5/27/56.

1212 → early partitions

1214 calibrate loop volume. + trails in motag. no trails, only clusters.
ratio of trails to swarms FA37-xSW666

		Exp 5	6		
Σ spots (diluted)	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 earlier data). See 1216

1215 – First platings of SW666 diluted in motag

1216 SW967x ; plating & dil. agar. noted satellites.
BADS* 16 hour trails with 30–54 colonies per trail
vary motag. Not reliable. Looked for evidence on non random distr trails per spot

2/5/55 1217 → ~~early partitions, plate~~; Clones from undivided initials; plate
1218 Inconseq
1219

5/27/56.

1212 → early partitions

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ratio of trails to swarms FA37-xSW666

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	S	2	10	
	T	2	6	
	T+S	1	3	
		32	30.	
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2/5/55 1217 → ~~early partitions, plate~~ Clones from undivided initials ; plate
1218 Dconseq
1219

5/27/56.

1219 – 1221 – 1222

1219 SW967x–50B. ① effect of extra cells ② trails per initial.

added	initials	Crew	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 fished drops. 34 viable → 4 trails motag.

~~[illegible]~~

~~Crew in: explant res. drop~~

+ −
− +
+ +
− −

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. cf $\frac{1}{48}$, 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 0T/14 cols. Hegly!

effect of spreading considered (spots before now).

1225 ditto. and controls on residues.

a) 96 initials → 14 clones (low viability!) 2* plus catenate

b) 14 " strobed out cupipette → 1 trail

c) 2 complete clones (*?) spread out → small clusters under lawn.

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 diffs in stages.

967x

altogether 38T, 138 colonies = 1/4.

& poor plates, 10/171 No diffs.

also misc effects. possible φOH → 17/40.

1 trail: 125 colonies in 17 hours

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

1227 40 initials to broth for plating in tubes + plates.

12/17 good clones No major trails; all slow "minor".

+8 500–1000 some photographed

→ 1 trail

pooled: 19 → 14/four trails 1/20/25 = 1 trail/20 viable clones/25 initials

---

1228–9– plated clones as 1237 summary. 1229: described that SW967 produced spontaneous minors. Other Fla did not.

–30. – spontaneous motiles.

5/28/56.

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

1231 all major trails occurred singly.

1232 Scopped 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

1227 } SW967 x— Clones: in 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 difference)

(problem of quiescence at large cell size)

SW666 x—
1232 4/16/25 Majors single, but other clusters 2^6
1233 1/34/47 2^6
1234 6/15/48 Concurrence of trails! 2^{3-4}

"selected" clones (most active in mucioscopic following).

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

48 clones followed: ~~3~~ 4 ~~2~~ swarms + single (all 4)
and flare effect.

3 sibs tested, all b Fla− note ratios.

In selected group 2/7/7 (grown before picking)
control 0/10 incl 1 swarm
2/17/17

} expt to test "quiescent vs active" clones

Would S/T concurrence be obvious?

5/28/56.

1227 – 1237

pooled – initials: platings in motog.

SW967x — 1228 ~~11/10~~ 11/81/100

practically no swarms 1229 24/198/200

35/279/300

SW666x —

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

old prepn.

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

1237 of 15 swarms, 8 were clear, 5 had single at center, 1 had c^2, 1 had ○∘∘ ; ∘ at near-center. no recorded attempt to isolate (see A)

5/28/56. 1238

FA37-xSW666

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

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

Effect of agar on T.S... ~50 samples:

NB/25 ml motag. Input ~50

	Clear	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 blanks 4 contam. } all but C1 singles only. } 9, 9, 2, 31 = (4)
D 8 blanks 5 clones } 6 to 52 (18)
see protocol notes for clone sizes ↑

22 viable clones

1239
5/28/06.

plate clones in 60% MGA.

incubation not limited for these

a) MGA
1 contam 12 blank 16 all singles 2 swarms, no def. 1-colonies; 2 large plaques.

b) MGA60
8 blank 1 swarm + 41-cols.
6 all singles
1 11 trails (100; 30 elements). See photo 1239-6

see notes protocol for clone sizes: ~~from 6~~ - from 11 to 225.

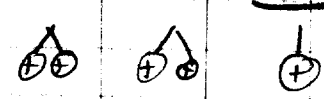
1240 used Wilson gelatin n.g. but have photos.
plated clones. 9 blank 19 visible

also mass platings
3 sw 1 e T
3 sw 1 T
1 e1

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

40 ① to 10⁴. "No E" - too many cells.

1241 part prolegnis: saved 3 Fla+ clones.
49.



1242

6/7/56 1242

(A:) Single cell clones plated in MGA+40% NSB
18 empty
7 swarms, all had additionally: 50 1's; 4 1'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: 6 1's 8 clusters 3-6 1 T^{35} 1 T^{10} ←
#37: 18-1 3-C 1 T
#27: 6-1 9-C 1 T

MGA+40 #11: 37-1 5-C 21 T (>10/t; 2 had 100, 150 see photo) phot ←
10: >100-1
4: 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 slopped; 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 beath.
growth limited to 100-1000. 18 examined

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

4 sol. { 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
C6 1 (18)/1000
} plated ⊕ as is.

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	I	SW	Σ
MGA	88	12	9	5	114
MGA + 40% penassay	129	0	8	12	149.

but MGA itself seemed soft.

Single clones
12 blanks; See protocols

1244

6/7/56.

1244

Plate sib clones.

- 15 pairs; 24's

Trail distribution: (clusters as subsa.) x = no clone

3 - 11 - 1 - 0_2

1 - 0_1 - 0_x - 2

0 - 0_3

2 - 4

1 - 2

11 - x

0 - 0

0 - 1

x - 0

1 - 1

6 - 5

x - 1

x - 8

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

$\boxed{\text{some photos}}$ Note that agar too 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 (+) p. clard urine completely inhibited by anti b or anti i.
overnight, clones in i, b serum: 1 weighing cell isol but n.g.

C) ~~35~~ 43 clones plated. MGA 60. 35 viable incl 1 swarm (pure)
readings: ? see photos

6/8/56 [1246]

Serum inh of trails [b, i.]

SW666x — FA11; x — FA32 initials isol 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 — x 666

a	+
b	−
c	+
d	+
i	−
k	+
r	+
1,2	+
B-O	±

∴ 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 inhib 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⁻.

6/8/56.

1250
1252
1256
1258E

a → x SW666; 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+'s b effect.

b (minnesota) serum to check specificity; plating 1252

10 → x 666 results as above.

see phot.

no further test of specificity availability.

~~No expts c a on microclones?~~ 1256

from 1252.

Tested residual ? trails in b serum. This would be one way of picking up Fla+ ex // Fla1− H1a. These were probably areas of nondiffusion of b serum. proved H1b.

Many + + + − seen.

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

1259D 300 (+) each tested in a, b serum. a inhibited more slowly than b but initials all inhibited except c 2% which persisted at all.
4 cells persisted in b, 3 viable wire swarms.
2 a 0 viable.

of later interm isolates, e.g. Bb15 (4)/a serum → 2 remained motile. most others immobilized. Conclude some terminals not affected by a. while all initials are.

Correlation of initial motility & progeny, segregation in swarms

56 ① isol for microclones Examine for ⊕; underestimates

NG 13 swarms 4+1 0/2^{13} 6 <9/2^{13} 22 >10/2^{13} 11

high incidence! of E

5 clones harvested for replating of intermediates ⊕.

B3
B12
C9
C1

} 1's and v.s. trails only

D1 swarms. Replate residue: 8 sw/92 colonies. ∴ only ~10% + sic.
no trails from initial isol.

Note: this clone scored as (40)/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 centered.

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 most active	2	1	2	6	0	2	1	1	

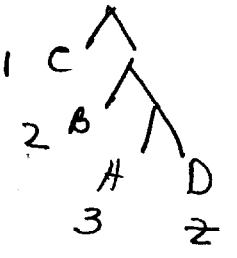
No obvious correlation between progeny + initial motility. cf. method.

inv	0				
13	6	22	11	5	57
2	1	8	3	1	15
—	0	1–9	10–40	sw	

broader classes.

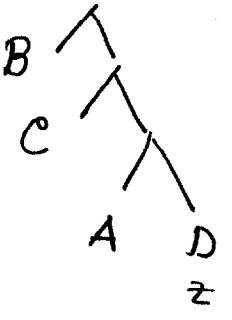
1254. a

According to my reconstruction of 1254, the indicated pelegrie is



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

as if



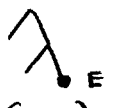
Can this be right?
I think I must be correct now!

---

partition of E

for n_4 minimal

E	~~#~~	E x p.	# corr.	
1	~~1+1~~	4	3+1	= 4
2	~~3+1~~	2	2+1	3
3	~~3+1~~	1	1	1
4=Z	~~0~~	1	0	0

+ 

= (3−4)

contemporary summary is either wrong or my interpretation of the ~~results~~ sequence!

and one clone c/ Z disappeared.

See Summary

1253-4

IGNORE

Tetrazolium

Z and Fla+ chains.

6/8/56

prel. on W 1177, W 2802
superseded by later tests in method.

1254.

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

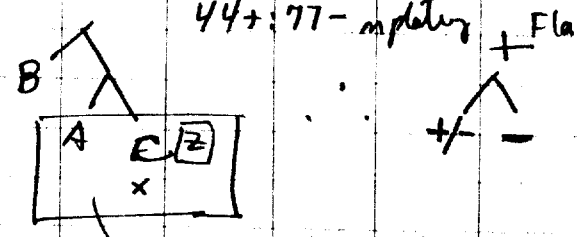
(a) 93 → x 666 A prestained cells B) post stained cells.

Almost no motile A were stained; only 2% of motile B were stained. not random sample; 50% of parent population was! Z chains followed 4-6 fissions

28 isolates B, 2 from A.

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

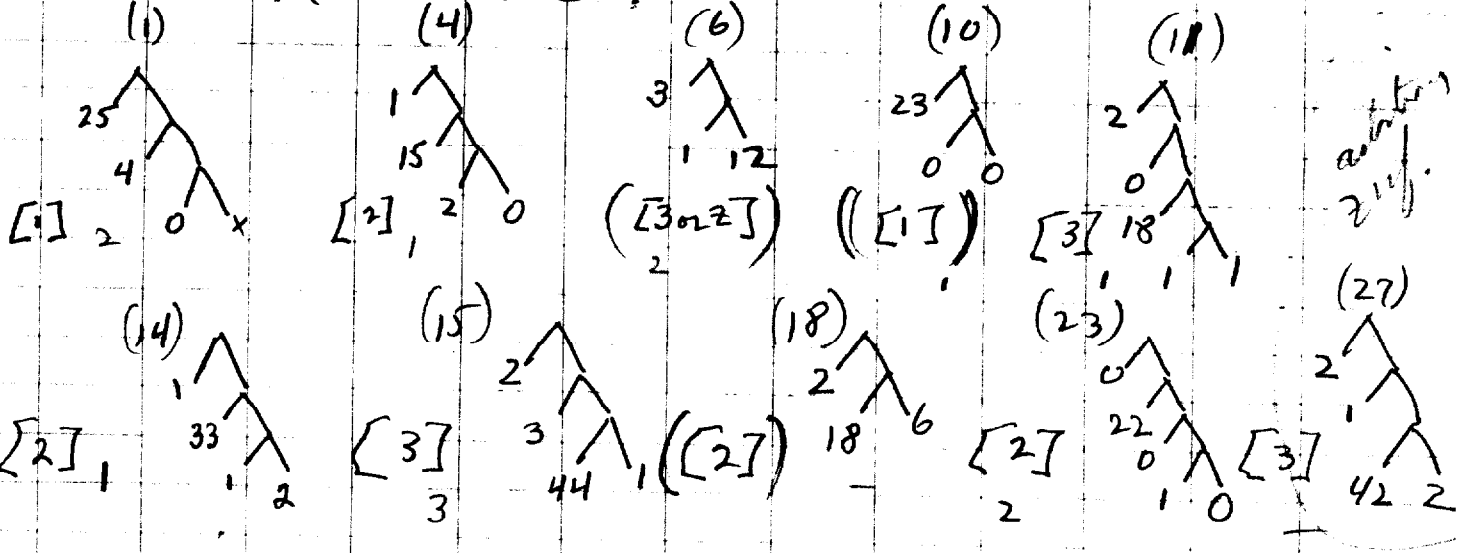
44+ : 77 - on plating



11 cells. 3 were motile at isol; none later.

8 clones had > 10 motiles:

See correction next page

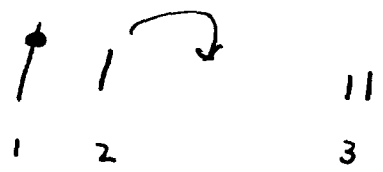


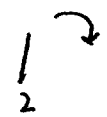
No persistent polarity of motion though ⟲ is ~~more~~ less stable and probably ~~more~~ less frequent.

6/9/06.

The problem is how to read protocols.

E.G.



Does  mean this cell is interpolated between 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	Z

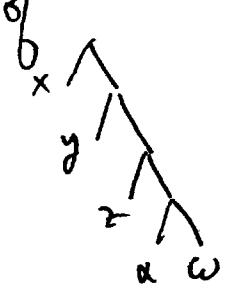
rather than

A	B	C	D	E
4	3	2	1	Z

To translate pedigrees as given over, invert the central items.

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

i.e., instead of



read

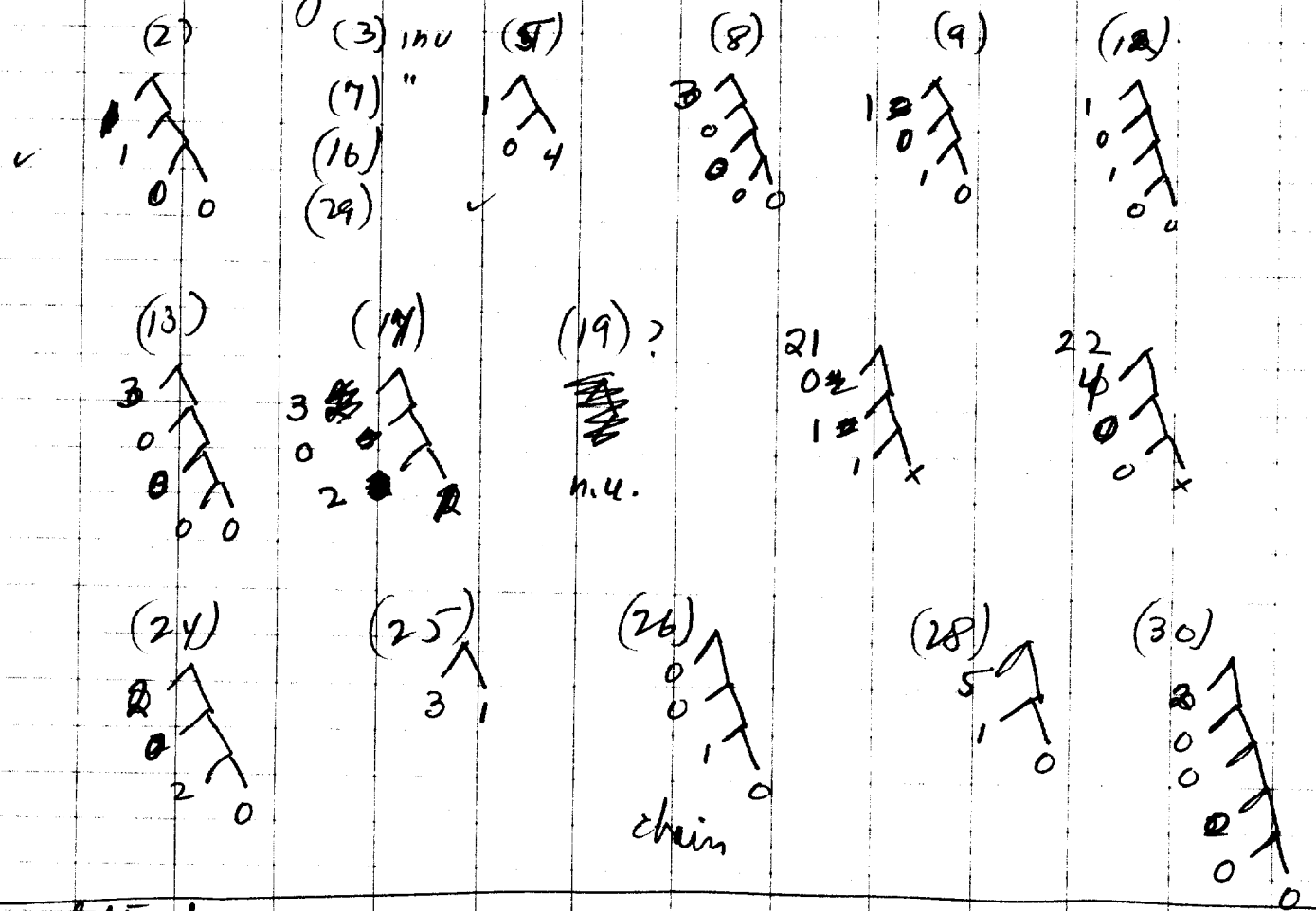
This how agrees w/ previous summary.

~~[illegible]~~ — SEE ~~SUMMARY~~ also use ~~IGNORE~~ partition of chains

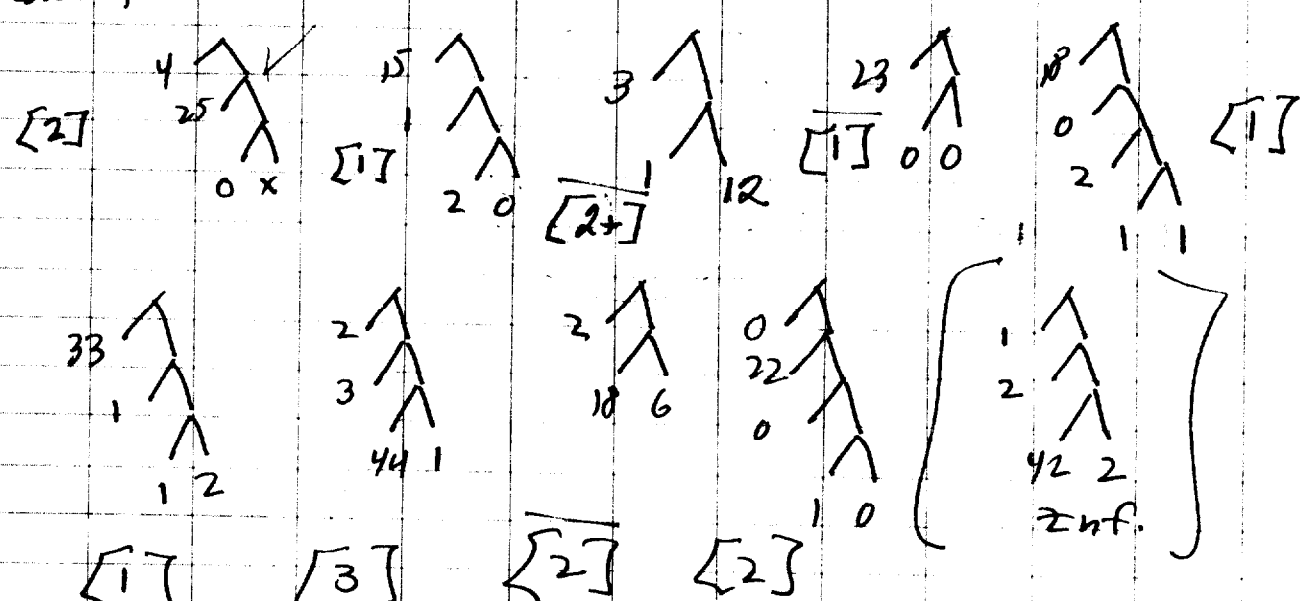
1254

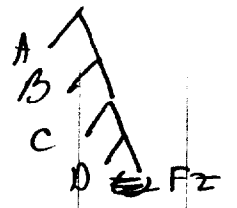
corrected.

Remaining classes are non-E.



Corrected 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	
2 inf. → (	1	2	42		2	47	)
Distributions #	4	3	1+1	[1]		Found 4:3:1:0	
						Random Exp: 4:2:1:1	
						Poker Exp 4:0:0:4	
swarm	0	⊞	+		x		
			-				
nonE	1	1	0		0	Neg. correlation of Z and E not excluded. But 1259	
	1	0			4		
	3	0	0	0	0	3	
1259 B2	1	0	1		0	2	
for mod	1	0	1	0	0	2	
	3	0	0	0	0	3	
	3	0	2		1	6	
	0	1	1		x	2	
	4	0	0		x	4	
	2	0	2		0	4	
	3				1	4	
	0	0	1		0	1	
	5	1			0	6	
	2	0	0	0/0	0	2	

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

10 E clones
1 swarm
14 E
4 inviable

TZ; Methocel.

1255
7
8

DATE: REF:

6/9/56.

W1177 Used 2% methocel 4000 to form necklaces c̄ usually terminal Z. See sketches. This particular series too slosky.

W1177 much same. 1257

ditto tried glow beads as positional markers but this n.v.g. 1258
Note interstitial lysis of necklaces after refrigeration.
some Z ~~[illegible]~~ chains c̄ terminal Z still intact.

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

~~a serum~~

methocel, Z. 1259.

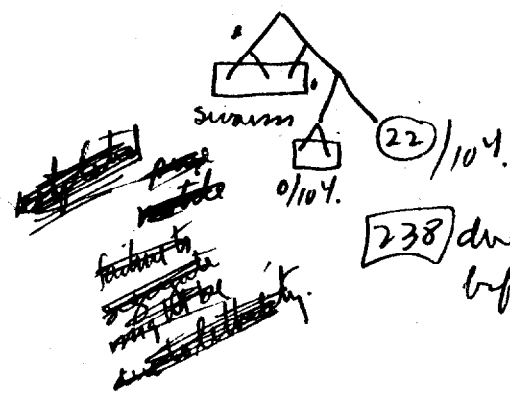
A. No Z. 1% methocel 400 (probably too thin) (15% selected)
13 clones 2?E on cursory study. most active 10, 11, 12, 14.

B. Z. Partial separation of early fissions.

(-C) 38 initials 3ng. 4 E 5 sw.

some partition data E: ⊕ 15, 10, 11, 6 See for partition info.

SW: B2 interesting



238 dried before picking.

C8 1111 0/10⁴. sw

3 others uninformative on segregation.

D see 1250 swarm 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.

(1259 B-C)

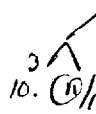
4E 4 sw / 34 isolates.

b 1 111 { ↑ → 37 / ↑ 10^4. 15/10^4. 10^3.

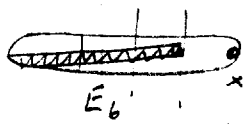
b 2 swarm sewer

b 10 no sepn. ↑ → 10/10^4.

c 1 3 10. 11/10^4. 10^4. E



c 2 111 6 ↑ 9 10^4. × E_6 ×



c 4 ↑ not sep. → sw? > 10/10^4. ~~before~~ pickering not plated

c 5 × sw ×. ∴ ↑ → swarm ~~not plated~~ pure.

c 8 111.1 / ↑ < sw / sw

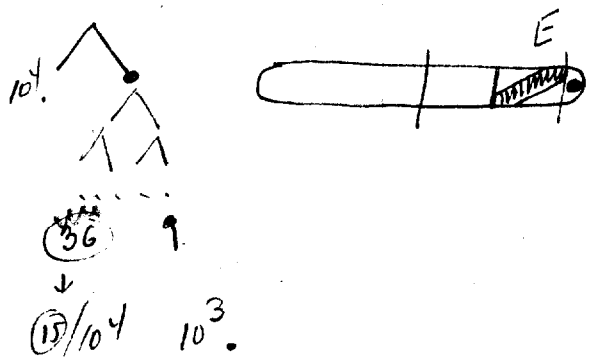
Fla⁻ 0/10^4. swarm.

preserve b1 10^4. E

36 ↑

↓

15/10^4 10^3.



MeC 400 1½% 1260

6/10/18 + partitions.

DATE: REF:

1	2	3	4	5	6	7	8	9	10

Greased slide 10% selected by MeC No initial as active as S4D Flat

Some partitions at n,

3 of ~~[illegible]~~ isolates 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

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

1 sw. 20 ~~E~~ 1 ~~E~~ 0 0 2/1 1/0 (5) sw ++++ 0/0

and ~~[illegible]~~ 1/20 8/20 2/2 4/12 3/2 7/26.

4 E 2 ~~E~~

∴ Totals.

E	~~[illegible]~~ 7
~~E~~	23
sw	1
x	6
	~~[illegible]~~ 37.

no marked selection for E

distributions

0	6
1	4
2	2
3	4
4	2
5	3
~~[illegible]~~	1
~~11~~	1
~~14~~	1
inv	~~[illegible]~~ 6

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

1 each: 7, 11, 14, 15, 16, 21, 28, 33

Method

1261

DATE: REF:

	1	2	3	4	5	6	7	8	9	10

2% MeC 400. discrimination factor about 1% cf 1258.

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

Clones & partition:

⊕/10^3–10^4:

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

and 2 inviable.

10 E 7 ~~E~~

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

Flat also greatly slowed but most not inactive.

44+ / 265 –

30

40

50

MeCl 400 2%

1262

pedigree attempts.

No cont. motile cells (like Fla+) seen.

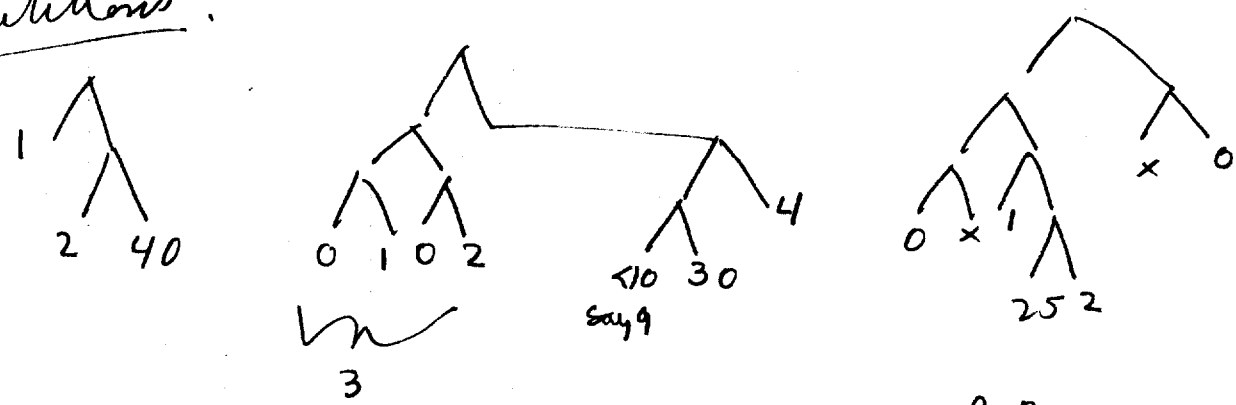
34 initials; only 3 E's and 1 swarm (pure at n_2 n_3)

distr.

n.g	10	
0	11	
1	5	
2	2	
3	1	
4	1	28
6	1	37
7	1	43.

22 E

Partitions.



42:1
40:2

40: 3
39: 4
30: 9

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

no selection by MeC.

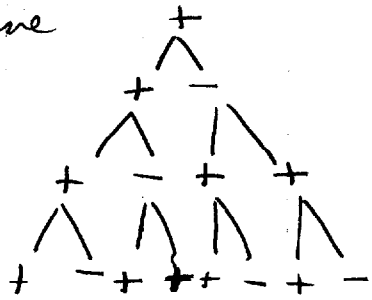
Leifson cultures. 1272

6/10/56.

H1. Ps. aeruginosa typically —OO probably charest.

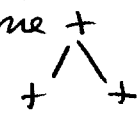
H32 vibrio =O and =O<

did have



see 242 before writing.

but same

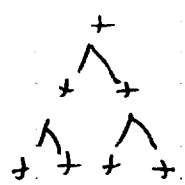


also.

— 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 50			B3	6 3			0 36		
				D1	4 7					
1138 B4	1 17			F1	1 7			0 11		
	4 13			C5	2 24			0 11		
					3 21					
					1 20					
1141 A4	2 31						1260	1 14		
	1 30							5 6		
10	11 19	- possible ambiguity but l. limits 0 15.								
	1 18							1 20		
[B4	1 14	but sep 1 cell from 7]						8 20		
1143 E2	2 7							4 12		
								7 26		
1144 B4	0 27	Incl (15) from intermediate isol.					1262	1 42		
20								2 40		
B1	0 16									
				1244	1 14			3 43		
					3 11			4 39		
								9 30		
1147 F2	1 12				6 5					
								0 28		
1149 B5	4 12			1254	4 25			0 28		
	2 10				0 25			1 27		
30								2 25		
					3 15					
D3	1 12				3 13					
					1 12					
D5	2 35									
	0 35				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	7 13									
A1	1 43				2 24					
F3	6 30				6 18					
E5	1 20									
F1	4 27				0 23					
					1 22					
50										
					1 46					
					2 44					
					2 42					
				1259	0 22					

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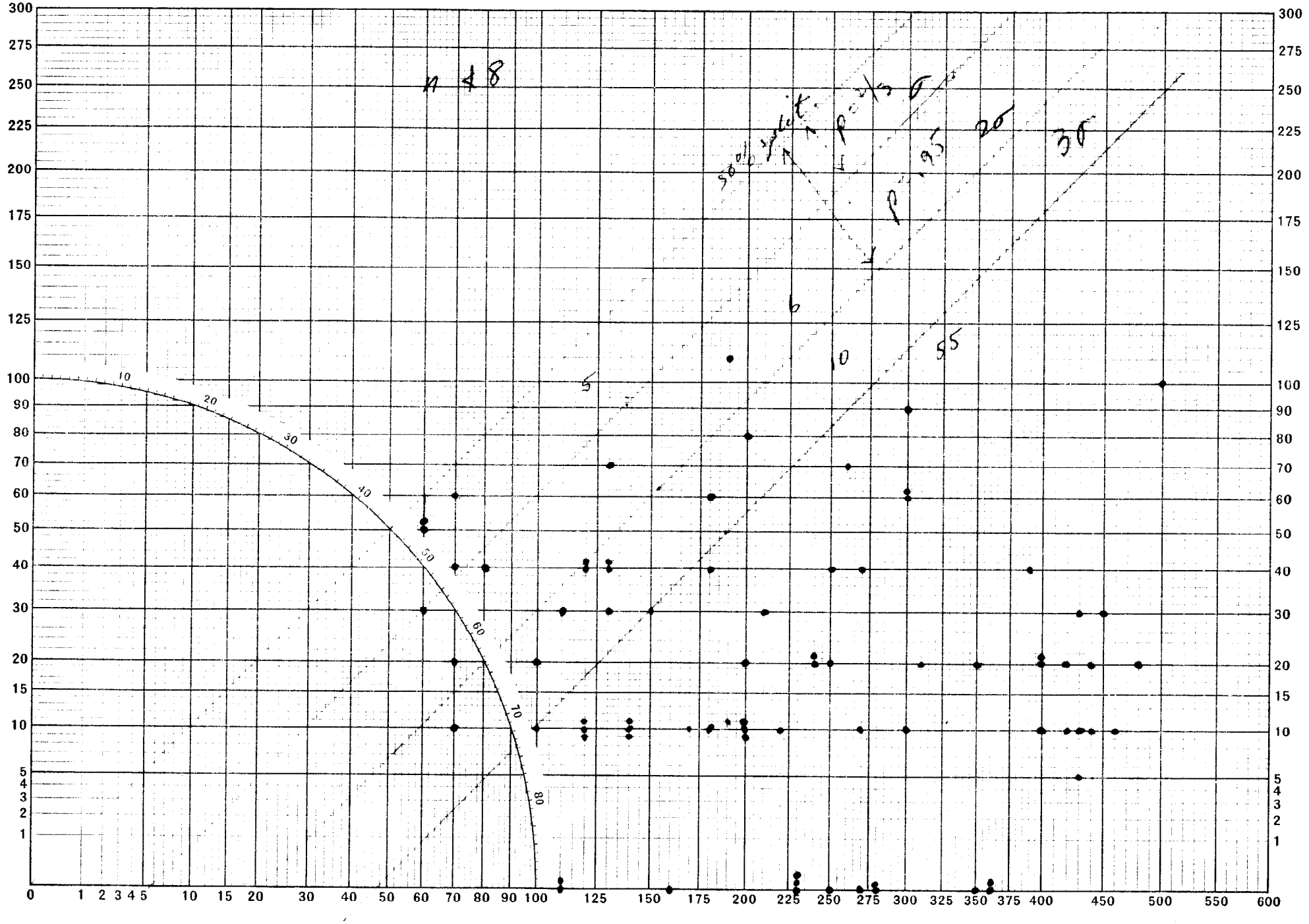
Full Scale 0 2 3 4 plot y+1

Individual Standard Errors

Tenth Scale



Review summaries.

DATE: REF:

	1	2	3	4	5	6	7 cf. orthoclones	8	9	10
1.	Lines.	tabulate only long (10 or more gen?) and late ones. Give statistics on others.								
2.	Partitions.	Use scatter diagrams? on prob. paper!					(Relate succ. fissions in one clone?) for $\Sigma = \pm 8$		✓	
3.	Swarm-containing clones: segregation.								✓	
4.	distribution of lines per clone.								✓	
5	Serum effects.									

How many isolations; pedigrees?