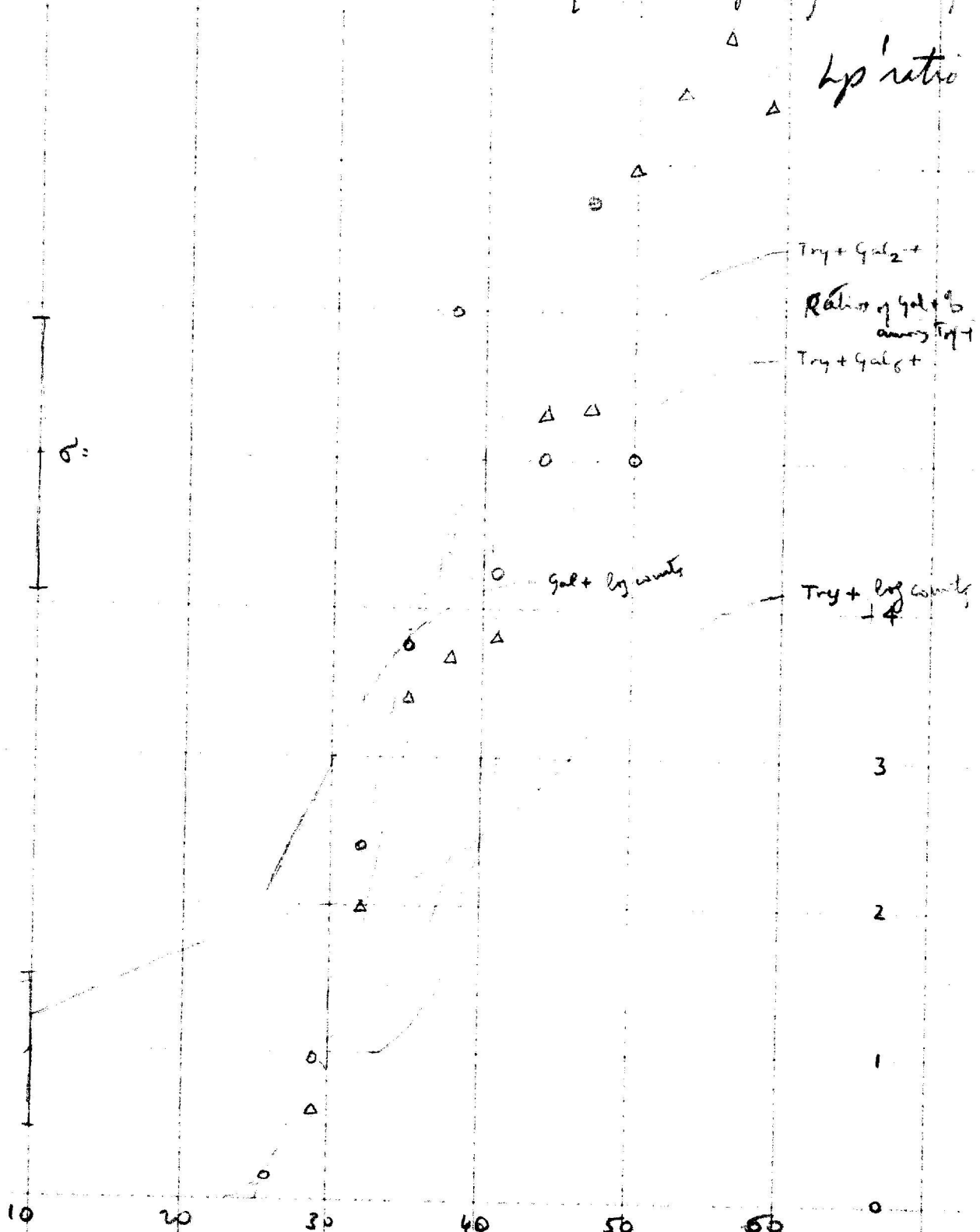
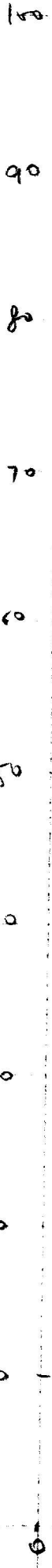
Gal + log counts

3

2

1

σ_1





19

June 10, 1958.

REF:

1408/11

1 2 3 4 5 6 7 8 9 10

1
2
3
4
5
6
7
8
9
0

1
2
3
4
5
6
7
8
9
0

1
2
3
4
5
6
7
8
9
0

1
2
3
4
5
6
7
8
9
0

Hfr, TIMING OF GAL, LP, Try-

ORC W3953, W1895: 1 ml + 7.5 ml Peay 1^h rot.,
Spun, resusp. each in 2 ml = 4 x concn
Mixture: ♂:♀ = 1:1.

Sampled 1 ml at times: 10', 15', 20', 25', 30', 35', 40', 50'
and diluted 1/2.5 by addition of 1.5 chilled water.
Blended and plated .05 ml. on 3 media.
Sampled .5 ml at times: 60', 70', 80', 90', 100', 120', 150'
and diluted 1/3 by addition of 1 ml chilled water.
Blended and plated.

Media: M Gal Jm Meth Try
F¹ Gal Jm Meth
D Gal Jm Meth



19 June 12, 1958.

REF: 1408/11

	1	2	3	4	5	6	7	8	9	10
1		S Gal for B, Meth.				D Sm B ₁		M Gal for B,		
2	Time	total count	gal +					Note Try		
3								only Gal +		
4										
5	0	200	1			100, 139		0		
6										
7	10	183	0			310		0		
8										
9	15	213	0			N 320		0		
0										
1	20	172	0			Sm, 233		0		
2										
3	25	178	0			237, 234		0		
4										
5	30	192	1			N 400, 209		0		
6										
7	35	269	0			275, 230		1		
8										
9	40	154	1			262, 230		cont-1, 1		
0										
1	50	142	1, 3			284, 140		3, 3		
2										
3	60	144	2, 0			missing		4, 1		
4										
5	70	Sm	0, 4			122, 181		3, 0		
6										
7	80	116, 126	3, 1			Sm, 196		1, 4		
8										
9	90	165	6, 6			191, 198		4, 4		
0										
1	100	138	5, 4			176, 150		7, 0		
2										
3	110	140, 80	7, 6			N 350, 208		6, 6		
4										
5	120	140, 143	6, 5			223		2, 3		
6										
7	150	576, 599	68, 80			410		73, 64		
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										

From D Sm B₁, replated on B Gal:

	total	Gal +	tot
0	45, 27	0, 0	0/72
30	51, 59	0, 0	0/110
70	32, 25	1, 1	2/57
90	57, 69	5, 2	7/128
120	48, 32	4, 0	4/80
150	85, 77	13, 11	24/162



19 June 14, 1958.

REF: 1408/12

	1	2	3	4	5	6	7	8	9	10
1	<u>Hfr transductions of gal, try.</u>									
2										
3										
4										
5	ORC cultures, W 1895, W 3953. 1 ml + 7.5 ml 1 ³ / ₄ rot.									
6	Spun, resusp. in chilled water 2 ml each tube (4x),									
7	mixed 6+6 ml (A) and 2+2 ml in another tube (B).									
8										
9										
0										
1	(A): sampled at 0, 30, 60, 90, 120, 130, 140, 150, 160, 170, 180, 210, 240									
2	0.5 ml + 2 ml chilled water, blended, plated .05 on									
3	M gal for Meth try.									
4	D Sm Meth									
5	S gal for Meth									
6	and also .05 on D Sm B, Meth									
7	<u>poured.</u>									
8										
9										
0										
1	(B) blended at 60', 120', 180' and sampled at 120', 150', 180',									
2	210', 240'.									
3										
4										
5										
6	O': From mixture in ice bath, dilute 1:5 in water as									
7	the other.									
8										
9										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										

1895 ♂ M
3953 ♀ T

19

June 15, 1958.

REF: 1408/12

	1	2	3	4 Poured D ₂ for B ₁ with	5 B	6 & 7 not B together	8	9	10
	Time	D ₂ for B ₁ non blind blind		not be		Gal ₊ for B ₁ Gal ₊ Gal ₋			
1									
2									
3									
4	0	0, 0		1, 0	1, 1	0			
5									
6	30	7, 6		4, 5			1		
7									
8	60	7, 9		1, 4			1		
9									
0	90	9, 10		6, 4		1	5, 1		
1	120	7, 10	15, 9	5, 4	4, 2	1, 3, 3	4, 7, 10		
2									
3	130	6, 6		0, 1	3, 1				
4									
5	140	10, 5	2	1, 1		0, 1	3		
6									
7	150	8, 4	6, 8	4, 1	5, 10, 6				
8									
9	160	15, 15		5, 9					
0									
1	170	11, 18		6, 14					
2									
3	180	7, 9	19, 17	2, 13	10, 4	2, 0	7, 3		
4									
5	210	15, 11	9, 11	5, 18	7, 7				
6									
7	240	24, 23	11, 29	not made.		4, 1, 2	8?, 7, 14?		
8									
9									
0	W1895	0				0			
1	3953	0				1			
2									
3									
4									
5									
6									
7									
8									
9									
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									
0									

Counts too low — Experiment discarded
without further testing.
Lack of late entry due to what?

1970



19

June 16

REF:

1408/13

	1	2	3 ball +	4 M gal sm bi	5	6	7	8	9	10
1			3791			3772				
2										
3	Time									
4										
5	0		1			1				
6										
7	22		1			10				
8										
9	24		2			6				
0										
1	26		7			16				
2	28		10			11				
3										
4	30		23			38				
5										
6	32		30			59				
7										
8	34		23			75				
9										
0	36		110			63				
1	38		137			69				
2										
3	40		153			138				
4										
5	42		193			203				
6										
7	44		281			72				
8										
9										
0	46		0			1				
1	48		0							
2										
3										
4										
5										
6										
7										
8										
9										
0										

Partial reversion to T- of 2870
2 sp. from out of 22 on medium test



19

June 16, 1958.

REF:

1408/14

1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0

1 2 3 4 5 6 7 8 9 10

Gal timing, H_{pr_2} / Gal 7, 4, 8.

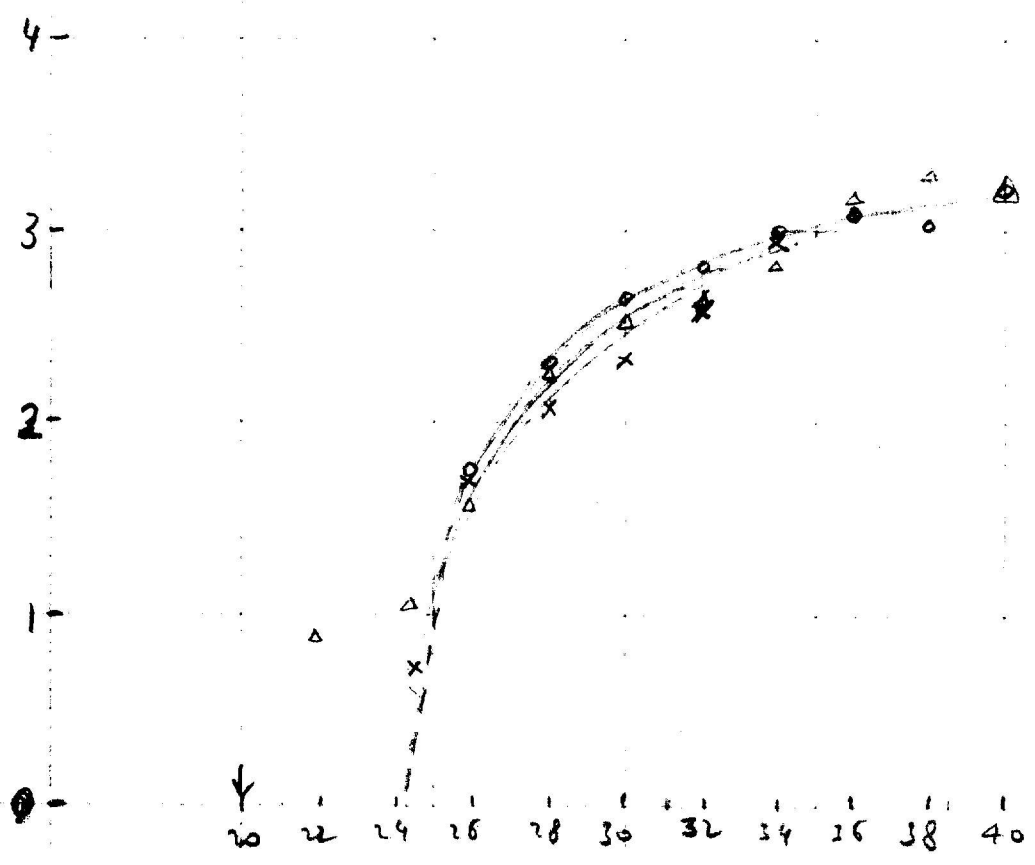
ORC of W 3994, 3997, 3998 δ^R . W 3870 from slant
 Sp 1 ml + 7.5 ml Pen, 1^h 30' rotation. Spun, resusp to same conc.
Mating mixture : 15 ml δ + 5 ml δ in flask.
 (prewarmed)

Samples of 1 ml diluted with 1.5 ml of chilled DW, taken
 at times: 0, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 50, 60'.
 Blended and plated, .05 on Mgal B, Sm.

Also: controls of parents, same conc. as for cross.

Note: 34' for Gal δ , diluted in 3 ml instead of 1.5.

1408/14



oooo Gal 4 (vis II)
△△△△ Gal 7 (vis II)
×××× Gal 8 (vis I)

CISTRONS

I II (III) IV?

kin → Transf. → Epim.

Gal₂ Gal₁

Gal₃

Gal₄
Gal₆
Gal₇

Gal₈

Gal₉

22

Lp Gal_{1,6} Gal₂ →

Experiments:

1408/9 :

← Try Lp Gal₆

← Gal₆ Lp

} Gal₆ closer to Lp.

1408/10

Try Lp Gal₂
Lp Gal₂ Gal₆?

← Gal₂ Lp

1408/13

1,2

Gal₂ Gal₁

1408/14

4,7,8

← Gal₄ Gal₉ Gal₈

Lp (Gal₆ Gal₁) (Gal₄ Gal₉) // Gal₈ Gal₂ →

1408/15

2,3,4

1408/16

1,2,3,5

1408/17

1,2,8

1408/18

2,4,6,9

/19

2,5,7,8

1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6
7
8
9
0