(49) Total Review of pedigree expts.

APR 18 1956

Exp.		1954	SW66
1137	✓	2-15	12
2	✓	16	12
3	✓	17	12
4	✓	18	12
8	✓	3-1	967
41	✓	9	12
42	✓	11	960
43		16	60
44		17	60
47		30	60
49		4 2	60
50		12	60
51		14	22 × 578
36		2 23	12
37		26	→ × 967
40		3 [illegible]	92
46		3 19	9 → × 967
48		31	60

Tabular resume of pedigrees.

APR 19 1956

a = minimum interval of branching.

Exp. □ Initial.

Interval of latest branching | interval of termination

a b c d

how many intermediate branches.

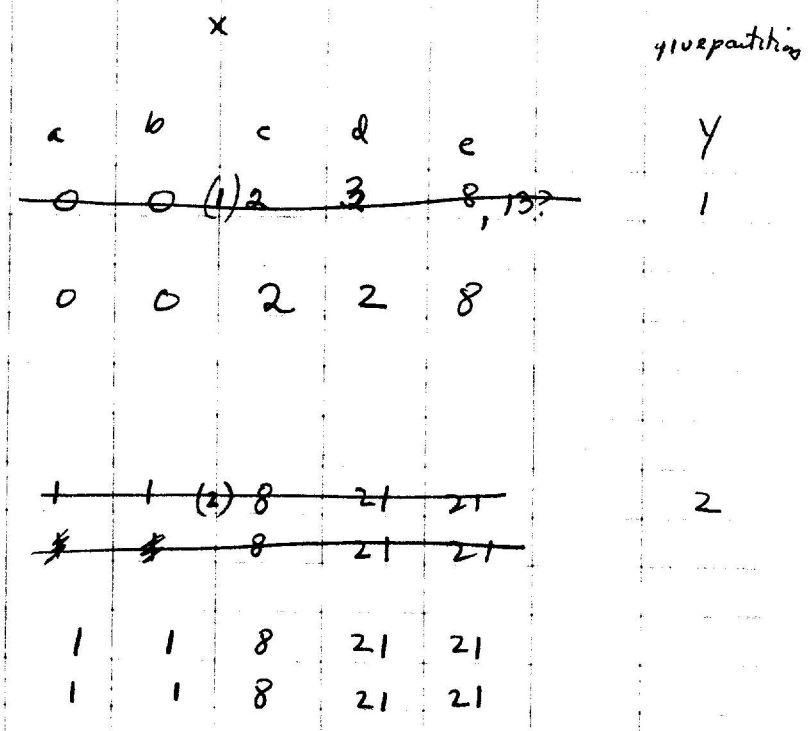
max. yield per branch.

APR 19 1956

#			a	b	c	d	followed e	Yield.
1131	CD	followed 3 generations. All cells became immotile. Separated at n_3, 1 cell gave a swarm; D3. the others non motile clones. On further isolation, D3 was mixed → 12⁻ : 8⁺, the latter all i, the former x — FA10 → b.	0	—	—	—	1sw/n_4.	1sw.
	C5	all nm at n_{13}	0	13 (8)	13	13	13	1
	B5	" "	0	13 (8)	13	13	13	1

APR 19 1956

1132 E5 Unicat. 2 divisions.
8: all⁻ at n_3, and at n_8



D5. dicat, branch at n_1.

APR 19 1956

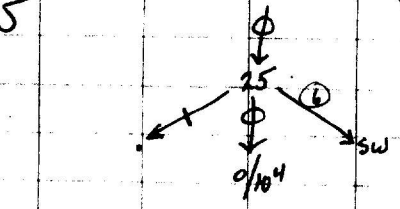
		a	b	c	d	e	Y.
1133	E5	pure swarm late isol.; 1/4 inv. 3/4 → N_1^i					1 sw
	D5	test for swarm essentially + → + →. + ↘ + →.	1	≠ 11	11	13 11	11 ≠2
	C5	+ + − + − −	0	0	∅	∅ 13	2 1
			0	10	10	10	10
	B5	+ − + +	0	10	10	10	10

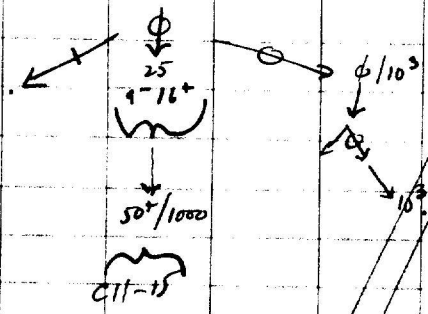
(P) in notes

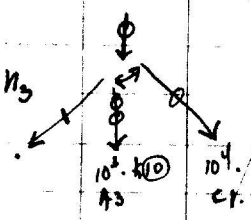
APR 19 1956

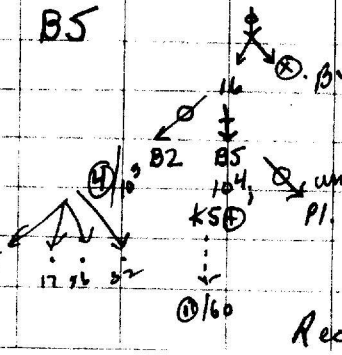
how many + at this time

		a	b	c	d	e	$Y_{int.}$
1134	c3 (P)	2	5	(3) 15	–	15	1 [redacted]
				15	–	15	1
				21	–	21	1
	D4 (P)	0	0	(1) 4	–	4	1
	E5 (P)	[redacted]	5	(18) 18	–	18	1
				(6+)			swarm
	c5	0	1	(1) 23	33	33.	1
	c4.	N1 —	5	(12) 16	26	26	1
			10	(50) 10	18	23	
			10	10	18	23	
			10	[redacted]10	19	29	
			10	X			
			10	11	18	23	2
	A3.	C1. —	3	—	16	16	1
		A3 6	—	—	—	16	10
	B5	D4	lost at n_1				
		01	6	14	14	18	27
					14	20	27
					14	19	33
					17	—	17







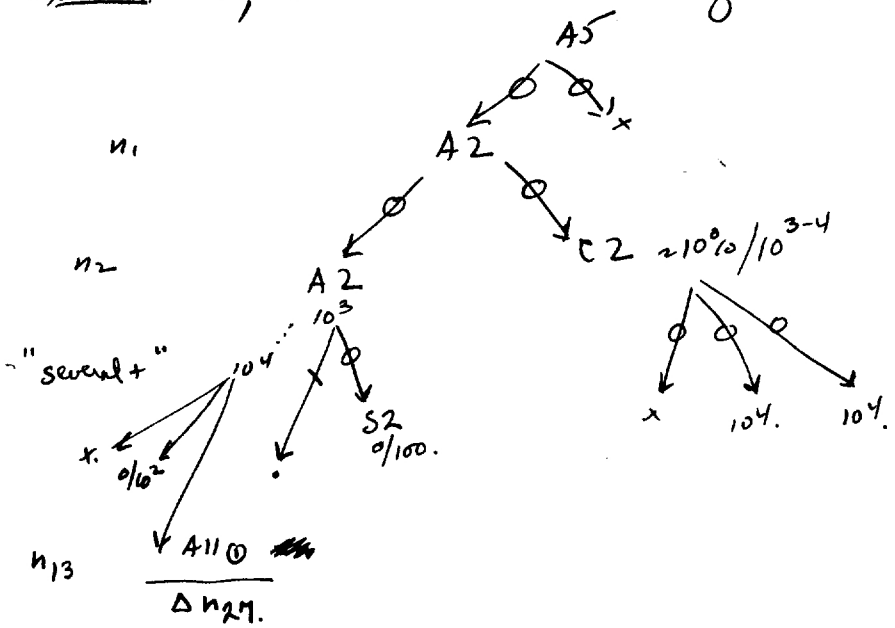


B5: "≤1%+/10⁴"

Record these after P1 was diagnosed as chain. (Fun)

Note: 55 was mistakenly diagnosed as a swarm as a first ex. of a plurivalent clone. Exact number not specified. 5 isolated. P1 was taken as an early sample

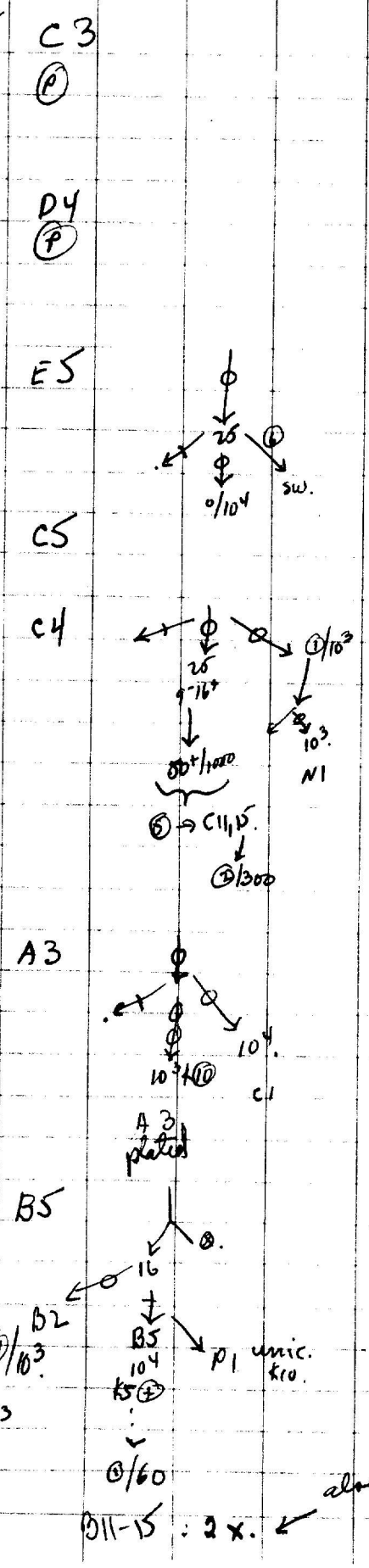
- translate P1. cell isolated at n_{22} was a chain for at least Δn_{19} and seen again at $n_{39,42}$ as no motiles. The chain had sibbranches between n_5 and n_{22}. a should read, ~~earliest~~ latest time that branching must have ceased for that chain.



No counted.

4/21/56.

1134



	a	b	c	d	e	Y
D1	3	5	15	—	15	3
D2	3	5	15	—	15	
D5	3	5	21	—	21	
	0	0	~~4~~	—	4	1
	1	4	5	17	17	1+sw.
	2	→			swarm	
	0	0	23	33	33	1.
	4	5	16	26	26	
	6	10	10	~~18~~	24	
	6	10	10	18	24	
	6	10	19	27	27.	
	6	10	~~18~~ x			
C15	~~11~~	~~18~~	~~18~~	26	26	
	3	3	3	17	17	1
	6	13	—	—	13	10
B4	1	x				
P1	5	13	23	33	33	
01	6	14	18	—	25	
91	6	14	14	18	27	
2	6	14	14	20	27	
3	6	14	14	19	~~33~~	
	5	13	—	21	21	
	5	13	—	21	21	
	5	13	19	—	17	

4/21/56

1134 A5

see for partitions ⑩ '10:10?

terminal word.

	a	5	c	d	e	x	y
A5	1	—	—	—	1		
52	6	12	12	19	22		
A11	6	15	42	42	47		
12	6	15	x.				
13	6	15	—	22	22		
D11	6	14	x				
12	6	14	—	27	27		
13	6	14	—	27	27		

A4

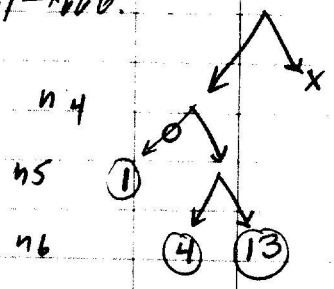
see ⑩ for tokens and terminal stations

	1	5	12	—	12	2
	1	5	20	—	20	

4/21/56.

1138
B4

967→666.



	a	b	c	d	e
F21	5	5	44	45	51
			19	28	28
D22	8	15	~~18~~	~~19~~	~~28~~
23	8	15	~~18~~ 19	~~24~~	~~31~~
24	~~8~~	15	32	44	44
E24	8	15	28	28	38
A21	10	16	18	—	18
22	10	16	19	32	32
23	10	16	17	29	29
24	10	16	32	-	32
25	10	16	31	35	42
B22	10	16	32	—	32
23	10	16	17	29	29
24	10	16	19	26	26
25	10	16	33	38	38
C21	10	16	20	20	30
22	10	16	19	32	32
E21	10	16	29	~~34~~	39
22	10	16	44	50	54

4/21/56.

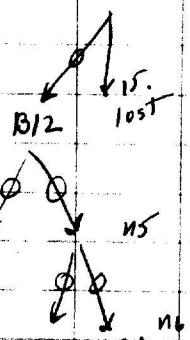
V.S.

1138

	a	b	c	d	
F21	5	5	44	—	44.

967 + 666. most lost.

B4:



-chain
Δn = 39
=

D22 A 21-25
23 B 22-25
24 C 21-22
E24 E 21-22.

E21 n_{13} → B32 term.
E22 n_{13} → B33 n_2; n_8 → E31 → n_1, n_1, n_1 E32 $n_2 < n_6$ can't to n_{10}.
E23 n_{13} → B34 $< n_5$.
E24 n_{13} → C31 term.; to minimize.

A21. unicat n_2, ⇔ C23
A22 " n_3 C24
A23 " n_1 ; term < Δn_{13}
A24 " n_3 ⇔ C25.
A25 n_2 → D25
B22 n_3 ; n_{13} → A31 ×
B23 n_1 ; term < Δn_{13}
B24 n_3 < Δn_{10}
B25 n_2 n_2 E23
C21 t.f. n_4:
C22 n_3 ; < n_{13}
C23 ① — lost
C24 ① < n_{13}
C25 ① n_{13} → A32 ×
~~D21. E24~~
D22 n_4 , < n_{13}
D23 n_4 → B31. term < n_5 to n_{12}
D24 n_3 n_{13} → A34 n_1 term < Δn_{12}
D25 n_{13} → A33 Term. < n_4 to n_{11}

recover for tabulation.

1141 — 13 mit. 1E (33)

3 died
1 lost
8 E.

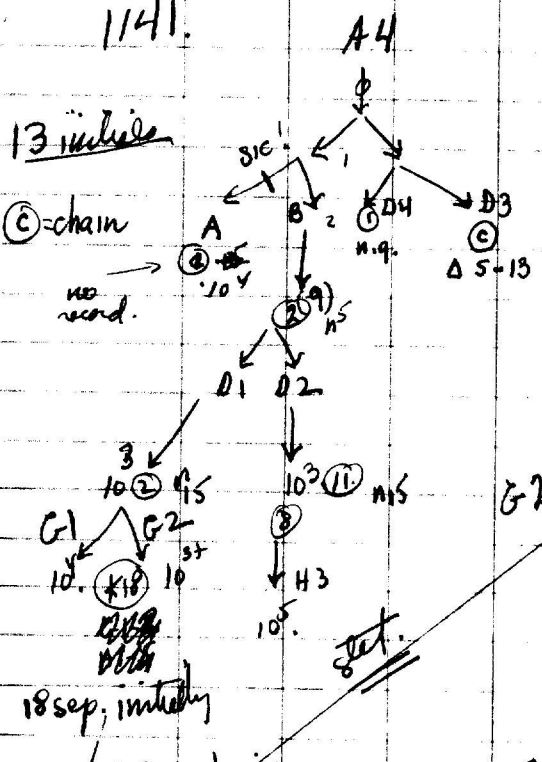
4-22-56.

1141.

13 include

Ⓒ = chain

no record.



see		a	b	c	d	e
A4	A	2	2	15	—	15
	D4	2	—	—	—	2
	D3	2	2	7	13	13
	B1	2	2	16	29	29
	g 1	19	27	28	32	32
	2	19	27	28	37	37
	3	19	27	28	40	40
	4	19	27	28	32	32
	5	19	27	27	32	32
	h 1	19	27	28	32	32
	2	19	27	40	47	50
	3	19	27	29	29	× snake
	4	19	27	28	41	41
	5	19	27	28	41	41
A3	8 cells.	8	15		29	29

persisted Ⓘ n.q.

Partitions
1:1:1:30
1,2,18

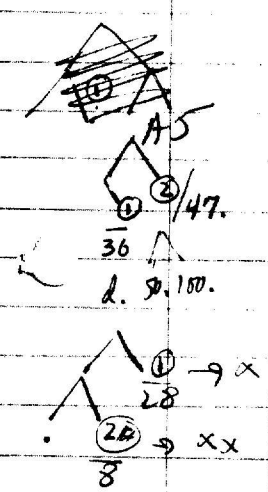
C2

1. 8. 16. 22.

a	2	2	6	6	11
b	2	2	7	7	20
c	2	2	5	5	18
d	2	2	2	2	15

d. d.

1A1	Ⓒ	d after 1 fission	1	—	—	—	1
B5	Ⓘ	n.q. — persisted 48h. consists.	0	—	—	—	0.
A3	Ⓘ	died overnight	0	—	—	—	0
A5			1	5	—	—	5
			2	5	—	11	12
			2	5	—	12	18
B1			0	0	1	2	1
B2.			no data				
B3			0	0	1	1	15



APR 24 1956

1141A4.

	a	b	c	d	e	
A4A	2	2	15	—	15	
D3	2	2	7	13	13	
D4	2	—	—	—	2	persisted n.g.
H3- D2 (8 cells)	8	15	—	29	29	
G1	6	16	—	29	29	

a	b	c	d	e
19	27	28	32	32
19	27	28	37	37
19	27	28	40	40
19	27	28	32	32
19	27	27	32	32
19	27	28	32	32
19	27	40	47	50
19	27	29	27	x sm.
19	27	28	41	41
19	27	28	41	41

G2 K18 ①

H2

An alt. interpretation, 1141A4 for G2 subset →

	a	b	c	d	e	
H2.	6	16	31	—	31	

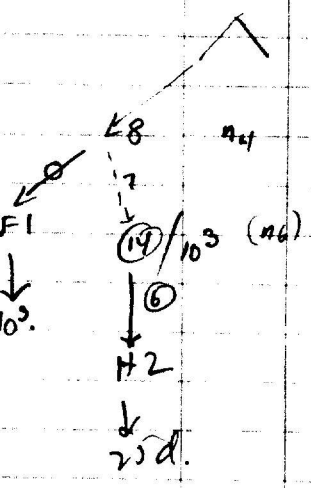
1141B4 : G2 series

13 21 etc.

subtract 6 from above.

APR 24 1956

1141 B4.

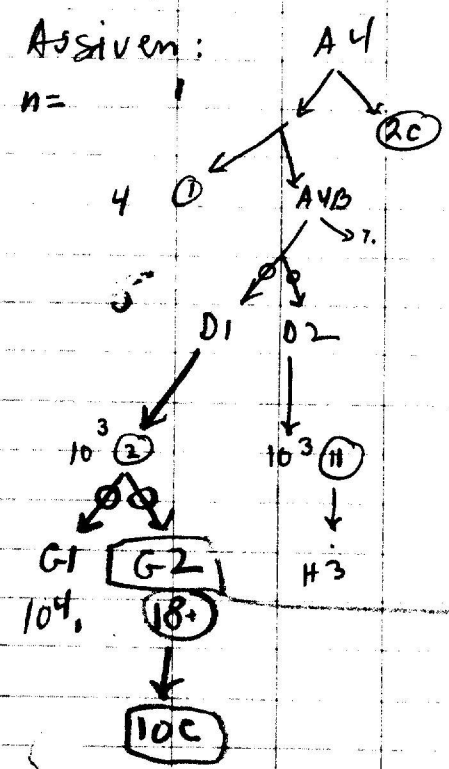


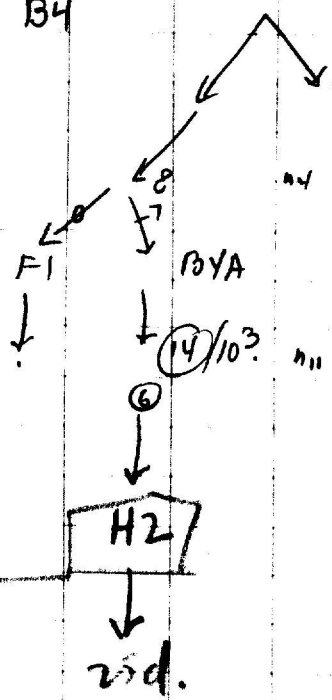
	a	b	c	d	e
F1	4	—	—	14	14
H2	6	—	—	—	6 (lost by dying).

Note: notes are confusing on the G2 - H2 sequence of A4:

Note 14: partition.

A4 and B4 pedigrees may have been mixed at G2 ↔ H2 so following interpretations are ~~possible~~ indicated. This seems





An account of H1, the given interpn. seems most likely, but it would be recorded with reserve.

APR 28 1956

1142
60 → 666
1/2 for plating

No early separations: survey of yields of ①.
A1-5 B1-5 } ⑩ were ess. inoculable.
C-D followed EBG plated.

Yields at first examination	+	/ tot	$\log_{10}$
c2	2	2⁻	
c3	>50	3	
c4	10	3	
c5	1	4	
D1	>100	4	
D2	3	3	
D3	0	3	
D4	0	3	
D5	1	3	

		a	b	c	d	e	
C3	c3 / c4 / c1	6	10	10	23	23	…
	c2	6	10	23	29	33	
	c5	6	10	31	37	41	

C3 → ⑩/10^3 → ⑤ → 105: C1-2-3-4-5
10⁴. ①/10⁴ 10⁴. 10⁴. ①/10⁴

106: C1 → 50.
C2 → ①/100 → ①/2 + 50., 10^3.

D1 → >100/10^4 → ⑩ → 108

105 D,E (1-5): 3: 10^4; 1: 0 (⑤4); 6: 10^4/①

D2	C5	0.
D5	B5	4.
F1 →	B1	78.
F2 →	B2	8.
F3	B3	50.
E3	B4	50.

D1	(3)	7	13	–	26	26
	(1)	7	13	14	–	14
		7	13	26	–	26
		7	13	26	28	36
		7	13	26	31	36
		7	13	26	29	36
		7	13	26	31	36
		7	13	26	31	36

Platings: 16 "cells" plated → 9 grew: 1 swarm, 3 mini-trail, 5 colonies

↓ residues

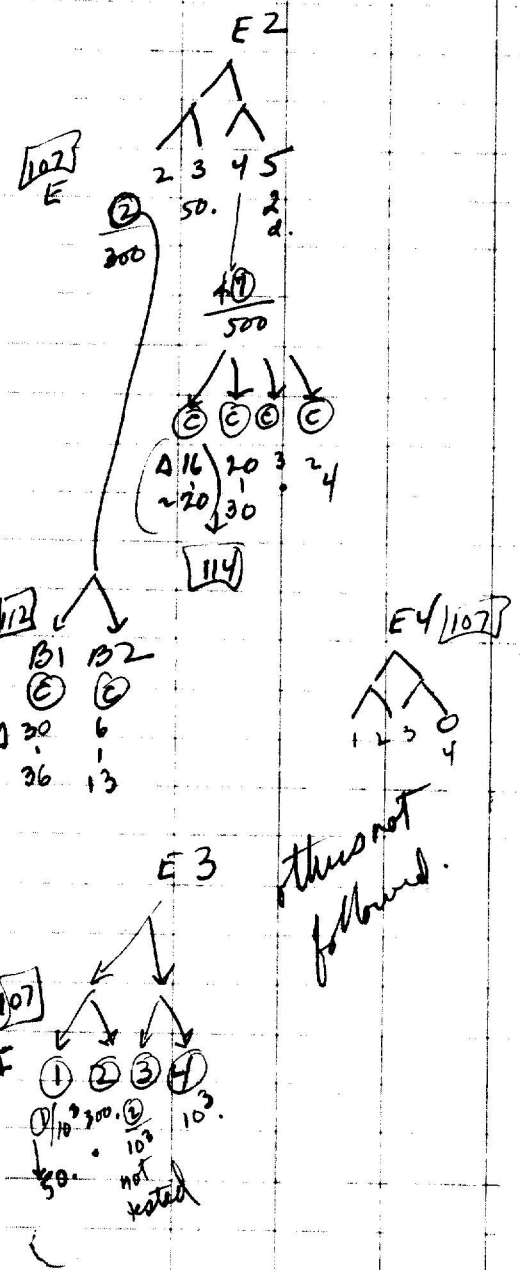
E3: swarm
F-2 ⊕/− and 2 more }

4 not transferred (1 swarm)

1143

Plating: ~~14~~ 14/16 hd dup colonies; no TorS.

110 E1-5 → 107



	a	b	c	d	e
	~~10~~	~~40~~	~~46~~		
	~~40~~	46			
	3	10	40	46	46
	3	10	16	23	23
E3	2	—	—	8	8
E4					
E5	2	—	—	3	3
B3	~~3~~ 3	11	27	31	31
4	~~3~~ 3	11	34	41	41
5	~~3~~ 3	11	14	17	~~19~~
C5	~~3~~ 3	11	—	15	15
F 1	2	—	—	12	12
~~2~~	2	—	—	10	10
~~3~~	—	—	—		
1	2	2	12	18	18

1144 B4

A B
O
↓ 14. + make
$11/50

A	B	C	D	E	F	G	H	I	J	K	C.
0	(15)	0	0	0	(3)	(2)	(1)	(1)	(4)	(1)	2[8] each

n_7

n_{15} ←

V.i.

A1
A2 (3-8)
A3 (5-6-16)

A40 D2 C1
A50
3-8-8
(B5)

B1 --4-8.
B2 6-12-12.
B3 --6-6
(B4)

(C2)

C3 ①/n_5
C4 n_6.
C5 ①/n_5
D1 71.
D2 n_5 n_8.
D3 — n_6 n_{10}
D4 — n_5 n_{10}
D5 — n_4 n_{10}
E1 - 22-28-78
E2 · n_5 n_5
E3 · n_4 n_7
E4 · n_4 n_7
E5 · n_5 n_9
F2 · n_5 n_9
F3 n_5 · n_{11} n_{11}

$[\bar{x} = ①/2^x]$

Σ 34-38-39 C2 n_6 $\bar{n}_1$ $\bar{n}_6$ $\bar{n}_1$ [H3] (n_{32}) $\bar{2}$ $\bar{1}$ $\bar{5}$ [H1] ([115]) $\bar{1}$ $\bar{1}$ $\bar{4}$ [G2] $\bar{2}$ $\bar{2}$ [F2] $\bar{1}$ $\bar{1}$ 4 5.

Σ 21-23-31 B4 $\bar{10}$ $\bar{1}$ [H2] (n_{32}) $\bar{5}$ [I2] $\bar{1}$ $\bar{4}$ [H2] n_2. n_{10}.

Σ 37-37-37 B5 $\bar{5}$ $\bar{7}$ $\bar{3}$ [H1] (n_{36}) $\bar{7}$ [I1] $\bar{1}$ $\bar{3}$ [H3] $\bar{1}$ $\bar{10}$ [G3] 0

But see notebook for missing items: How K → C2

But acc to notes, {C2 is n_{27}, H3 = n_{32}} { }

other clones OK; there must have been an n_3 interval between K → C2, H3 ; H $\xrightarrow{n_5}$ B5

114434 any other summaries?

5/2/56

			a	b	c	d	e	
(11) isolat n_4			4	4 cells 0.				
	H	B5	5	7	44	44	44	died at n44
	I	C1	5	7	10	15	15	
	K	C2	5	7	41	45	46	
(27)								both d.
(2) isolat n_{15}	G	A4 A5	8	15	—	—	15	
(3) isolat n_{15}	F	A1	9	15	—	—	15	✓
		A2	9	15	18	23	23	
		A3	9	15	20	21	31	
(4) " " n_{15}	J	B1	9	15	—	19	23	✓
		B2	9	15	21	27	27	✓
		B3	9	15	—	21	21	✓
		B4	9	15	36	38	46	✓
(15) " " n_{15}	B	C3	11	15	27	32	32	
		C4	11	15	—	21	26	
		C5	11	15	20	25	25	
		D1	11	15	—	21	25	
		D2	11	15	—	20	23	
		D3	11	15	—	21	25	
		D4	11	15	—	19	25	
		D5	11	15	—	19	25	
		E2	11	15	—	20	20	
		E4	11	15	37	43	43	
		E3	11	15	—	19	22	
		E4	11	15	—	19	22	
		E5	11	15	—	19	24	
		F2	11	15	—	20	24	
		F3	11	15	20	26	26	
Isolated at n_8, n_{15}	H	B5	6	7	59	59	59	
	I	C1	5	7	10	15	15	
	K	C2	5	7	52	56	57	

3/30/56.

11/4/ 8 clones started

[109] A2
① 52
d.

A5
① 26
10^2.
10^4.

B1
⑩ 50
⑯ /100.
not pursued!

B2
⑩/25 ns
$0/10^3$
+8 10^3
+6 10^3
+1 .
not pursued.

Note partition.

A3
②/64
① 300 ① 200
D1 D2
[114] G1 G2
150. 60.
10^4. 10^3.

B5
③/57.
lost.

B4
See next page.

	a	b	c	d	e	
A2	0	0	6	—	6	
A5	0	0	5	12	17	
B1	3	—	—	—	—	
B2	5	15	—	—	10	① → 0
	6	15	—	—	15	① → ①
	8	~~7~~ —	not isolated			① → +6
	8	—				① → +8

B3 Pure swarm Pure gm saved.

	a	b	c	d	e
A3	1	6	14	21	27
	1	6	14	20	24
B5	2	6	—	—	— 3 cells lost

5/2/56.

1147

This expt. "designed for swarms; did not search diligently for oligocolonates.
• = 0 or 1 or 2 Fla+.

35 Fla+ [118] 3 n. 9. 4 swarms; 1 48/200 G3; 19 few (+)
8 few or no (+).

[SWARMS:] (2 hours)

B4: pure motile
G1: pure motile variable expression. Question of phenotypic variability.
H2:
H3: both pure S. low manifest

		a	b	c	d	e
H2 → F1	ratio	2	14	–	24	24
	s/b	about 1–10% Fla+ swarm.				

count 1/5 - key pregnancy test
∴ ≯ 20% + in H2B.
at least 2 generations segregation. cf B4, G1, H31 not segregating, esp H3.

H2 B
(2)/10^4 (100)/10^4
(1) (1) (20)
119F1 F2 sw. not yet
10^3. 10^3. passed
some +, some - definite

Note: some late isolates had 50% +, but were lost. These probably showed incomplete expression but late segregation not excluded.

F2
119E3, E4 (1) (2)
10^2 .d .10^3

Expl. nonsyn? (esp. H3)

118 G3 48/200 typical incomplete
(8)
750/10^4
119F4 (20)
121F3 (X2)/10^4

1148

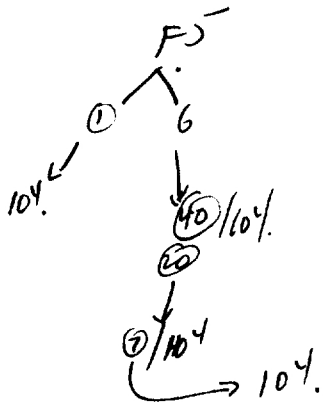
10 cells: 2 ng
2 ⓪
4 ~~2~~ ①
2 plus cat

B1. ⑩/300

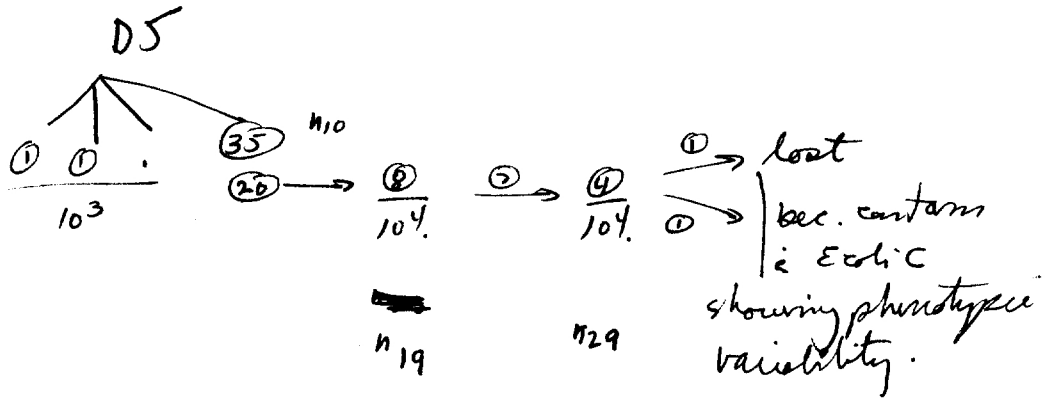
B4. ~~39~~/10^3. no putter data.

Cat
120

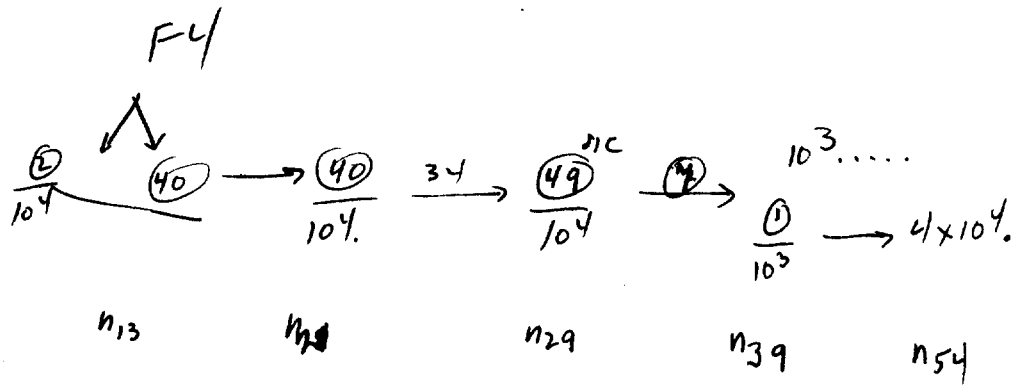
1149



Not contains whereas right chains



Remarkable problem of variability in F1a+ clones



1149

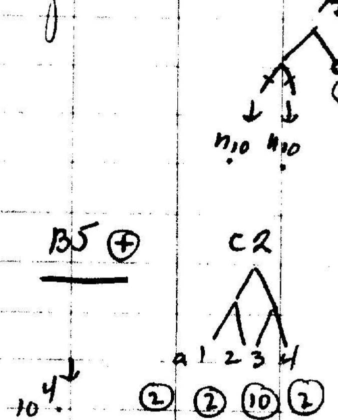
122 → 123

intended to separate early descendents so making to handle. primarily for segregation of clones.

37 ① → 2 swarms B5 F5
pure pure

⑪ → Swarm Z1.
(or few?)

gave no ⊕ at n_{10}: A2, A3, A4, A5 B1 B2 B3 B4 C1 C3 C4 C5
D2 D4 E1 E2 E3 E5 F1 G1-G2 G3 G4 H2 H3 H4
(marked ✓ = "uninteresting") = 26 clones.

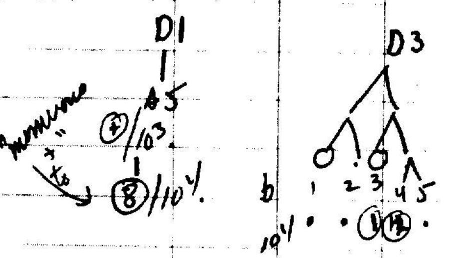


These pedigrees generally are not useful except for partitions as no intermediate isolations were made. Note 2 pure swarms. Some late isol were lost.

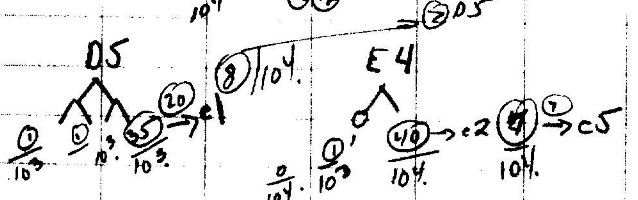
No indication of late replications.

Partitions at 1st div.:

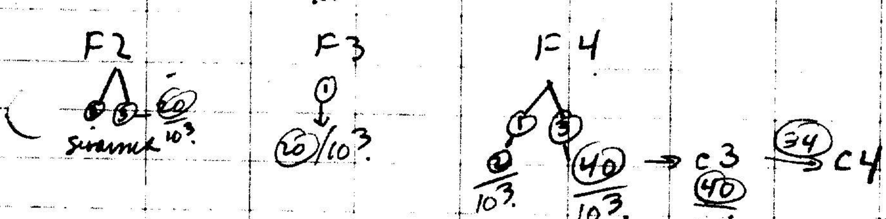
2 : 0
2 : 2 : 2 : 10
0 : 0 : 1 : 12
1 : 1 : 0 : 35
1 : 40
2 : 20
2 : 40



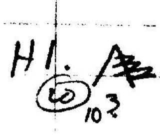
sw: pure
sw: pure



(return F4 a 6 b 39 c — d 54 e 54)



F5 sw. ⊕
pure



11/9/13 Crossovers among tail ends.

35 from 11/9 x-FA60, x-FA90 → (nly b)

F1 H5 D3 F2 all ++

but 60C dubonis lysate as it transformed 967!

Found that SW967 is lysogenic on SW661 for a → x phage

1150

60—X666

Isolates at 2½-3+ hours. 40 isolates

(134) A2 < pure swarm. Divide at n_1, n_2 when possible. Patches or yields.

↓ 126

No further pedigrees.

at n_{10+}

A3	1 : 1
A4	1 : 0 orig mot
A5	① ①
B1	0 2
~~B2~~	~~④~~
B3	① ①
B4	① ①
B5	①
C1	③ ①
C2	① 0 orig nm
C3	③ ①
C4	③ ①
C5	① ①
D1	① 0 0 0
D2	①
D3	0 0
D4	0 ①
D5	① ①
E1	① ①
2	① 0
~~3~~	~~④ ⑧~~
~~4~~	~~4 ④~~
~~5~~	~~① ④~~
~~F1~~	~~④ ④~~
~~F2~~	~~30~~
~~F3~~	~~① ①~~
4	① ③
5	⑤
~~G1~~	~~..... ① 12644~~
2	① 0
3	① ②
4	①
5	①

H1 ① ①

0 0 orig ①

① ②

④ → H3 126

②

Interesting patches

E3

④ ⑧

E4

⑦ ④ 12662

⑬

A1

① · ㊸

F3

㉚ ⑥

E5

① · ⑳

H4

㊿.

G1

㉖

F1

④ · ㉗

B2

⑫

Are pluricatenates delayed?

5/16/56.

—× paralytics

TM 2 × SW578. Most ⊕ proved invable, and motility sluggish..

~~4=5~~ 16 INV.
10 → 140 ⊕/10^3.

3: c clones

B1 ~~2=3~~ 5 /10^3.

C1 ~~3 MH~~ 7 /10^3. These ⊕ proved very sluggish + could not readily be followed.

E 2 ⊗ /10^3.

F 1 ② /10^3.

also reveales on stability of Fla^+ in E coli C.

at this point these expts. were interrupted for pair isolations.

5/22/56.

1212
Resumé

Reorientations and splits, early.

17 isolates. A - x.

	Splits at n	n		n		n	Σ n
A1.	3, 3	1					6
B1	1, 1	1					2
C1	7, 6	1	7, 0	2			13, 7, 6
			4, 2	2	3, 1	3	
B3	6, 3	1	6, 0	2			9, 6, 3
			3, 0	2			
D1	7, 4	1					11
E1	1, 1	1					2
F1	1, 7	1					8
G1	1, 1	1					2
H1	4, 2	1	3, 1	2			6, 4
C3	lost						—
D3	mf						—
E3	2, 0	1					2
F3	swarm save. (prob pure)						sw. no seq?
G3	1, 1	1					2
H3	4, 1	1	2, 2	2			5, 4
B5	~~1~~, x	1					—
C5	24, 2	1	21, 3	2	20, 1	3	26, 24, 21, 3
					2, 1	3	

5/16/56.
5/27/56.

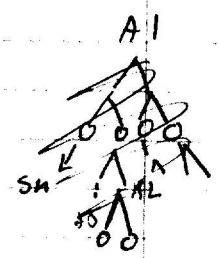
notes

Recapitulation

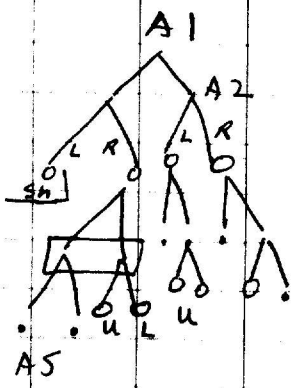
(18 real from 22 → 666 (3 hours)

37 → 666

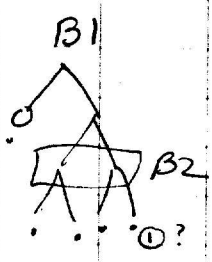
count substances at n_{10}.

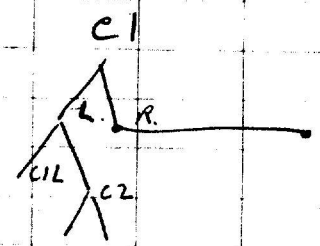


no + at n_{10}.



F3
swamp.
prob pure.





ch.

See protocol sheets.

Significant patterns.

A1: (3) (3)

B1: (1) (1)

C1: 4:6

4:0 2 4

1 3

at n_1 unless indicated.

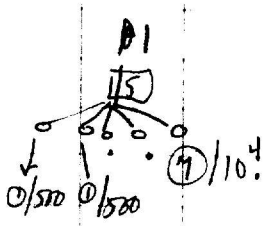
B3: 6:3

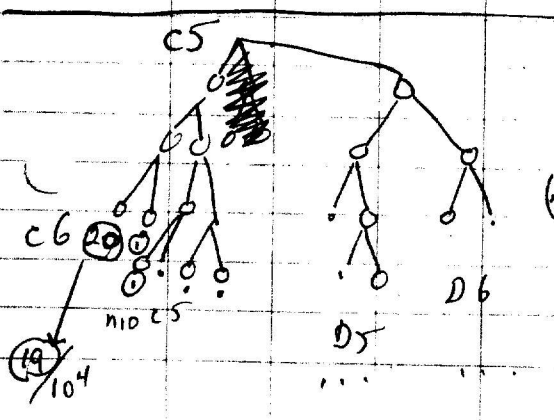
H1: 4:2

H3:

C3 1:1 C

4:1





24 : 2 n_1

(21 : 3) n_2

(20 : 1) n_3

5/27/56.

1212 → early partitions

1214 ~~calibrate loop volume~~. + trails in motag. no trails, only clusters.
ratio of trails to swarms FA37 × SW666

		Exp 5	6		
Σ spots (diluted)	0	27	11		
	S	2	10		
	T~~S~~	2	6		
	T+S	1	3		
		32	30.		
total T		3	~~10~~ 9 }	~~12~~	12
S		3	~~9~~ 13 }	~~16~~.	16

In these conditions, S > T. (question of earlier data). See 1216

1215 - First platings of SW666 in dilute motag

1216 SW967 × ; plating & dil. agar. noted satellites.
BOOS* 16 horiz trails with 30-54 colonies per trail
vary motag. Not reliable. Looked for evidence on non random
distr trails per spot.

2/5/58 .1217 → ~~early partitions, plate~~; Clones from undivided initials; plate
1218 Deconseq
1219

5/27/56.

1212 → early partitions

1214 calibrate loop volume. +trails in motag. no trails, only clusters.
ratio of trails to swarms F#37 → SW666

Σ spots (diluted)		Exp 5	C
	0	27	11
	S	2	10
	~~T~~	2	6
	T+S	1	3
		32	30.
total	T	3	~~9~~ 12
	S	3	~~13~~ 16

In these conditions, S > T. (question of scaling data). See 1216

1215 - First plating of SW666 in undiluted motag

1216 SW967 → ; plating of dil. agar. noted satellites.
BBDS* 16 short trails with 30–50 clones per trail
vary motag. Not reliable. Looked for evidence of non-random distr. trails per spot

2/5/57 1217 → ~~calculation, plate~~ Clones from undiluted initials; plate
1218 Dressing
1219

5/27/56.

~~1219~~ – 1221 – 1222

1219 SW967 x—50B. ① effect of extra cells ② trails per initial.

added	initials	Grew	trails
–	17	13	1
SW666	17		1
SW967	16		3

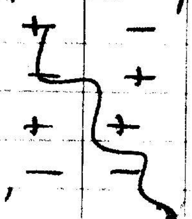
} 5T/50 initials

No decisive difference.

~~58~~ isolates

1221. A) ~~[illegible]~~ initials planted out. A C E G
58 Also kept in oil drops. 34 viable → 4 trails motag.
~~24 [illegible]~~

Guerin. expect. res. drops



Also, 48 initials formed clones,

following had ⊕ at n_{10} 0^{39} ....; 1^{4}; 2^{3}; 3^{1}; 20^{1} ∴ 1E/48.

Sign. of initial ratio of E so low! None of these gave trails. c/ $\frac{1}{48}$, 4/34 above.
No swarms.

44 initials → 1 trail rather old Motag.
17 " → 1 trail

1224 50—x SW967. Plate ^spread^ on motag. Initials pooled.
M & A 5T/12 colonies MA 0 T/14 cols. Hegh!
effect of spreading considered (spots before now).

1225 ditto. and contrast in residues.
a) 96 initials → 14 clones (low viability!) 2* plus cat...
b) 14 " studied ... → 1 trail
c) 2 complete clones (+?) spread out → small clusters under lenses.

1225

d. pool inoculated various ways, media

967x— 2x .01 ml spread → 90c, 8T
" not " 35c 4T
.02 " " —c 5T ∴ not effect of spreading
Spots from pipet 25c 4T. 16 3T. " "
" pre-spread plate 16c 6T 20c 1T

∴ No effect of spreading; rather variable ratios.

Totals: 202C 31T.

1226. Pool 895 initials + plate samples. Media diff'n stages.
967x—
altogether 38T, 138 colonies = 1/4.

In poor plates, 10/71 No difference.

also misc effects. possible φOH → 17/40.

1 trail: 125 colonies in 17 hours

later known: (But 967 has spont. "minors")

1227 40 initials to broth for plating in tubes + plates.
12/17 good clones No major trails; all show "minor".
+8 500–1000 some photographed
→ 1 trail
pooled: 19 → 14 flowering trails

1/20/75 = 1 trail/20 viable clones/25 initials

1228 – 9 – plated clones see 1237 summary. 1229. discovered that SW967 produced spontaneous minors. Other Fla did not.
– 30. – spontaneous mottles.

5/28/56.

1230: some clones from sp motile SW967. noted fluidity effects.

1231 all major trails occurred singly.

1232 dropped SW967 x—.

SW666 x— Plate pooled initials:

1233 plated clones.

1236 plated selected single clones
"Flares" also noted. Genotypic Fla+ are also immobilized in motag.

Cloneplatings

(problem of quiescence at large cell size

1227 SW967 x— Clones: 14 motag 100%.
1228 12 had major trails (uniquely)
1229 60 were viable (clone size ~ 150)
74 were plated. definite nonlinearity noted for first time. (tactic orientation is diffuse)

SW666 x—
1232 4/16/25 Major is single, but others clusters 2^6
1233 1/34/47 2^6
1234 6/15/48 Concurrence of trails! 2^{3-4}
"selected" clones (most active on mucin agar following).

1236 3/57 plated: floccy MGA. ~~2 21~~ not recordable.
1237

48 clones followed: ~~3~~ 4 swarms + single — and flare effect. 3 sibs tested, all 6 Fla- note ratios. (all 4)

In selected group 2/7/7 (grown before picking)
control 0/10 incl 1 swarm } expt to test "quiescent vs active" clones
2/17/17

Would S/T concurrence be obvious?

5/28/56.

1227 – 1237

pooled-initials: platings in motog.

SW967X — practically no swarms

1228	~~11/0~~	11/81/100
1229		24/198/200
		35/279/300

SW666X —

		SW	TRAILS	COLS.	Pool plated	
1232		1	27	159	202	
1233	B)	5	13	79	100	
1234	B)	3	30	149	200	
1236		7	5 Bct	172	190	
1237		15	11	173	185	old prepn.
		31	86	732	877	

character of swarms – any comment given – often too large to be readily studied otherwise.

1237 of 15 swarms, 8 were clear, 5 had single at center, 1 had c², 1 had 0%; % at near-center. We recorded attempt to isolate (see A)

5/28/56. 1238

FA37 x SW666

a) ~200 plated, but not incubated. Conclude 9 sw/157 cols/197 mor.
reduce fluidity effects.

155 {100 T 21 Cl 9 sw 25 1's / 175 mor. "many swarmers were centered Col T" Most trails in one plate.

Effect of agar on T/S.... 250 samples:

NB/25 ml motag. Input ~250

	Clust	Cols	T.	Sw.	Σ
0	2	53	2	2	59
1	2	55	1	0	58
2	–	59	2	3	64
5	5	46	6	0	57
7.5	18	39	11	3	71
10	11	19	19	3	52
0	1	159	3	11	174.

Also plated some clones see 1238 C1 photo for major + minor trails.
C 13 trails 4 contam. } all but C1 single only. } 9, 9, 2, 31 =(4)
D 8 trails 5 clones } 6 to 52 (18)
see protocol notes for clone sizes ↑

22 viable clones

1239
5/28/06.

plate clones in 10% MGA.

mutation not limited for these

a) MGA — 1 contains 12 blanks 16 all singles 2 swarms no def. 1-colonies; 2 large plaques.

b) MGA40 — 8 blanks 1 swarm + 4 1-cols.
6 all singles
1 11 trails (100; 30 elements). See photo 1239-6

see notes for clone sizes: from 11 to 225.

1240 used Wilson gelatin n.g. but have photos.
plated clones. 9 blanks 19 visible

also more platings
3 sw - 1 c T
3 sw - {1 T, 1 c}

a) 1 swarm + cols + trails. See for pictures + cluster sizes.

40 ⊕ to 10⁴. "No E" — too many cells.

1241 past pedigrees: saved 3 Fla⁺ clones.
49.

1242

(A:) Single cell clones plated in MGA+40%NSB

18 empty

7 swarms, all had additionally: 50 1's; 41's; 10 cols incl 5-6 trails; 20 trails, few 1's; 3 3's 2'; 100 singles + short clusters

1 was contaminant ∴ all 6 segregated!

clones on MGA:

8 clones most had 1's + 2's

#21: 61's 8 clusters 3-6 1 T^{35} 1 T^{10} ←

#37: 18-1 3-C 1T

#27: 6-1 9-C 1T

MGA+40 #11: 37-1 5-C 2 1 T (>10/t; 2 had 100, 150 sectors) phot ←

10#: >100-1

48: 50-1 20-30 profuse trails

16: 9-T 38-1

18: 12-T 3-C 38-1. phot

20: 1-T$_{16}$ 60-1

22: partly sprayed; 1/3 T 2/3 1

30: 16-T [80, 80, ...] 5-C 55-1 ← phot

32 7-T profuse; 1-C; 56-1

34 75-1

38 17-T 3-C 45-1

40 too crowded

42 14-T 33-1

incubated 15 hours.

6/7/56.

1242B
-C
-1244

B: plant cells in spent broth.
growth limited to 100-1000. 18 x amined

3 - 0
3 - 100 Fla⁻
5 - ① /100
3 - ② /100 each isol.

4 isol. { 30-1, 0, 40-1 }

C1-2-3 < 160-1; 1 fuzzy T8; 120-1; 2-T; all -1's

C14 1 (29)/1000
C13 1 (23)/1000 } plated ⊕ as is.
C6 1 (18)/1000
C5: 1 (10)/100 Plant individually

gave some linear but also globular trails.
see photogr. ⟸
no profuse seen. note doubling of trails!

C. Plate pooled initials

Readings? See photos 1244.
messy plates.

[1243]

Plate pooled initials various media.

	T	C	1	SW	Σ
MGA	88	12	9	5	114
MGA + 40% peneassay	129	0	8	12	149.

but MGA itself seemed soft.

Single clones
12 blanks; See protocols

1244

6/7/56.

1244

Plate 5b clones.

· 15 pairs: 24's

Trail distributions: (clusters as subs a.) x = no clone

3 - 11 - 1 - O_2

1 - O_1 - O_* - 2

0 - O_3

2 - 4

1 - 2

11 - x

0 - 0

0 - 1

x - 0

1 - 1

6 - 5

x - 1

x - 8

and more data of this kind. omit x-x (5)

some photos Note that agar is stiff.

6/8/56.

1245

37 – x 666 serum effects.

A) also noted that H_2O ok for trap medium as dilute nutrient.

B) 36 ⊕ pickled one completely inhibited by anti b or anti i.
overnight, clones in 6 serum: 1 weighing cell sol but n.g.

C) ~~35~~ 43 clones pleted. 35 viable mel 1 swarm (pure)
MOA60.
readings: ? see plots

6/8/56 [1246]

Serum inh of trails [b, c.]

SW666x – FA11; x – FA32 initials viol to 1:100 i, b serum.

b serum inhibited both very quickly; i after 30–90 secs. Therefore serum n.g. in this combination.

similar plating trials: no trails here either.

[1247]

Check serums for inhibiting of trails 37–x666

a	+
b	–
c	+
d	+
i	–
k	+
n	+
1,2	+
B-0	±

∴ used a for further tests on this point.

TRAILS ∴ i almost only serum which inhibits. i did not give inhibited swarms.

(FA76a) a → x SW666

[1248]

a { no inhibit b trails; part. " a/b } b { inh all trails } at 1:1000 as well as 1:100

E coli Fla⁻

note problem of no absolute Fla⁻; better to use serologically well defined Fla⁻.

6/18/56.

1250
1252
1256
1258E

a → × 566; serum effect: platings of ⊕

Confirmed b inhibit all
a partially inhibit all see photos

conclude all are initially inhibited, some terminals may develop b, non a phenotype. May be able to conclude that no fragments are Fla+ is b effect.

b (Minnesota) serum to check specificity; plating. 1252

10 → × 666 results as above.

see phot.

no further test of specificity available.

~~No exptl c a on nucleoids?~~ 1256

from 1252.

Tested residual ? tails in b serum. This would be one way of picking up Fla+ ex // Fla$_1^-$ H_1^a. There was probably area of hondiffusion of b serum. proved H_1^b.

Many + + + = seen.

1258E a serum as a → 666 initials: inhibition slow and incomplete.
Some aggl. pairs continue to swim.

1259D 3 or ⊕ each tested in a, b serum. a inhibited more slowly than b but initials all inhibited except c. 2% which persisted at all.
4 all persisted in b, 3 viable were swarmers.
2 a 0 viable.

Later intern isolates, e.g. B615 ⊕/a serum → 2 unusual motile. most others unmodified. Conclude some terminals not affected by a. while all initials are.

Correlation of initial motility & progeny; segregation in swarms

56 ① isol for microcolonies Examined for ⊕; underestimates

NG 13 swarms 4/+1 0/2^{13} 6 ⑨/2^{13} 2 2 >10/2^{13} 11

high incidence of ε

5 clones harvested for replating of intermediates ⊕.

B3
B12
c9
c1
D1 } 1's and v.s. tails only

D1 swarms. Replate residue: 8 sec/92 colonies. ∴ only ≈ 10% of sec. not tails from init isol.

Note: this clone scored as ⑩/10^4; must have had (10^3)/10^4!

∴ Take segregation ratios as:

	$F/a^+/F/a^+ + F/a^-$	
D1	~~8%~~	8/100
c2		4/47
c11		4/33
D7	~~100%~~	10% not repl.
D8		3/28

Note swarms were flared but not entered.

Note distribution of clones by ⊕ was

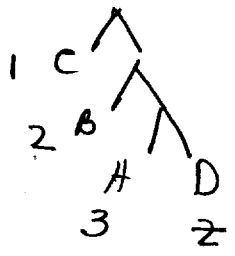
	inv	0 ≠ 1	2-5	6-9	10	>10	sw	Σ
Overall all	13	6 9	10	3	3	8	5	
scored as not active	2	1 2	6	0	2	1	1	

No obvious correlation between progeny + initial motility of method.

inv	0				sw	
broader clones. 13	6	22		11	5	57
2	1	8		3	1	15
—	0	1-9		10-40	sec	

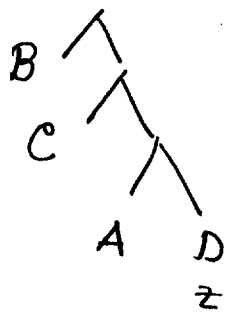
1254. a

According to my reconstruction of 1254, the indicated pedigree is



But, e.g., in #1, E chosen is listed as 2.

as if



Can this be right?
I think I must be correct now!

---

partition of E

for n_4 minimal

E	#	E+P.
1	~~1~~ +1	4
2	~~3~~ +1	2
3	~~3~~	1
4=Z	~~0~~ +1	1

# coer.	
3+1	= 4
2+1	3
1	1
0	0

+ 

= (3-4)

and one clone c/ Z disappeared.

contemporary summary is either wrong or my interpretation of the ~~result~~ argument!

→

See Summary

IGNORE

1253-4

Tetrahymena

Z and Fla+ changes.

6/8/56

pub. in W 1177, W 2802

superseded by later tests in methocel.

1254.

1 Released Tz dissolves in oil
2 Z taken up only by stationary cultures.

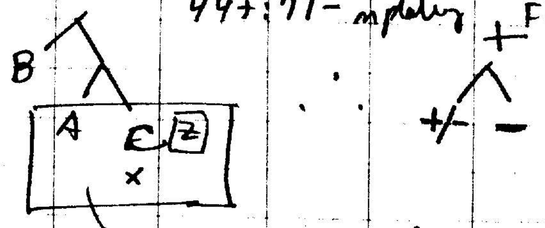
(a) 93 → x 666 A) prestained cells B) poststained cells.

Almost no motile A were stained; only 20% of motile B were stained: not random sample; 50% of parent population was! Z changes followed 4-6 fissions

28 isolates B, 2 from A.

1 swarm = 31 B. What is pedigree? ↙ [Need to reconstruct the tabulations.]

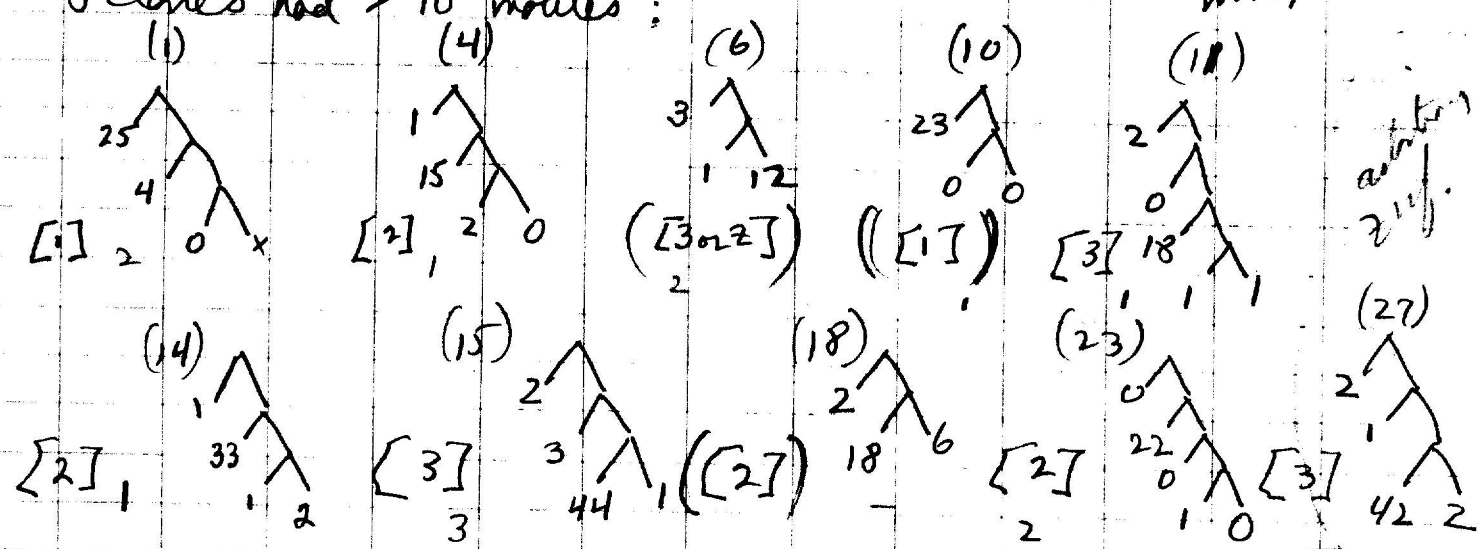
44+ : 77- on plating



Halts. 3 were motile at isol; none later.

8 clones had > 10 motiles:

See correction next page

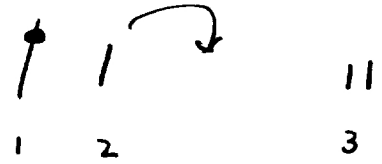


No persistent polarity of motion though ⟶ is less stable and probably less frequent.

6/9/66.

The problem is how to read probots.

E.G.



Does $\overset{1}{\underset{2}{!}}\rightarrow$ mean this cell is interpolated betwn 1 and 3 or put to right of 3. As practical matter, almost certainly the latter. Then sequence becomes:

A	B	C	D	E
4	1	2	3	2

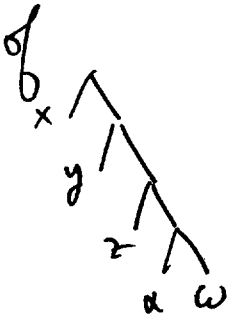
rather than

A	B	C	D	E
4	3	2	1	2

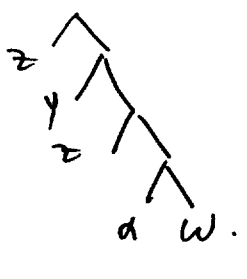
To translate prolynics as given, invert the central items.

A and E still have to be the the terminal sides.

i.e., instead of



read



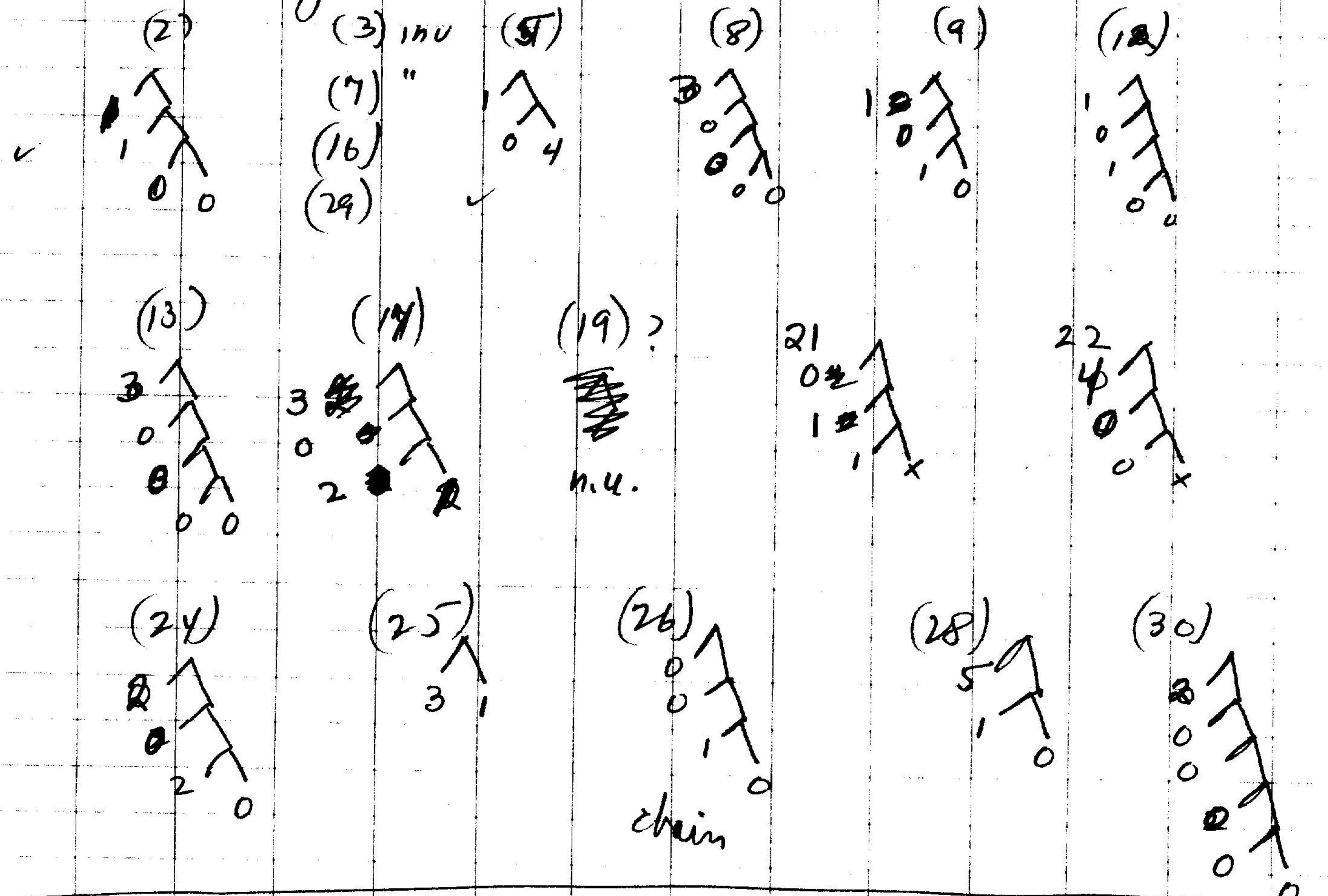
This now agrees w/ prolynics summary.

SEE ~~SUMMARY~~ ~~IGNORE~~ elsewhere for partition of chains

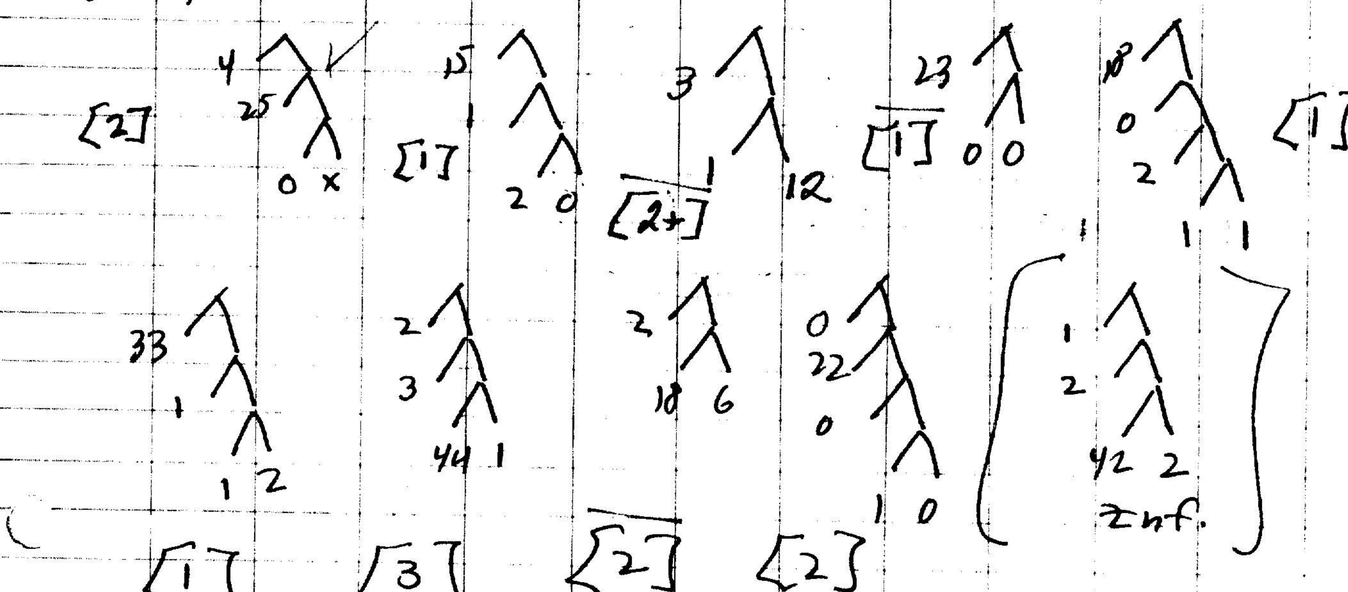
~~[scribbled out]~~ —

corrected.

Remaining classes are non-E.

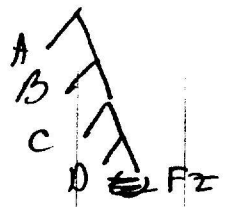


Omitted E classes:



SUMMARY

1254
tabulate.



E clones.

	A	B	C	D	W	Σ	
✓	4	25	0		x	29	
✓	15	1	2		0	18	
= (	3	1	.....		12	16	) ≡
✓	23	0			0	23	)
✓	18	0	2	1	1	22	
✓	13	1	1		2	17	
	2	3	(44)		1	50	
(	2	18			6	26	)
	0	22	0	1	0	23	
Z inf. → (	1	2	42		2	47	)
Distributions #	4	3	1+1	[1]			
swarm	0	⊞	+		x		
nest	1	1	0		0		
	1	0			4		
	3	0	0	0	0		
	1	0	1		0		
	1	0	1	0	0		
	3	0	0	0	0		
	3	0	2		1		
	0	1	1		x		
	4	0	0		x		
	2	0	2		0		
	3				1		
	0	0	1		0		
	5	1			0		
	2	0	0	0/0	0		

Forward 4:3:1:0
Random Exp: 4:2:1:1
Poker Exp 4:0:0:4

Neg. correlation of Z and E not excluded. But

1	
5	see 1259

see 1259 B2 for more

Initials with Fz granule. Follow the Z chain to W.

10 E clones
1 swarm
14 E.
4 inviable

T2; Methocel.

1255
7
8

DATE: 6/7/56. REF:

	1	2	3	4	5	6	7	8	9	10

W1177 Used 2% methocel 4000 to form necklaces i usually terminal 2. See sketches. This particular series too slowly.

W1177 much same. 1257

10 ditto tried glow beads as positional markers but this n.g. 1258
Note interstitial lysis of necklaces after refrigeration.
some 2 ~~lysis~~ chains i terminal 2 still intact.

~~Suggest~~ +10 cps methocel to slow up Fla+
Noted that swarm cells are much more active than initials. Residual motiles are 6 sw 7E 4 # 4 ng. suggesting selection in favor of #. These were ↓ at 10^{3}-10^{4} dilutions of ⊕
9, 2, 12, 1, 12, 4, 18, 24, 2, 15, 16.
Also attempted to isolate E from interim clones in methocel, unsuccessful.
2% MeC 400 stops 80-90% of Fla+. No selections are E
1% ~~stops~~ none; move more slowly

~~A Sketch~~

A. No Z. 1% methocel 400 (probably too thin) (15% selected)
13 clones 2?E in cursory studies. most active 10,11,12,14.

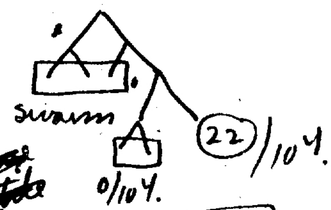
B. Z. Partial separation of early fissions.

(−C) 38 initials 3ng. 4 E 5 sw.

some partition data

E: (E) 15, 10, 11, 6 See for partition info.

SW: B2 interesting



~~[illegible]~~ ~~[illegible]~~ ~~failed to [illegible]~~ ~~[illegible]~~ ty.

238 died before picking.

C8 |||| 0/104. | sw

3 others uninformative on segregation.

D see 1250 serum effect.

E. Like B but no separation. 34 isolates
4E 9 11 15 16
25 ∅ $0^3\ 1^5\ 2^1\ 3^4\ 4^2\ 5^2\ 6^1\ 7^1$
sw 5 not plated.
inv 5

conclude no selectivity for E cells in 1% methocel.

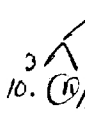
(12598-C)

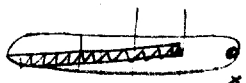
4E 4 swr /34/ isolates.

b 1 ≠ 111 { ↓ 37/ i 10⁴. (15)/10⁴. 10³.

b 2 swarm swarm

b 10 no repln. → (10)/10⁴.

c 1  10⁴. E 

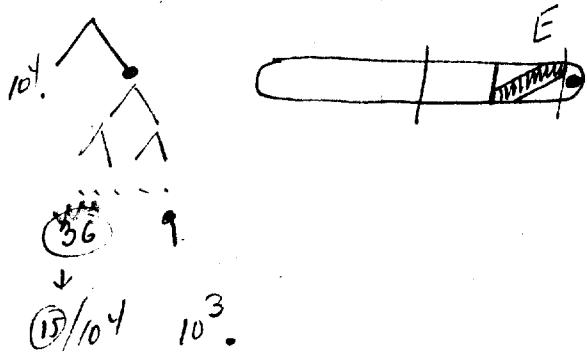
c 2 111 (6) ↓ 9 10⁴. x  E6

c 4 not sep. → swr? > (10)/10⁴. before picking not plated

c 5 x swr x. ∴ → swarm not plated pure.

c 8 111.1 / ↓ < swr swr

Fla⁻ 0/10⁴. Swarm.

presume b1 

MeC 400 1½%   1260

6/10/13   6 partitions.

DATE: REF:

treated slide   10% selected by MeC   No initial as active as SSD Fla+

Some partitions at n,

3rd ~~24~~ 20 lobes   splits

A. (4) : 2 inv   14:1   6:5
15   11

B. (1)/x   (1)   (2)/4/1/x   (14)   (1) (1)   (3)   0/0/0
1   1   7   14   2   3   0

4 inv   (1)/(1)   2/1   0/(1)/0   0/4/1   1/3   3   0   0
2   3   1   5   4   3

1 sw.   0   0   2/1   1/0   (5)   sw ++++   0/0
3   1   5

20 ¢
1 E

and   ~~6/~~   1/20   8/20   2/2   4/12   3/2   7/26.
21   28   4   16   5   33

4 E
2 ¢

∴ Totals.

E	~~6~~ 7
¢	2~~3~~
sw	1
x	6
	~~34~~ 37.

no marked selection for E

distributions

0	6
1	4
2	2
3	4
4	2
5	3
~~7~~	1
~~11~~	1
~~14~~	1

~~15~~ ~~16~~ ~~1~~ ~~12~~

leads: 7, 11, 14, 15, 16, 21, 28, 33

inv ~~4~~ 6

Method 1261

DATE: REF:

2% MeC 400. discrimination factor about 1% 6/150.

A. (Takes too long to establish differential) + wetting problem

Clones 5 partitions:

⊕ /10^3-10^4:

25, 20, 3, 16, 1, 6, 2, 50; 3, 20, 18, 3, 20, 7, 11, 13, 10, scr

and 2 inviable.

10E 7/

Remarks - better to wait until linkage organization is better understood or for similar studies crossing systems.

Flat also greatly slowed but must not matter.

44+ / 265 -

MeCl 400 2%

predigested tuples.

1262

No cont. motile cells (like Plat) seen.

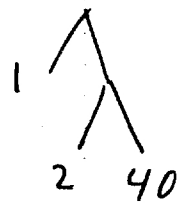
34 initials; only 3 E's and 1 swarm (pure at n_2 n_3)

deets. n.g 10

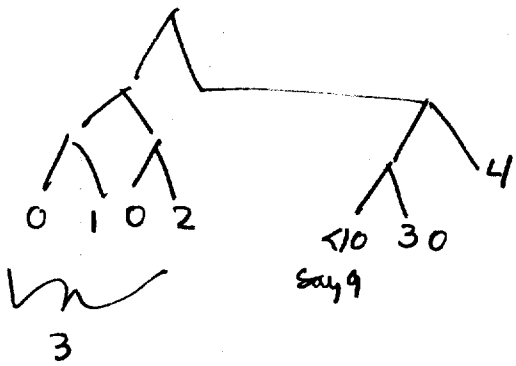
22F { 0 11, 1 5, 2 2, 3 1, 4 1, 6 1, 7 1 }

28
37
43.

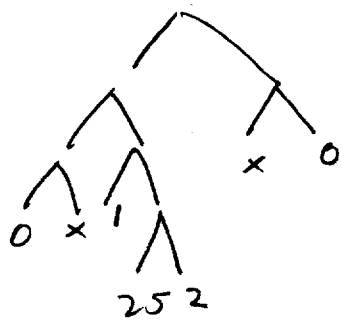
Partitions.



42:1
40:2



40: 3
39: 4
30: 9



28:0
28:0
27:1
25:2

no selection by MeC.

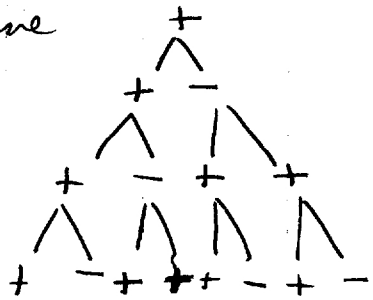
Leifson cultures. 1272

6/10/56.

H1. Ps. aeruginosa typically —oo probably closest.

H32 vibrio —o and ~o

did have

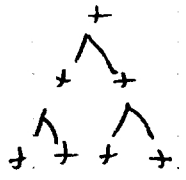


see 242 before writing.

but same + + also.

— later → +.

Salmonella typically is from many observations

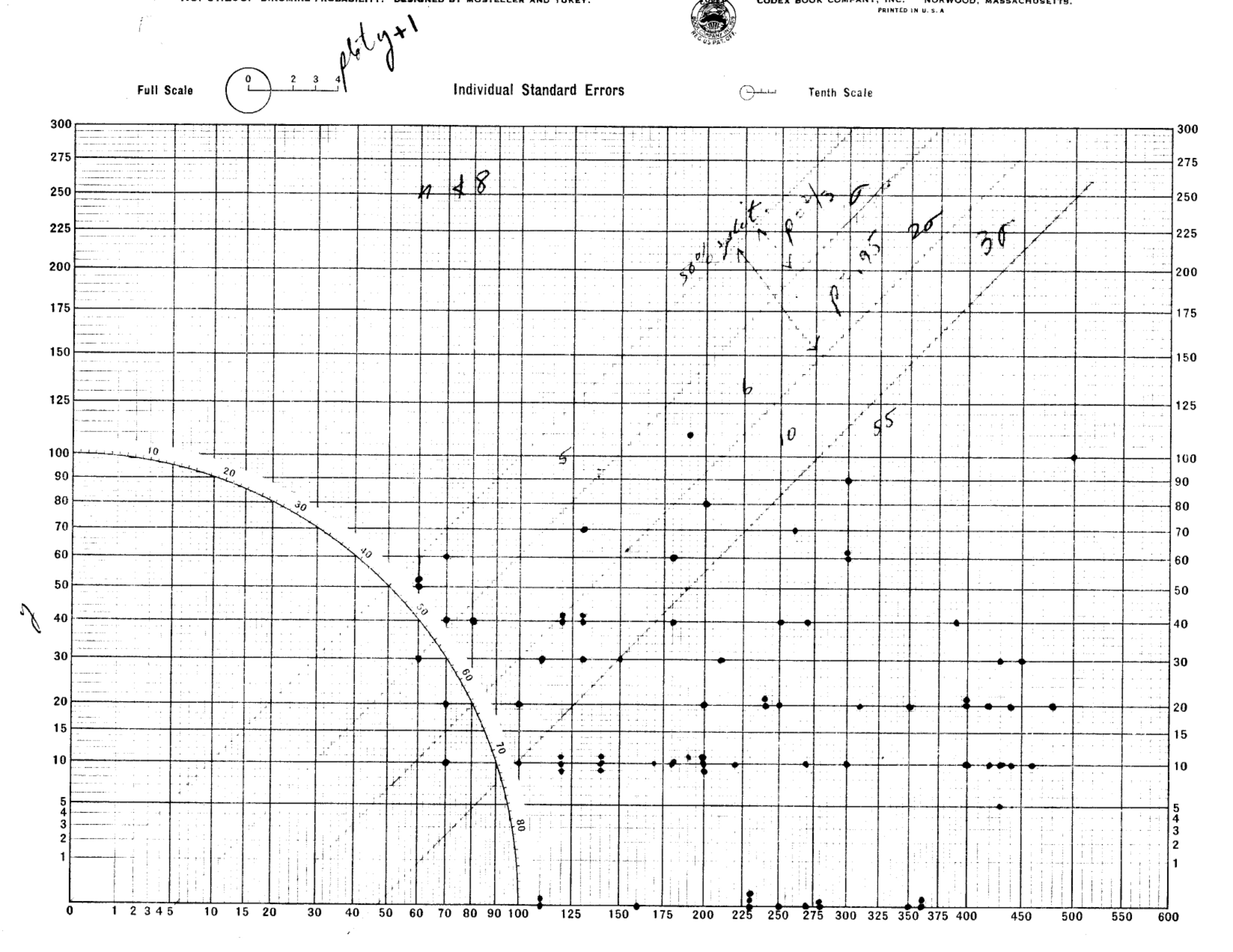


Summary of splits

Exclude vague splits

DATE: REF:

	1	2	3	4	5	6	7	8	9	10
1134 A1	1 10			1212 C1	6 7		1259:	0 36		
A5	~~10~~ 7 50			B3	6 3			0 36		
				D1	4 7					
				F1	1 7			0 11		
1138 B4	1 17			C5	2 24			0 11		
	4 13				3 21					
					1 20					
1141 A4	2 31						1260	1 14		
	1 30							5 6		
10	11 19	- possible ambiguity but 1 Hemitone.								
	1 18							1 20		
[B4	1 14	but sep 1 call from 7]						8 20		
1143 E2	2 7							4 12		
								7 26		
1144 B4	~~0~~ 21	Incl (15) from intermediate Isl.					1262	1 42		
20								2 40		
A1	0 16									
				1244	1 14			3 43		
					2 3 11			4 39		
								9 30		
					6 5					
1147 F2	1 12							0 28		
				1254	4 25			0 28		
1149 B5	4 12				0 25			1 27		
	2 10							2 25		
30					3 15					
D3	1 12				3 13					
					1 12					
D5	2 35									
	0 30				23 0					
E4	1 40									
					4 18					
F4	2 40									
					4 13					
F2	2 20									
					2 48					
1150 F2	6 30				3 45					
E3	4 8				1 44					
E4	4 13									
A1	1 43				2 24					
C3	6 30				6 18					
E5	1 20									
F1	4 27				0 23					
					1 22					
50					~~2 2~~					
					1 46					
					2 44					
					2 42					
				1259	0 22					



Review summaries.

DATE: REF: of. other areas

	1	2	3	4	5	6	7	8	9	10

1. Lines. tabulate only long (10 or more gens?) and late ones.
   Give statistics on these.

2. Partitions. Use scatter diagrams? (Relate succ. fractions to one clone?)
   on prob. paper! for $\Sigma = 48$ ✓

3. Swarm-containing clones: segregations. ✓

4. distribution of lines per clone. ✓

5. Serum effects.

How many isolations; pedigrees?