18

1357

17

DATE: 1109-C3. REF:

see notes

6/21. Not yet analysed.

Lac V_1 Ara:

Plated on B Ara: pure Ara$^+$. 4 checked: Lac$^+$ V_1^r.

But weak Lac reaction is suspicious. Plate on B Gal!

Restreaked 18 on B Lac: pure Lac$^+$ but weak and strong weak Lac$^+$ are Gal$^-$! (2-3 ? Lac$^-$ small cols.)

History 10 → motile clumps → (11) ⊕

→ C3

∴ if ♂ is present, not reliable. However, presence of Gal$^-$ recombinant may be valid. So far, 18 seems to carry Ara$^+$ Lac$^+$ Gal$^+$/$-$ V_1^r

contemporary record: MXM$^-$ S^R (Gal$^+$).

Note: so far identified: Gal$^-$ Lac$^+$ Ara$^+$ V_1^r.

Isolates:

a.	Gal$^-$ Lac$^+$ Ara$^+$ V_1^r	Xyl$^+$ S^s	Gal$^-$ S^s V_1^r Lac$^\pm$ Ara$^+$
b	Gal$^+$ Lac$^+$	Xyl$^+$ S^s	Gal$^+$ S^s V_1^r Lac$^+$ Ara$^+$
c.	Lac$^+$?	Xyl$^+$ S^s	Gal$^-$ S^s V_1^r Lac$^\pm$ Ara$^+$
o		Xyl$^+$ S^s ≡	Gal$^+$, $^-$ S^s (− more^s than +) V_1^r Lac^{++} Ara^{++} V_1^r

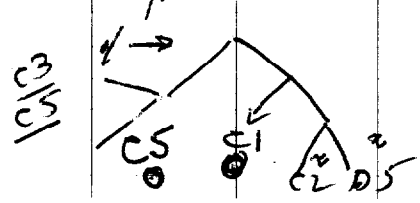
18 is not yet tested on Mal. Is it the ♂?

7/2 On data review, I find that I have used $\boxed{145}$-C3 for these tests. This is the copartner of C1 = #17, both stated and accepted as 100 0000 types

17A = C2

17B = D5

17C = C1



June 24 1957. Incomplete numbers. 1357 B.

DATE: REF:

	1	Found 3	4	Wanted 6	7	8	9	10
6	55H5.	111 011		000 ~~1000~~				
9	56C1	101		100 ~~001~~	mostly Lac⁻		000 ✓ ~~0001~~	
10	C3	101 001 000	✓	~~100 001 Verify Lac⁺ → Lac⁺ +.~~			No 100	
11	D1	100 001 000		Verify				
~~12~~	~~[illegible]~~							
13	G5	111 000 011		100				
18		111 ? ...	GAL!	Verify	Plated: pure Ara⁺.			
19	60A2	010 000		1.. (Original record)	Lac⁺ died out.			
21	61G1	0... 111 0001 111 1111		000 1111 0000001	{(~~000 00~~ 111 0000 is absent)			
23	63C2	Hfr Gal ~~[illegible]~~		Review	1110			
~~24~~ 25	G5	101		100 001 — not present.				
26	B6	011 000		~~010 001~~	Ara⁺ 1-			
27	64B3	101 000		100 001 — none found.				
29	64D3	000/111 · 0000/1111		~~Lgt⁺ S⁺ ? check~~				
30	65A3	000 100 111 (1.0)		Ara⁺ types... 011	300B.			
35		111 000	Lac⁺ S^s	~~[illegible]~~ Lac⁻ S⁺ ? has Lac⁺ S^s.				
36		111 011		000 100	: No Ara⁻. Segr. at n₂-3.			
55		Lac/Mal.		V₁?				
56		101		Verify ; 001 ✗ checkerslide ~~100~~ of 13. V₁^s ~~Plate: pure Lac⁺ [illegible]~~				
~~65~~		011 100		" ; ~~[illegible]~~ ~~[illegible]~~				
66		011 100		" ; ~~[illegible]~~ ~~[illegible]~~				
67		100; ~~Hfr~~		Verify ~~Hfr~~ (B1, B2, B3 in smooth)				
68		001 110 100 000		"				
~~67~~ 71		111 000		" 100...				
72		111 110		" 001...				
74		~~[illegible]~~ 101		" ~~[illegible]~~				
81		011 100		~~[illegible]~~ Verify				
87		101 only		Verify ; ~~[illegible]~~ no V₁^s, no Lac⁻ evident				
88		Fla		Review.				

40

50

DATE: REF:

	1	2	3	4	5	6	7	8	9	10
17		100	000							
18		~~[illegible]~~ 100			? 001 100					
~~18~~ → 17		~~111...Gal~~	~~δ^s~~		~~pure Ara+~~	~~111 0001 0~~		~~111 0001 1~~		δ^s?
23		Hfr-Gal								
35		111 000	$LacS^r$			000 0000		111 0000	111 0001	
88		Fla, MXM, Gal?		Rx too weak.						
65		~~011 100~~	111 000		verify....					
66		~~011 100~~	111 000		"					
67	A	100; ~~male~~	000							
68	A	~~001 110 100 000~~		101 010 000	"					
71	A	111 000	011							
72	B	111 ~~110~~	000							
74		101	100 000		no 001 seen.					
81		011n100								
87		101			Lac^+ very weak, chuck Gal ? also v. wk.					

~~[illegible] 11, 13, 30, [illegible]~~

30

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3

1357
3

DATE: 1155 - 2.

REF:

1	2	3	4	5	6	7	8	9	10

d, Now almost pure $Ara^+ Lac^+ V_1^N$ all V_1^N is Lac^+ ~~Ara~~ Ara^+.
Further analysis not promising.

~~[illegible]~~ No sib

000 111.

(6)

1B57 - 6

DATE: 115JH5 (= A9) REF:

	1	2	3	4	5	6	7	8	9	10
α:	Lac V_1 Ara.	111	and 011.		~~No 000 now seen.~~			rare	000	
?	Looks for 100, 000. ↓ Replate on B Ara.		Are there any sites?		Yes		GY = A8 could not be found.		Find?	
6/25.	~ 1% Ara⁻		Spot on B Lac		6 are $A^- L^- V_1^S$ = 000					
	~ 600 Ara⁺.				3 contain $L^- V_1^R$, probably {000, 011} but rehuck on Ara. The plate was crowded and many Ara⁻ picks were certainly mixed. Spot V_1° and V_1^R components on Ara.					
	111				V_1^R is Ara⁻. V_1° is Ara⁺/⁻.					
	011				.00 & .11 as indicated. As these are all Lac⁻, no 100 indicated					
	000									
No	100									

7 MXM. 1357 7

DATE: REF:

1156B2.	2	3	4	5	6	7	8	9	10
	Lac Aca U_1	Xyl Mtl Mal S Cal							
Previously found 000...			and	111 1000 0		only			
5/57 α and current tests consistent (17 Lac⁻ are 000..)									

8

1307
8
9

DATE: REF:

1156 B5.

Previously identified 4 types:

	Lac	Ara	V_1^o	Xyl	Mal	S^o	Cal.
1	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0
3	1	0	0	1	0	1	0
4	0	0	0	1	0	1	0
5	0	1	0	0	0	0	0

However, record showed Ara+ also present. V_1^s. This now verified and isolated as #5.

6/20. Mostly Lac+ Ara−. Very few Xyl+ (this also Mal+).
Altogether 73 Ara+ tested: all Lac− Mal− Xyl−. As whole culture is V_1^s, S^r this defines type 5. Stab example!

9. Lac− pool: all V_1^s ∴ 101 000 no 001 / no 100

not tested: Lac+ V_1^s.

on cross brush, 9 has mostly Lac− V_1^s; rare Lac+ V_1^r, ~~[illegible]~~ ~~to plate these~~ no appreciable diminution in T1 portion. Record as no 100.

(10)

1357
10

1156 & 3

DATE: REF:

	1	2	3	4	5	6	7	8	9	10
	Lac VI.									
	Poststalement		101	001	000	muds to be verified ✓				
						any 100?		No		
	Replicate ~200 cols (+,-) to Lac T1, [redacted]									
10	1.1	0.0	0.1	evident	No	1.0				
>100 colonies										
20										
30										
40										
50										

(11)

1357
11

DATE: 1156 D1 REF:

1	2	3	4	5	6	7	8	9	10

Lac V1

100 001 000.

Verify. See 10

plate: all Lac⁻. → pool, contains 000 001

In original cross brush, recorded as mainly −R, +S. rare presumably no +S.

∴ present 000 001 100 absent 101.

✓ but repeat cross-brush. : mostly 001 but remarkable

~~[illegible]~~

13

1357
13 ✓

DATE: ~~HEB~~ 65 REF:

1	2	3	4	5	6	7	8	9	10

111 000 011 identified. about = ~~prop~~ Lac+, − Ara+ −

looks for 100. ~~[illegible]~~ tested already: 27 Ara− are Lac− V_1^s.

an apparent 001 proved to be Fal± Glu± = 13A. probably a mutant. cf 56

α_{10} Lac + − V_1^r +S Plate: Mostly Lac+. Looks for Lac+ Ara−

Ara + r −S see: Lac− Ara+ Lac− Ara− Lac+ Ara+ > 100 tests. 1? Lac+ Ara−. No. Scotch

✓ Lac+. Verify Ara. Ara+ V_1^r

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DATE: 1159-03 REF: 100 ✓ 000

/146/ = A 2/145/ = 3 a 4 5 6 7 8 9 10

This was quite a scramble, as #18 q.v. was taken as 1159-c3 by mistake, (failure to distinguish the two series) and found to be 111 .1.1 1 and 0.

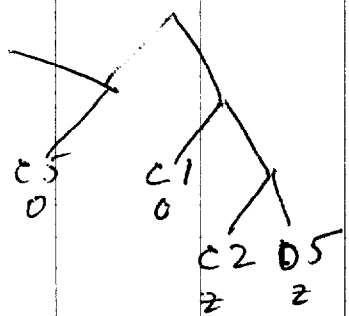
This culture (17-03) was found to be pure Lac+, Ara+, V_i^r, motile, but mixed on Gal.

7/2/57 Does the Gal mixture have any significamce or is it a reversion? The contemporary record implies it was pure Gal- at that time. However, the whole pedigree should be re-screened.

c3 c5

acc. 1184: C2 and D5 are 100/000 only.

call this 17 C4



	Lac	V_1	Ara		Gal
17 C1	−	S	−		+
C2	+	S	−		+ ++
C4	±	R	+	= Gal⁻ Lac⁺ sans doute	−
C5	−	S	−		+
D5	−	S	−		+
C3	+	R	+		Gal⁺ and ⁻.

all unmixed.

cf.

Change from contemporary record, presumably Gal⁻ → Gal⁺ mutation but check Hfr.

x Y10 on M Lac C3 and 3 s.c.i are all Hfr.

DATE: 1159-03 $\boxed{146}$ C3 REF: 100 000.

See 17 in re initial mixup.

History: a /oo complex grew into a clump from which // were discarded and ooooo were pooled to give C3.

1184-19 states that this culture also has 111, to be verified. (It is quite possible that the same error was made then). Indeed!

18; ~~Lac+ V1R Ara−~~ Lac+, − V1S Ara− ~~101~~. ~~Lac+~~

mod check for 100, 001

19

1307
19

DATE: 11 60 A2.

REF:

Previously recorded as Lac+, Ara+ (V_1^s) Also Lac+/Lac− V_1^s for DCG 10/04

α Now pure Lac−! Ara+,− V_1^s.

Try sibs on Lac, Ara; Reisolate 19. for Lac+
(= 2A − F) 2C − n.g.

6/24.

000
010

1.0
.10

111

143

Do not confuse 144

	Lac	V_1	Ara	V_1
A	−	S	+	S
B	±	R	+	R
D	−	S	−	S
E	−	S	−	S
F	−	S	−	S

Is B the (Z) rather than A? No This is ♂

As Lac+ component has died, ~~[illegible]~~ record only the 010 element, and consider the Lac+ line as expired by incident.

1307
21

DATE: 6/6/61.

REF:

	1	2	Found:	4	5	Absent	7	8	9	10
Record:			000 0000	0	1..	...0				
			111 0001	.	...	1..0				
			111 1111	.	...	..10				
					0..	..1.				
					.1.	...0	now.			

6/57: Resol: now mostly Ara' V_1' Lac'

α: also some Lac° Ara° S^r

While no S^0 recombinants are evident, further search is warranted for 000 ... 1 types

To facilitate this, enrich the Mal+ components of present culture.

For check, found: 61G1-0 Ara+ V_1^r = whole.

A − s

C + r

D + r

whole culture is Gal+. Replicate to Y10. for possible ~~[illegible]~~ mt+ (0?) components

brush on BMal, incubate Hay then restreak. Spot Mal+ to BLac. Mal ex is weak, should perhaps have used Xyl instead. ~ 8 Mal+ all Lac− also Lac− Mal−

1304
22

DATE: 11/6/15

REF:

	1	2	3	4	5	6	7	8	9	10
	1	1		1						
α:	Lac	ara		V_1^S					110	
									no ooo now	
10										
20										
30										
40										
50										

DATE: 7/4/07 REF:

1	2	3	4	5	6	7	8	9	10
								000	
								100	
								101	
								001	

All Ara⁻

Replica: Mostly 000.

Many ~~100~~ 100, 101

No 001 seen here. (rebuilt)

↘ Restrict V, R on Mac.

any sets? for 001.

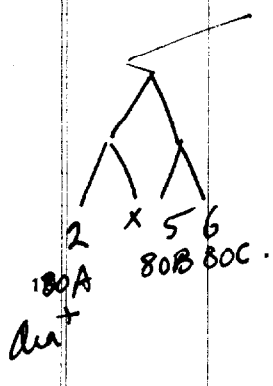
Restrict from V, R → Lac 2 cols/> 100. Rebuilt. ✓ Yes 001

1357
80

DATE: 1207-A4. REF:

206

Recorded as Ara, Lac, Lac.



α: A Lac⁻ Ara+S -R No Ara+V₁ʳ 010 001
B Lac+/- Ara- S. 000 100
C Lac+S/-R Ara- ~~000~~ 001 100

000
001
010
100

Ara+V₁ʳ check A
Lac+V₁ʳ check C.

000 ✓
~~000~~
001 ✓
010 ✓
011
100 ✓
101
110 ×
111 ×

Note this example of early Ara segregation of thus.

of 68.

? 011 = Ara+V₁ʳ Lac⁻ Could this be present in A? No, Ara+V₁ʳ present
101 = Lac+V₁ʳ Could this be in C?
Should be repeated. No Lac+V₁ʳ.

The Fla$^+$ pedigree 1351-88

DATE: REF:

	1	2	3	4	5	6	7	8	9	10
	ara V_1		lac V_1		Xyl sus					
α:	A −S +R B −S C −S	A	(+, −) −S −S	R, S.	+S −R ~~#~~ +S −R −R	? +R	(Fla$^+$)	Mixed Gal$^+$/Gal$^-$.		

∴ 88A seems to include ♂. Basis in pedigree?

It was so listed at the time (1210). However, ~~[illegible]~~ artefact could not be ruled out. It was isolated as pure ♂. but one cell might have been abortive motile ♀

88B: original recorded as MXM$^+$. Has a small Xyl$^+$ S^s component. Replate from this enrichment. (faint rx)

Very faint rx. Almost miscoreable.

88A 1 Gal$^+$ S^s V_1^r
2 Gal$^-$ S^s V_1^r

B Gal$^+$ S^R V_1^S

DATE: REF:

Multi clones: ... only.

1	2	3	4	5	6	7	8	9	10
111-011	111·100	010·101 100·001	010·000 001·100	100 101 001 000	101-001		100-001	~~100 101 001~~	
6 13 36 53 65 71 81	30	68	80	74	10		11	~~[illegible]~~	
7	1	1	1	1	1		1	~~[illegible]~~	

Multi clones. — nil ....

only 29 is segregating M+l. Is it [illegible] available? Omit from analysis

7 111 1000 only

8 $\frac{100}{000} \cdot \frac{1010}{0000}$ plus 010

21. 111·0001 and 111·1111

29 $\frac{000}{111} \cdot \frac{0000}{1111}$

31 $\frac{100}{000} \cdot \frac{0000}{0011}$

35 111·0001 111·0000

55 $\frac{100}{000} \cdot 0010$

58 $\frac{100}{000} \cdot \frac{1000}{0011}$

7/4/57. Semi final analysis 13507

DATE: REF:

(1) Sing. Recombinant clones.

	1	2	3	4	5	6	7	8	9	10
	100		010	001	110	101	011	111		
	1	52	19	not esc.	22	5	26	3		
	2	57	60			8		34		
	4	59				~~[illegible]~~		51		
	7	61				25		54		
	12	62				27		66		
	14	63				56		72		
	15	64								
	16	67								
	17	69								
	20	70								
	24	73								
	28	75								
	32	76								
	33	77								
	37	78								
	79	84								
	82	85								
	83	86								
	~~[illegible]~~									
		18								
	~~36~~ 37		2	—	1	~~4~~ 5	1	6		
add	5		2	4	0	3	7	8		
	41		4	4	1	9	8	14		
add	4		1	1				~~4~~ 4		
	~~45~~ 46		5	~~4~~ 5	1	~~9~~ 8	8	18		

1 Fla
1 Cal

Lac = 45 + 1 + 9 + 18 = 73 should be Lac V, Ara.

Ara = 5 + 1 + 8 + 18 = 32

V_1 = 4 + 9 + 8 + 18 = ~~39~~ 40

~~Smith~~ final 7/4/57

Preliminary resume 1357

51-88

Final 7/7/57

DATE: REF:

#	Exp	code	coz.	sibs	prelim scores	6	7	8	9	Finish
51	1185	C1				111 000		111		>
52		G2				100 000		100		>
53	1186	A1	A2 B12			011 000; 100 No 111		100 011		>
54		C4	C11 C12			000; 111 000		111		>
55		F4	F6	F5	Lac' Mal'	00;10;01 No 11		100 0010; 000 0010		
56		D1	D11			101		101		
57		G1	G12			100		100		>
58		H4	extensive pedigree			.00....		Tetrad *		>
59	1197	D3	D3	C3 H5		100 000		100		>
60°		B4				010		010		>
61		H4	H4	D4		100		100		>
62	1200		D6			100		100		>
63			A3			100		100		>
64	1203-197		a5-a6..			100		100		>
65	1204	D1	D3		~~011 100~~			111 011		
66	1205	B4			~~011 100~~			111		
67	1205	G4			100 ; male?			100		
68	1206	204-5	2;3		001 110; 100 000			010 101 001 100		
69			5			100		100		>
70°			26			100		100		>
71			14 16		111 000			111 011		
72			34 36		111 110?			111		
73			41			100		100		>
74			43		100			100 101 001		>
75-	1207	206-	A1			100		100		>
			B5			100		100		>
			~~A~~D1			100		100		>
			F1			100		100		>
79			G4			100		100		>
80°		A4	A2-5-6		010 001; 000 100; 001 100			001 010 100		
81		207	C1 C3	D2				100 011		
82			B4 A2		100			100		>
83			A4 A6		100			100		>
84			D5 D5		100			100		>
85			G4 D6		(100) now 000			100		>
86	1210	208	D1 d1 d5		100; 100			100		>
87			C1 ~~F1~~ g2		101...			101		
88					Fla+ see pedigree			Fla+		

40

* 100/000 · 1000/0011

50

DATE: REF:

Rewrite Lac V, Ayr:

1	2	3	4	5	6	7	8	9	10
100	45			100					
111	18			111					
101	9			110					
011	8			011					
010	5			001					
021	4			010					
110	1			101					
100·111	1								
·...	1 each.								

The only ~~of~~ frequent mutation is then $\frac{111}{011}$

In fact $\frac{7}{18}$ carrying 111 also carry 011 but 011 is very rare alone. Suggests heterogeneity or interaction

(a) the 100

0	0	0
X		
1	1	1

↓

100.

(b) the 111 yields pair in all regions to give more recombinants.

0	0	0	
1	1	1	X

why ·011 > 111·100? Excess of double crossovers. right of 111?

Final accountings of singe pair progenies

(1153-1210)

DATE: July 7, 1957

Lac Ara Vl (Mtl Xyl) Mal S Gal Fla

REF:

Initial ascertainment included all markers except Vl.

a) Only Lac Ara or Vl segregating . 000 present in (virtually) every progeny

100	111	111/011	101	010	one each:
1 61	3	6	5	19	001 not ascertained
2 62	34	13	8	60	
4 63	51	36	25		100 22
7 64	54	53	27		
12 67	66	65	56		011 26
14 69	72	71			
15 70		81			111/100 30
16 73					
17 75					101/001 10
18 76					
20 77					100/001 11
24 78					
28 79					010/101/100/001 68
32 82					
33 83					010/ /100/001 80
37 84					
52 85					101/100/001 74
57 86					
59					
[37]	[6]	[7]	[5]	[2]	[8] =

(65)

b) Also other markers [10]

7:	111 1000 only ✓	1
8:	100/000:1010/0000 [also 010]	5
21:	111 0001 & 111.1111 ✓	2
29:	000/111:0000/1111	6
31	100/000:0000/0011	7
35	111 0001 111 0000	3
55	100/000:0010 ~~✓~~	~~4~~
58	100/000:1000/0011	8
23	000 0000 1 0	
88	000 0000 0 1	

Total: [75] progenies. How many total pairs?

(1153-1210)

Lac Ara Vl Mtl Xyl Mal S Gal Fla

DATE: July 7, 1957 REF:

Initial ascertainment included all markers except Vl.

a) Only Lac Ara or Vl segregating . 000 present in (virtually) every progeny

100	111	111/ 011	101	010	one each:
1 61	3	6	5	19	001 not ascertained
2 62	34	13	8	60	
4 63	51	36	25		110 22
7 64	54	53	27		
12 67	66	65	56		011 26
14 69	72	71			
15 70		81			111/100 30
16 73					
17 75					101/001 10
18 76					
20 77					100/001 11
24 78					
28 79					010/101/100/001 68
32 82					
33 83					010/ /100/001 80
37 84					
52 85					101/100/001 74
57 86					
59					
[37]	[6]	[7]	[5]	[2]	[8]

b) Also other markers [10]

7: 111 1000 only

8: 100/000:1010/0000 also 010

21: 111 0001 & 111.1111

29: 000/111:0000/1111

31 100/000:0000/0011

35 111 0001 111 0000

55 100/000:0010

58 100/000:1000/0011

23 000 0000 1 0

88 000 0000 0 1

Total: [75] progenies. How many total pairs?

1357
sum.

DATE: July 7, 1957. REF:

Sums: (by progeny, not number of recombinants).

Lac: 37+6+7+5+7+8 = 70 = 75 -(19,60,26,23,88).	70	93
Vl : 6+7+5+7+4 =	29	39
Ara : 6+7+2+5+5 =	25	33
Mal:	6	8
Xyl, S	5,5	7
Mtl	2	3
Gal, Fla	1,1	1

Perhaps a better sequence tha Lac Ara Vl Xyl Mtl Mal S would be one to fit the above, Lac Vl Ara Mal S Xyl Mtl. Where this is done, substitute i/l

This will make the descending order of individual types as follows:

Better S Mal Xyl. MH.

100	i00	~~14~~ 12	1000	00i0	0010	
			1010	i0i0	0110	
111	iii	18	0001	0i00	1000	
			0011	ii00	1100	
011	0ii	8	0010	i000	0100	
			0011	ii00	1100	
101	ii0	8				
010	00i	8	No particular advantage here.			
001	0i0	5	1111		1111	