

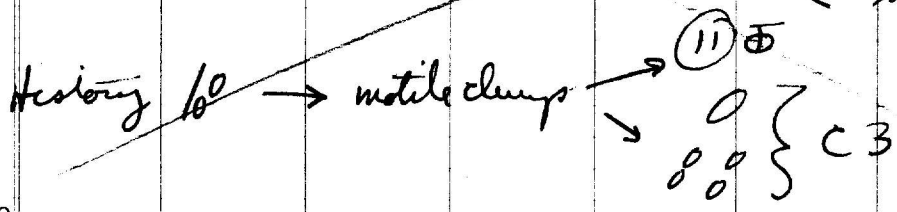
DATE: 1109-C3.

REF:

9/21. Not yet analyzed.
lac V, Ara:

Plated on B Ara: pure Ara⁺.
of culture: lac⁺ V, r.
But unless lac reaction is suspicious. Plate as B Gal!

10 Restreaked 18 on B lac: pure lac⁺ but weak and strong
weak lac⁺ are Gal⁻! (2-3? lac⁻ smallcols)



20 ∴ if σ⁺ is present, not reliable. However, presence of Gal⁻ recombinant
may be valid. So far, 18 sums to carry Ara⁺ lac⁺ Gal[±] / - V, r
contemporary record: M X M - S^R (Gal⁺)
Note: so far identified: Gal⁻ lac⁺ Ara⁺ V, r.

30 Isolates:

- a. Gal⁻ lac⁺ Ara⁺ V, r
- b. Gal⁺ lac⁺
- c. Lac[±]?

Xyl⁺ S^S
 Xyl⁺ S^S
 Xyl⁺ S^S
 Xyl⁺ S^S
 ≡

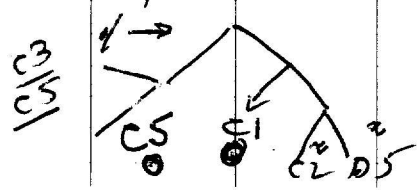
Gal⁻ S^S V, r lac[±] Ara⁺
 Gal⁺ S^S V, r lac⁺ Ara⁺
 Gal⁻ S^S V, r lac[±] Ara⁺
 Gal⁺, - S^S (- more^S than +) V, r
 lac[±] Ara⁺ V, r

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18 is not yet tested as Hal. Is it the σ⁺?

7/2 And after review, find that I have used 145-C3 for these tests. This is the counterpart of C1 = #17, both stated and accepted as 100 0800 types

- 17A = C2
- 17B = D5
- 17C = C1



June 24 1957.

Incomplete numbers.

1357 B.

DATE:

REF:

	1	Formed 3	4	Wanted 6	7	8	9	10
✓✓	6	5JH5.	111 011		000 1000			
✓✓	9	58C1	101		100 001	mostly lac -	000 ✓	000+
	10	C3	101 001 000	✓	100 001 Verify	lac → lac	No	100
	11	D1	100 001 000		Verify			
	12	58						
	13	G5	111 000 011		100			
	18		111 ? ...	GAL!	Verify	Platrol: pure Aca+		
	19	60A2	010 000		1.. (original record)	lac+ dried out.		
	21	61G1	0... 111 0001 111 111		000 111 000 0001	{ (000 00 111 0000 is absent) }		
	28	63C2	Official		Review		1110	
	25	G5	101		(10 001)	not present.		
	26	B6	011 000		010 001	Aca+1-		
	27	64B3	101 000		100 001	were found.		
	29	64D3	000/111 0000/1111		100 001	check		
	30	65A3	000 100	(1.0)	100 001	dat types... all	300B.	
	35		111 000	lac 5 ³	000 100	lac - 5 ³ ?	No lac - Segs. at 12-3.	
	36		111 011		000 100	V ₁ ?		
	55		lac/Md.		Verify ; 001	Schubert's V ₁ ⁵		
	56		101		Verify ;	of 13. 100		
	66		011 100		Verify ;			
	67		100; 110		Verify ;	(B1, B2, B3 in smboth)		
	68		001 110	100 000	"			
	471		111 000		"	100...		
	72		111 110		"	001...		
	74		101		"			
	81		011 100		Verify			
	84		101 only		Verify ;	no V ₁ ⁵ , no lac evident		
	88		Fla		Review.			

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DATE:

REF:

	1	2	3	4	5	6	7	8	9	10
<i>✓</i> 17		100	022							
<i>✓</i> 18		100			?.021 100					
<i>✓</i> 23		111	Gal ^s		pure Ara		111 000 0		111 000 1	ul's?
<i>✓</i> 35		Hfr-Gal					000 0000	111 6000	111 0001	
88		111 000	Lac ^{SF} <i>✓</i>							
		Fla, MXM, Gal?			<i>Phx too much:</i>					
65		011 100	111 000		verify....					
66		011 100	111 000		"					
67 A		100	Gal <i>000 ✓</i>							
68 A		001 110	100 000	101	010 000 "					
71 A		111 000	011							
72 B		111 110	0.00							
74		101	100 000		no 001 sum.					
81		011n100								
89		101								
		001 110 100 000								

✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓
✓

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7

MAY.

1357

7

DATE:

REF:

11581321.

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hac hac, Xgl MHR M&S Cal

Previously found ooo... and 111 1000 0

only

5/57 a and current tests consistent
(17 hac are ooo..)

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DATE:

REF:

1156125.

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4

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Previously identified 4 types:

	Lac	Ara	V ₁ ^S	Xyl	HK	Mal	S	Col.
1	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0
3	1	0	0	1	0	0	0	0
4	0	0	0	1	0	0	0	0
5	0	1	0	0	0	0	0	0

10 However, record showed
Ara⁺ also present.
V₁^S. This now verified
and isolated as V#5.

6/20. Mostly Lac⁺Ara⁻. Very few Xyl⁺ (this also Mal⁺).

20 Altogether 73 Ara⁺ tested: all Lac⁻Mal⁻Xyl⁻. Bowhole culture is V₁^S, so this
defines type 5. See example!

30

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9. Lac⁻ pool: all V₁^S

101

000

no 001

no 100

not tested: Lac⁺V₁^S.

as was brush, 9 has mostly Lac⁻V₁^S; rare Lac⁺V₁^S, ~~transformation~~⁺
~~to plate there~~ no appreciable diminution in T₁ portion. Record
as no 100.

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1387
10

1156 E 3

DATE:

REF:

	1	2	3	4	5	6	7	8	9	10
	Lac VI. Restatement		101	001	000	must be verified ✓ any 100? No				
	Asphate records (+, -) to Lac T1, A									
	1.1	0.0	0.1	indent	No	1.0				

>100
columns

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11

1357
11

DATE: 11/26/01

REF:

loc VI

100 001 000.

Verify. Dec 10

plate: all loc. → pool, contains 000 001

10

In original cross bush, records mainly -R, +S. presumably no +S.

∴ present 000 absent 101.
 001
 100

✓ but repeat cross-bush. : mostly 001 but unambig

20

~~the control~~

30

40

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DHEB G-5

REF:

1	2	3	4	5	6	7	8	9	10
	111	000	011	identified.					

about = prop-lac⁺, -Ara⁺ -

look for 100.

~~200~~ tested already: 27 Ara⁻ are Lac⁻ V₁^S.

An apparent 001 proved to be Tal[±]flu[±] = 13A. probably mutant. of 66

α₁₀ Lac⁺ - V₁^V +S
Ara⁺ -S

plate: Mostly Lac⁺. look for Lac⁺Ara⁻

see: Lac⁻Ara⁺
Lac⁻Ara⁻
Lac⁺Ara⁺
> 100
kots.

1? Lac⁺Ara⁻. Recheck
✓ Lac⁺. Verify Ara⁻.
Ara⁺V₁^R

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DATE: 1159-03

REF:

100 ✓
100

/146/ = A² /145/ = a³ 4 5 6 7 8 9 10

This was quite a scramble, as #18 q.v. was taken as 1159-03 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⁺, V₁^r, motile, but mixed on Gal.

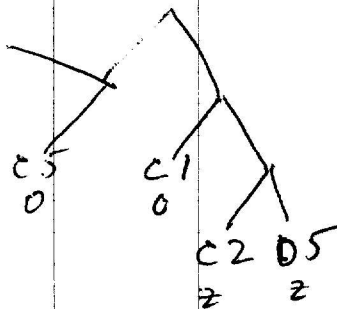
7/2/57

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

10

c3 c5

acc. 1184: c2 and D5 are 100/1000 only.



call this 1784

20

	Lac	V ₁	Ara
17 c1	-	S	-
c2	+	S	-
c4	±	S	+
D5	-	S	-
D5	+	S	-

= Gal⁻ Lac⁺ pseudotype

Gal
+
+
-
+
+

all mixed.

Gal⁺ and⁻.

of

30

c3 + K +

Change from contemporary record, presumably Gal⁻ → Gal⁺ mutations but while 1784.

40

x 410 m M Lac c3 and 3 s.c.i are all 1784.

50

DATE: 1159-03

146 C3

REF:

100

000

1 2 3 4 5 6 7 8 9 10

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 lll, to be verified. (It is quite possible that the same error was made then). *Revised!*

18; ¹⁰ fact, - V₁^S Aca -
~~fact + V₁ R Aca -~~

~~fact~~ ~~fact~~

and checks for 100, 001

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DATE: 11 GOA2.

REF:

Previously recorded as lac^+ , Ara^+ (V_1^s) Also $\text{lac}^+/\text{lac}^- V_1^s$ for DEC 10/54

x Now pure $\text{lac}^-!$ Ara^+ , V_1^s .

6/24. Try also as lac , Ara ; Reiterate 19. for lac^+
(= 2A-F) 2C-n.g.

000
010
010
51.0
2.10
111
111

143
do not compare 144

	$\text{lac } V_1$	$\text{Ara } V_1$
A	-	+
B	±A	+
D	-	-
E	-	-
F	-	-

Is B the ⊕ rather than A? No This is

As lac^+ component resolved, ~~was~~ record only the 010 element, and consider the lac^+ line as a period by accident.

40

50



DATE: 6/6/61.

REF:

Record:

1	2	Frame:	4	5	Marks	7	8	9	10
		000	0000	0	1..	...0			
		111	0001	1..0			
		111	111110			
					0..	..1.			
					.1.	...0	now		

6/5/61:

10 Record: now mostly $\Delta a' V_1' lac'$
 α : also some $lac^+ Ara^+ S^r$
 While no S^r recombinants are evident, further search is warranted for $000 \dots 1$ types
 To facilitate this, enrich the Mal^+ components of parent culture.

For checks, found: 6161-0 $Ara^+ V_1'^2$ = whole.
 A - S
 C + r
 D + r

20 whole culture is Gal^+ . Replicate to 410. for possible ~~some~~ Mal^+ components (89)

30 brush ^{on Mal^+} , imitate Hay then restrict. spot Mal^+ to B_{lac} . Mal^+ is $alc^+ lac^-$
 weak, should perhaps have used Xyl instead. ~ 8 Mal^+ all lac^- Mal^-

50

DATE: 7/4/07

REF:

1 2 3 4 5 6 7 8 9 10

000
100
101
001

Replica: All the
Mostly 000.
Many ~~too~~ 100, 101
No 001 seen here. (submesh)
Restrict: V, R on 100.

any sites? for 001.

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

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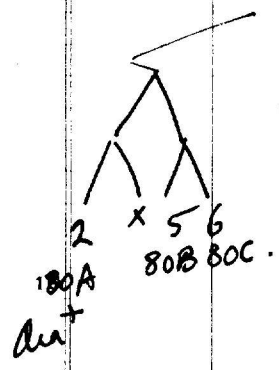
1357
80
✓

DATE: 1207-AY.

REF:

1 [206] 2 3 4 5 6 7 8 9 10

Recorded as Ana, Lac, Lac.



α: A Lac⁻ Ana⁺S⁻R
 B Lac⁺ Ana⁻S
 C Lac⁺S⁻R Ana⁻

No Ana⁺V₁⁺ 010 001
 000 100
 000 001 100

000
 001
 010
 100

Ana⁺V₁⁺ 000 ✓
 check 001 ✓
 010 ✓
 011 ✓
 100 ✓
 Lac⁺V₁⁺ ← 101 ✓
 check C. 110 x
 111 x

Note this example of
 early Ana signature
 of 68.

? 011 = ana⁺V₁⁺ Lac⁻ Could this be present
 in A? No, ana⁺V₁⁺ present
 101 = Lac⁺V₁⁺ could this be in C?
 should be repeated. No Lac⁺V₁⁺ ✓

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The Fla⁺ pedigree

1357-88

DATE:

REF:

	1	2	3	4	5	6	7	8	9	10
	anaV ₁	lacV ₁			Xyl ⁺ var					
α:	A -S +K B -S C -S	A -S -S	(+, -)	R, S.	+S -R *+S -R -R	? +K		Mixed Gal ⁺ /Gal ⁻ .		
								(Fla ⁺)		
10	<p>∴ 88A seems to include ♂. Basis in pedigree? It was so listed at the time (1910). However, the attempt could not be ruled out. It was isolated as pure ♂. putative cell might have been abortive male ♀</p>									
20	<p>88B: original recorded as MIXED⁺. Has a small Xyl⁺ S^s component. Replate from this inoculum. (faint rx) Very faint! Almost unrecognizable.</p> <hr/>									
88A	<p>1 Gal⁺ S^s V, V 2 Gal⁻ S^s V, V</p>									
B	<p>30 Gal⁺ S^R V, S</p>									
40										
50										

DATE:

REF:

Multi classes: 2 ... only

	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	101-021	100-001	100-101-001	
	6	30	68	80	74	10	11	7	
10	13 36 53 65 71 81								

20	7	1	1	1	1	1	1	7	
----	---	---	---	---	---	---	---	--------------	--

Multi classes. — incl ...

7
308
100/000 · 1010/0000 plus 010

only 29 is segregating M.H.
As to 0...
available
Omit from analysis

21. 111-0001 and 111-1111

29
40
002/111 · 0000/1111

31
100/000 · 0220/0011

35
111-0001 111-0000

55
50
100/201 · 0100/220

58
100/201 · 1000/0011

7/4/57.

Semifinal analysis

13507

DATE:

REF:

	(i) Recombinant clones			5	6	7	8	9	10
	100	010	001	110	101	011	111		
	1 52	19	not rec.	22	5	26	3		
	2 57	60			8		34		
	4 59				8		51		
	7 61				25		54		
	12 62				27		66		
	14 63				56		72		
	15 64								
10	16 67								
	17 69								
	20 76								
	24 73								
	28 75								
	32 76								
	33 77								
	37 78								
	79 84								
20	82 85								
	83 86								
	84								
	18								
30	36 37	2	—	1	5	1	6		
add	5	2	4	0	3	7	8		
40	41	4	4	1	9	8	14		
add	4	1	1				4		
	45 46	5	5	1	8	8	18		
	Lac = 45 + 1 + 9 + 18 = 73				should be	Lac V, Ara.			
	Ara = 5 + 1 + 8 + 18 = 32								
50	V ₁ = 4 + 9 + 8 + 18 = 39								

1 Fla
1 total

~~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	G1			111	000			>
52		G2			100	000			>
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		>
			MZD1		100		100		>
			FL		100		100		>
79			G4		100		100		>
80		A4	A2-5-6	010 001; 000 100; 001 100			001 010 100		>
81	207	G1	C3 D2				100 011		>
82		B4	A2	100			100		>
83		A4	A6	100			100		>
84		D5	D5	100			100		>
85		G4	D6	(100) new 000			100		>
86	1210	208	D1 a1 a5	100; 100			100		>
87		C1	7PA 82	101...			101		>
88				Flat see pedigree			Flat		>

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

50

DATE:

REF:

Rewrite, fac V, Aug:

1
100
111
101
011
010
021
110

2
45
18
9
8
5
4
1

102
111
110
011
001
010
101

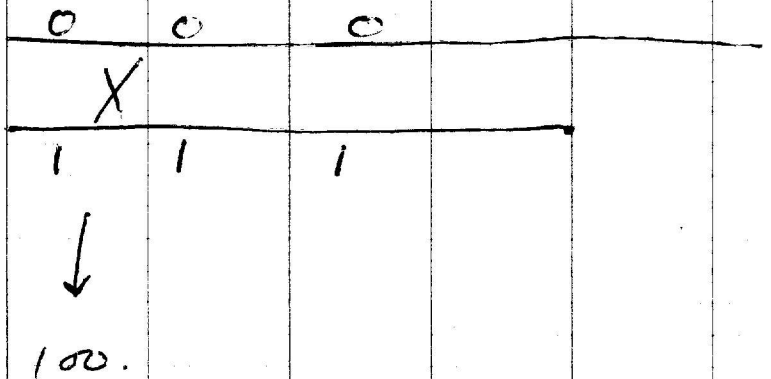
10 100-111
....

1 each.

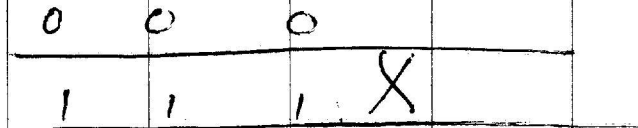
The only frequent mutation is then $\frac{111}{011}$

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

(a) the 100



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



50 why $\cdot 011 > 111 \cdot 100?$ Excess of double crossovers. right of 111?

(1153-1210)

Lac Ara Vl (Mtl/Xyl) Mal S Gal Fla

DATE: July 7, 1957

REF:

Initial ascertainment included all markers except Vl. 7 8 9 10

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		
10 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					
20 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 ✓	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.

7

8

9

10

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		120 22
7 64	54	53	27		
10 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					
20 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]

30

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
40 35	111 0001 111 0000
55	100/000:0010
58	100/000:1000/0011
23	000 0000 1 0
88	000 0000 0 1

50

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

1357
sum.

DATE: July 7, 1957.

REF:

1	2	3	4	5	6	7	8	9	10
Sums: (by progeny, not number of recombinants).									
Lac:	37+6+7+5+7+8	= 70	= 75	-(19,60,26,23,88).		70	93		
VI :	6+7+5+7+4	=				29	39		
Ara :	6+7+2+5+5	=				25	33		
Mal:						6	8		
10 Xyl, S						5,5	7		
Mtl						2	3		
Gal, Fla						1,1	1		

Perhaps a better sequence than Lac Ara VI Xyl Mtl Mal S would be one to fit the

20 above, Lac VI 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	18	1000	00i0	00i0	00i0
			10i0	i0i0	0i00	0i00
111	iii	18	0001	0i00	00i0	1000
			0011	ii00		1100
011	0ii	8	0010	i000		0i00
			0011	ii00		1100
30 101	ii0	8	No particular advantage here.			
010	00i	8				
001	0i0	5				

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