January 29 ~~30~~, 1948.

Remove most Ca from crude preps. Ca Maltobionate + Ca Lactobionate ppd. by KP Link by Bromine Oxidation. EMB tests.

Streak out, on ~~Lba~~. Lba:

Y10	—	No papillae noted.
Y87	—	Colonies markedly papillate 2–5 / colony. Streak out *
W45	—	Occ. papillae 0–1–2 / colony
W108.	—	Tiny but fairly numerous papillae!

* → Lba – and Lba + types. Purify and describe as W115 Test on lactose: Thus wild type Lac+ is Lba –.

Maltobionic Acid:

Y10	—	No papillae noted. W60: may be very slow +.
W60	—	
W56.	—	
W108	-	Numerous small papillae (3-6 / colony).

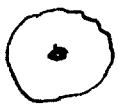
On second day, the original papilla restreaked on Lba did not remain + but all colonies were faint purple. On lactose W115 is +++ but, apps. still Lba. –

Streak out papillae again. ~~Jan.~~ 2/1/48.

All Lba - negative! (What are the papillae?? (Val[n]?))

58-161 } incc. into Lba mannitol. No growth
Y10

The following sectors gave + and − colonies.

		Mal	glucose	TI	w -
41.		+	+	S	139
42.		−	−	S	164
43.		−	−	S	165
44.		+	+	S	140
45.		+	+	S	141
46.		+	+	S	142
47.		+	+	S	143
48.		+	+	S	144
49.		−	−	S	166
50.		A few lac+ in heavy streaks.	−	S	167

Jan 31, 1948 Feb. 1, 1948.

410.

182 plates x ca or > 500 colonies readable per plate, average.

= ca. 100,000 colonies.

Most mutants are intact colonies rather than sectors. Streaks out on EMB Lac.

Irradiate 10^8 cells/plate 75 secs. under Watson's low pressure Steriamp. Killing very variable. Apparently smaller proportion of sectors among mutants 1-39 intact white colonies. Test when pure:

	Maltose	Glucose	Gal.	TI	W-
1.	−	−	±		146
2.	+	+	+		120
3.	−	−	±		147
4.	+	+	+		121
5.	−	−	±		148
6.	+	+	+		122
7.	−	−	++		149
8.	+	+	+		123
9.	+	+	++		124
10.	+	+	Gal-		125
11.	−	−	++		150
12.	−	−	Gal-		151
13.	+	+	+		126
14.	−	−	±		152
15.	−	−	Gal±		153
16.	−	−	±		154
17.	+	+	++		127
18.	+	+	+		128
19.	−	−	−		155
20	−	+	++	S	145
21.	− +	+	−		129
22.	+	+	−		130
23.	+	+	−		131
24.	+	+	++		132
25.	+	+	++	S.	133
26.	−	±	±		156
27.	−	−	±		177
28.	−	−	±		157
29.	+	+	+	S.	134 168
30					168 134

	Maltose	Glucose	TI	W-
31.	+	+		135
32.	+	+		136
33.	+	+		137
34.	−	−		159
35.	−	−		160
36.	−	−		161
37.	+	+		138
38.	−	−		162
39.	−	−		163

Sectorial:

40.

41.

42.

43.

44.

45.

46.

plates too dry for T1

39a:

2 recov for Gal tests

LM	Val.
1	±
2	++
3	±
4	++
5	±
6	++
7	++
8	++
9	++
10	−
11	++
12	− thin
13	++
14	±
15	− th
16	±
17	++
18	++
19	− th
20	++
21	− th
22	++
23	++
24	++
25	++
26	++
27	±
28	±
29	±
30	++
31	++
32	++
33	++
34	− th
35	±
36	±
37	++
38	− th
39.	±
41	++
42	±
43	
44	++
45	++
46	++
47	++
48	++
49	±
50	± (th)

Dna (gluconic ac.) Mutation Rem. 104.

Feb. 3, 1948.

Y10

A). 10^9 cells per plate 3 mins. under Watson's Steilamp.
6 plates x 500 = 3000 colonies.

B). 10^8 cells. 75 secs steilamp. ca 1/3 unreadable.
40 plates x 500 = 20,000.

No very clear cut colonies or sectors. Streak out suspicious colonies.

1 slow on gluconic from A. (intact colony). W169.

2. Gluconic – from B.

1. intact W170
2. (colony) + W171
– W172

Compare:

	glucose	galactose	Gluconic	Lactose	Maltose	Arabinose	T1
W169.	–	±	±	–	–	±	S
W170	+ v.s.c.	++	++ v.sm. col.	++	++	++	S
W171	++	++	++	++	++	++	S
W172.	++	+ and – (diving).	–	++	–	++	S

W169 is lactose slow or negative.

W172 is mixpleiable! Dna – Maltose – Galactose ±?

Repeat these tests!

W145.	++	±	–	–	–		S

W117 x Y40.

W108 - reversion or glucose mutation

Feb. 2, 1948.

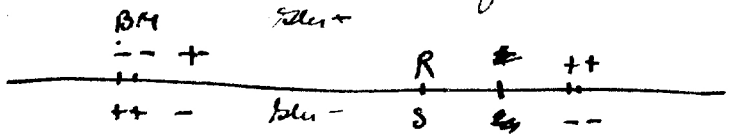
On EMS-glucose. Cross W117 (W118 glucose partial reversion) x Y40 (wild standard). and look for glucose - recombinants.

Feb. 5, 1948.

Glu+ easily distinguished from residue of Glucose- or ±. Two classes of latter cannot be directly distinguished on the EMS-glucose cross-plate. Majority of colonies Glu ±.

Stock out most likely Glu- on Glu EMB and compare with W108 and W117.

Glu+ Glu ±
7 189.



∴ ~~Glu- is located near Tl. Most Glu+ should be~~
∴ Glu is located near BM. (in neighborhood of Mal$_1$).

Check by distribution of V_1^R/S

Glucose ++.	V_1^R	V_1^S
	13	5
	5	4
	16	4
	14	5
	12	5
	58	23

Glucose ±	V_1^R	V_1^S
	1	0
	16	3
	8	1
	11	6
	14	5
	50	15

This is essentially similar to behavior of Mal$_1$ (W-1).

Glucose- and Glu ± are difficult to distinguish. Among ca 2000 colonies, pick the most likely - types and compare also with W108, W117 and Y10:
23 examined — 4 glucose - found. These are quite distinguishable from Y117. ∴, presumably a suppressor mutation can take over the functions of Glu$_1$ - . ~~Therefore~~

(over)

Purify the four glu- recombinants and compare with Y10 ~~and~~ W117 and W108 on glucose EMB.

	24h.	48h.
Y10	+++	✓
W117	—	++
W108	—	—
-1	—	—
-2	—	—
-3	—	—
-4	—	—

l-Arabinose mutations rum.

Feb. 4, 1948.

Quadrate 58-161 on Ar. EMB plates.

20 plates. Colony dimorphisms on galactose noted.
× 300 = 6,000 cols.

(A). Take Ar^S and Ar^R and test on Ar, gal. plates.
Same differential on glucose, Arabinose + galactose!

(B). 3 possible mutants noted.

		Ar.	Gal.	
1.	intact	slow		w-174
2.	"	—		w-175
3.	●	v. tiny colony.	+ and −	+ and −	w-176, 177
4				
5.				

Galactose mutations nos.

Feb. 5, 1948.

Y10. 50 plates × ca. 150 scorable colonies → 7500 colonies.
3 suspicious colonies streaked on gal EMB.

1.  + and − W-180
2. do. + and − W-181.
3. 0

Feb. 6, 1948

58-161 (S and R) mid-late 10^8 cells/plate 85 seconds. Watson's lamps.
on Lac EMB.
75 plates × 300 survivors = ca. 22,000 scorable colonies.

Picks. P7 & streak out. Following mutants obtained:

		W-	
Extract Cols.	1.	182	–
	2.	183	–
	3.	184	–
	4.	185	–
Sectorial	5. 	186	–
Critical	6. 	187	slow – +++ in 48 hours.
	7. 	188.	–
	8. O	189	slow growing.

Retest:

	Lac	Mal	Gal	Glu	Sna	Xyl	Ara
182							
183							
184							
185							
186							
187							
188							
189							

Cross-test Lac Mutants.

Feb. 6, 1948.

Cross:	×	A W-45	B Y-87	
W-120		++ +	+(1/300)* OK	1 plate each. Each plate had at least 500 scoreable colonies unless spec
121		++ −	− Lac,−	
122				
123		++ +	− Lac,−	
124		++	− Lac,−	
125		++ −	+(2/50)* OK slow +.	
126		++ −	+(3/1000)* OK	
127		++	− Lac,−	
128		++ (−)	−	(No effect?)
129				
130		++ +	− (<100 colo.) Lac,− * OK :−	
131		++	− Lac,−	
132		+		
133		++ −	±(1+/1000)* OK	
134		++	− Lac,−	
135		++	− Lac,−	
136		++	− Lac,−	
137		++	− Lac,−	
138		++	− Lac,−	
139		++	− Lac,− ~~(Slow!)~~	
140		++ −	1/1000+ * OK	
141		++ ✓	−(slow±?) Lac,−	
142		++	− Lac,	
143		++	− Lac,	
144		++	− Lac,	
156		++ (+)	+(1/100) + OK	(See 115a.)
~~145~~				

Note smaller * ofcolonies ++'s. and repeat cross.

February 8, 1948.

W-145 is Lac- Mal- Pur+.

Cross with W45, Y87 to exclude alleleism and with (Y40) to determine whether one or more mutations are responsible for the Lac-Mal- state. Cross on Lac and on Mal medium.

W145 × Y87 → ++ Lac+.

W145 × W45 → No colonies ✓ (Hold). } on ~~lactose~~ lactose EMS.

W-145 × Y40 on maltose → heavy growth in background; numerous +

(Plates may have had same pedigree!) do. Lac.

Pick from Lacs to Mal EMS + vice versa.

Lac+ tested on Mal.:

Mal+	Mal-
98.	0 ~~+? to be rechecked~~.

Mal+ tested on Lac:

+	-
102	0.
200	0

∴ No Recombinants found in which Lac- was separated from Mal-.
in 200 tests.

Febr. 7, 1948.

A. On Glucose EMS:
W108 × Y40

B. W117 × Y40. C. (Feb. 8) W116 × Y40.

Both crosses give Glu ++ and Glu "−". Although, as a whole, the "−" colonies in B are darker than in A, they are not readily distinguished on this plate.
Pick "−" colonies at random from A and B and streak out on Glu EMB.

A. All − (15)

B. All ± (24).
+ after 2 days.

~~Streaked likely from B. as before.~~

C. 200 Glu + colonies. No −

C-source utilization + selective reversion.

Feb. 9, 1948.

1 (m) + .05%: Mor. W-117 P9.

	A-11	P14
1. Glucose	+++ *	✓ ***
2. Lactose	++ *	+++ ***
3. Maltose	++ *	+++ ***
4. Ammonium Acetate	+++	+++
5. Sucrose	−	−
6 "	−	−
7 Raffinose	−	−
8 "	−	−
9 Cellobiose	±	+
10. α Meglue.	−	−
11. Lactobionate	No growth. Granular sediment. −	

* Streak out.

	Lac	Mal	~~Glu~~
1.		All −	
2.	+++ and + colonies.		
3.	+ and −	+ and −	

~~(Test Lac+ or Glucose.)~~

**

	Lac	Mal	Glu
1.	All − or −I	All − or −I	All + (117 type)
2.	++ and −	++ and −	+++ and +117 (hard to score at 48h.)
3.	++ and −	++ and −	do.

Purify 3++ as W−

(See over.)

Evidently, selective pressure of glucose on W-117 is inadequate to force development of Lac_3^+ types. Lactose, however, ~~xxxxxx~~ and maltose, however, impose a more stringent differential so that the type $Sl_3 + Lac_3^+$ develops.

About 20 Mal+ and 20 Lac+ were tested on glucose. All +++.

Test Lac+/Mal and UV.

February 16, 1948.

From 112 *** plates, Lac+ colonies were studied on Mal, and Mal/Lac.

of 30 Lac+ colonies, 12 were Mal ±. 1-12

of 27 Mal+, 8 were Lac-. 13-20.

Recheck and purify on Lac + Mal. First readings: 24 h.

	Lac	Mal	
1	+	−	
2	+	−	
(3)	+	−	W − 236
4	+	−	
5	+	−	
6	+	−	
7	+	− slow ±	
8	+ slow	−	
9	+	−	
10	+	−	
11	+	−	
12	+	−	
13	−	−	
14	−	−	
15	−	−	
16	−	−	
17	−	−	
18	−	−	
19	−	−	
20	−	−	

February 19, 1948.

P18 from W108 heavily ~~tau~~ into T(m)+.

A. Lac B. Mal.

		P19	P20
P19.	Lac	+++	✓
	Mal	-	+++

Streak out Lac on Lac and look for specific reversions. Do Mal 2/20

	Lac+ on:	Maltose	Glucose	
112 B1		69 -	85 -	These reversions are apparently Lac+ Mal- Glu- !
112 B2		0 +	0 +	

Most of the Mal- are faintly purplish.

Select 2 and streak out on the three media.

	M.	B.	Lac.	
1.	Smooth, faint pink 48h. + purple.	= 24h. No pink.	++	W-
W108	-	-	-	
W117	-	+±	-	
2.	Rough, white	= 24h.	++	W-

After 60 hours, most of the 69 Lac+Mal- turned a fairly deep purple on maltose as +/-, but were glucose -. Pick to stants as W-251 and W-252

	Maltose	Glucose	Lactose	
Mal+ on: (24h.)		71± 7-	65+ 2-	

Retest Sample of each group on each:

		24h.	+24h.						
48h.	1	+	+	-	-	-		W-327	M+B-L?
	2	-	-	-	-	-			
	3	+	+	-	±	+			
	4	+	+	-	±	+			
	5			+	-	+	+		
	6	+	+	-	-	+	+	W-328	M+B-L+
	7	+	+	-	-	+	+		
	8	+	+	-	-	+	+		

Lac Mutation Run.

Feb. 12, 1948.

Y10 (S.C.I.) 10^8/plate. 80 secs. (Watson's lamps).
90 plates x ca. 800 per plate. 72,000 colonies.

Sectors: w — w-

	1. 	190
	2. 	191
	3. 	192
	4. 	193
Nat. col. subs.	5. 	194
	6. 	195
	7. 	196
	8. 	197.

Also: 32 intact white colonies.

Lac test - crosses. Checks.

Feb. 10, 1948.

Y87 (Lac, -) x : on EMS' Lac

	Lac +	Lac −
1. W-120.	1	1000
	0	200
	1	1000
	0	1000
	1	1000.
	3	
	1	/ 750.

W120 Not Lac, −

2. W-125.	0	2
	6	9
	1	2
	1	2
	3	4
	12.	19

W125 Not Lac, −. Not $\stackrel{al}{=}$ W-120.

3. W-126.	0	30
	0	30
	0	40
	2	300.
	2	400.

W126 Not Lac, −

4. W130	0	100
	0	100
	0	100
	0	100
	0	100.
	0	500.

~~Allelism indeed~~.

5. W-133	2	100
	0	200
	1	100
	1	100
	2	500.

Not Lac, −

Contd.

	Lac +	Lac -	
W-140.	0	100	
	1	200	
	1	200	
	1	200	
	0	200.	
	3	900.	Not $\stackrel{al}{=}$ Lac, -
W-156.	0	100.	
	0	200	Probably $\stackrel{al}{=}$ Lac, -
	0	100	
	0	200	
	0	300	Phenotypically Y53. ✓
	0	200	
	0	200	
	0	300	
	0	300	
	0	1900.	

Lac Cross-Tests.

Feb. 12, 1948.

On EMS-Lac

A. W-145 × W-45

B. W-145 × Y87. (1 or 2 plates).

C. W-145 × Y40.

D. W-128 × W-45

E. W-128 × Y87.

E:.

Lac+	Lac-
-	100
-	100
-	300
-	100
-	200
-	400
	150.
	800
	400
	100
0.	2400
0	350
	3750.

∴ W-128 is (Lac$_1$ −). Not phenotype and compare with Y53.

0 Recombinants in 2750 tests.

A. 4 plates. No colonies!

B. 6 4 + the small On adequate incubation 8+ : 288 −
6 ?
= 3% Lac+ recombinants.

C. ++ ++

D. 3 plates. No colonies. [What is wrong with W-45?].

Feb. 12

1% glucose

108 grown in YB Test n:

Set up 12 N	Glu	Glu+Gal	Gal	Sra	Ara	Glu+Ar.	Ara Gal	M. Gal.
230	+	++±	+	+++	+++	+++	−	−
430	++	+++	++	⌣	⌣	⌣	−	−

Reverted!? (W-117?). N.G.

type

Characterization of Mutants.

Feb 9, 1948.

		W-	Lac	Mal	Glu	Glucan	Xylose	Arabinose	Butyl gal.	Methyl gal.	GAL.
	1	182	−	± +	++	++	+	++	± ++	± +	
	2	183	−	++ ✓	++	++	+	++	+ ++	− + ±	
	3	184	−	± ±	++	++	+	++	++	± +	
	4	185	−	− − (−)	− + ++	− − −	− (−)	− +	− − (−)	− − −	
	5	186	−	++	++	++	+	++	++	+ ++	
	6	187	−	− − (−)	− − +	− −	+	+	++	± +	
	7	188	−	± − (−)	− − (−)	−	+ +	− (−)	− ++	− (−)	
	8	189.	−	− − (−)	− − (−)	−	+ (−)	− −	− − +	− −	
	9	108.	−	− − −	− − (−)	+	+	+ + ✓	+ ✓	− ±	
	10	174	± + ++	± + (±)	− + ++	+	+	± ++	✓	+ ++	
	11	175	± +	− +	± ++	+ ++	+	− − ±	✓	++	
	12	177	± +	− +	± ++	+ ++	+	+ ++	✓	++	
	13	X ~~169~~ 112	− −	++ ++	· ·	+ ++	+	+	− ✓ (−)	− − (−)	
	14	X ~~172~~ 143	− −	++ ++	· ·	+ ++	+	·	+ ++	++	
	15	145.	− −	− − (−)	++	− − −	+	−	− − −	− − −	
	16	116	++ ✓	++	++	+ ++ ✓	+	·	+ ++	++	
	17	117	− −	− (−)	− + ±	− +	+	·	++	+ + ±	
	18	180	− ±	+ ± ±	· ++	− − −	+	·	++	++	
	19	181	+ ✓	· · ✓	− ±	− − −	+	·	++	++	
	20	120	− −	− ++ ✓	++ ++	+ ++	+	·	− − (−)	− (−)	
	21	125	− − −	++	++	− − ±	+	+	− − (−)P	− (−)P	
	22	126	− − −	++	++	+ ++	+	·	− (−)	− (−)	
	23	130	− − −	++	++	±	+	·	+ ++ ✓	+ ++	
	24	133	− − −	++	++	++	+	·	− − ±	− (−)	
	25	140	− − −	++	++	++	+	·	− − (−)	− (−)	
	26	156	− − −	++	++	++	+	·	++	++	
	27	121	− − −	++	++	++	+	·	++	·	
	28	123	− − ✓	++	++	++	+	·	++	·	
	29	128	− ✓	++	++	++	+	·	− − (−)	− − (−)	
	30	142	− ✓	++	++	++	+	V	+ +	+ +	

Bac 6P9

− 8A10
− 2P10
− 6P10
− 9A11

Note 108 on Butyl-β-galactoside. Try W-108 on galactose and on glucose + galactose!

Lac Crosstests:

① BM mut. × W-126.

Feb. 14, 1948.

	On Lac EMS'	W-126 ×	
1.	W 35	++ ✓	
	40 ~~not ++~~	±1/1000, 3/1000.	
	42 " "		
2.	43 "		
3	45	++ ✓	
4	48	0/500 0/600	Allel.
5	65	2/500 1/400 ±	
6	67	0/600; 0/600.	Allel.
7	72	+± +±	
8	74	2/400; 3/200 +	
9	76	1/500 2/500 ±	
10	83	0/500; 0/500	Allel.
11	W87.	3/600, 2/600. ±	
	182	1/600; 5/500 +	
	~~Y53~~ 183	3/600; 2/600 ±	~~W-126~~.
	186	1/400, 3/400 +	
12.	182 × ~~W6~~ Y53	1/600 0/600. ± ?	
13.	183 × Y53	0/600; * 0/500	
14.	186 × Y53	0/600, ①/600 *	

are these ++'s artifacts?

Streak out parentals + the sole +'s.

* Streak out. 186B: good ++. do. 182B.

W-83; W-67; W-48 may be regarded as Lac_4 –

W-35, 45 and 72 are probably Lac_2 –

W-40, 65, 74, 76, 87, are probably additional loci.

Feb. 14, 1948. Test on EMB:

~~76. 54. Y40 UV — } Lac sectors~~
~~77 54 Y40 ++ ± } —~~

	Glu	Gal	Gna	Me Gal	Bu Gal.
W-108	—	+± *	++	+	+++
Y53	+++	+++	+++	±±	+++
W117	++	+++	+++	±±	+++
W45	+++	+++	+++	—	—
W128	+++	+++	+++	—	—
Y10	+++	+++	+++.	+++	+++
W145.	+++	±± *	—	—	—

* peculiar brilliant purple shade. Bleached in mass streak

108 on galactose is enzymatic.

● Streak out W-108 on glucose and galactose:

Glu All —

Gal Two types of colonies: ① Fairly strong Gal +
② Stained in center, clear periphery of colony.

Galactose is utilized by W-108. Maybe two colonial types.

Repeat, 2/15, 2/17.
Y108 is Glu - Gal + !

2/17/48. Gal Gna
W-2 on EMB. +++ +++
may be a little slow ⊙ ●

Characterization:

	Glu	Gal	Sna	Lac	Mal	
189		++				
190	++	++	++	−	++	
191	−	+	++	−	−	108 type
192	++	++	++	−	++	
193	++	++	++	−	++	
194	++	++	++	−	++	
195	−	+	++	−	−	108 type
196	++	++	++	−	++	
197	++	++	++	−	++	
198	++	++	++	++	++	
199	++	++	++	++	++	
200	±	++	++	+	±	
201	++	++	++	−	++	
202	++	++	++	−	++	
203	−	+	++	−	−	108 type
204	−	+	++	−	−	108 type
205	++	++	++	−	++	
206	++	++	++	−	++	
207	−	+	++	−	−	108 type
208	++	++	++	−	++	
209	++	++	++	−	++	
? 210	++	++	++	++	++	
211	++	++	++	−	++	
212	++	++	++	−	++	
213	−	+	++	−	−	108 type
214	++	++	++	−	++	
215	++	++	++	−	++	
216	++	++	++	−	++	
217	++	++	++	−	++	
218	++	++	++	−	++?	
219	−	+	++	−	−	108 type
220	++	+	−	−	−	145 type
221	++	++	++	−	++	
222	++	++	++	−	++	
223	++	++	++	−	++	
224	−	+	++	−	−	108 type
225	++	++	++	−	++	
226	−	+	++	−	−	108 type
227	−	+	++	−	−	108 type.
228	++	++	++	−	++	
229	−	++	++	−	±	108 type
[illegible]						

Feb. ~~16~~ 16, 1948

A. W-45⁻ × W-

		A	Megalac.*
1	190	++ ✓	
2	192	++ ✓	
3	193	++ ✓	
4	194	++ ✓	
5	176	++ ✓	
6	197		
7	201	++ ✓	
8	202	++ ✓	
9	205	++ ✓	
10	206	++ ✓	
11	208	++ ✓	
12	209		
13	211	++ ✓	
14	212	++ ✓	
15	214	++ ✓	
16	215	++ ✓	
17	216	++ ✓	
18	217	++ ✓	
19	218	++ ✓	
20	221	++ ✓	
21	222	++ ✓	
22	223	++ ✓	
23	225	++ ✓	
24	228	++ ✓	

B. Y-87 × W-

B	
0/100	LAC, -
+/1 col.	X
0/20	~~LAC, -~~
0/200	LAC, -
0/100	LAC, -
0/100	LAC, -
1/100	LAC x
0/100	LAC, -
0/100	LAC, -
0/100	LAC, -
0/600, 0/700	LAC, -
* 0/200 0/500	LAC, -
0/200 1/200	X
2/400 0/80	X
1/300 1/300	X
0/200 0/200	LAC, -
0/300 0/200	LAC, -
3/3+ 7/10+	X
0/500 1/200	X
0/100 0/100	LAC, -
0/500 0/300	LAC, -
0/700 0/500	LAC, -
0/600 0/200	LAC, -

W-188 * W-108.

+ and - colonies found. W-188 is Glu$_2$ -
Some intermediates possible. Streaks out

All Lac, - except: 192, 193?, 201, 212, 214, 215, 217, 218, 221. of these, 192 + 218 are in one group, the remainder in another

n glucose. 3 da.
W188 3-4+/200 -. Cross results uncertain. Needs purification.
No intermediates noted on purification of suspected prototrophs. (Change due to drying out + colony darkening.)

* Test streak vs Megalac. EMB 2/23/48.

Lac Mutants Cross-Tests

Febr. 16, 1948.

	Cross on EMS-Lac B_1.	A x W-45 (Lac_2)	B x Y-87 Lac_1	C x W-67 Lac_4	
	W--	A	B	C	
1	120	++ ✓	2/700 1/200	0/400 0/400	
2	122	+++ ✓	0/300 3/400	0/500 0/400	
3	125	++ ✓	++	++ ✓	Lac 6
4	132	++ ✓	0/600 0/600	0/600 0/600	All. Lac, and Lac$_4$
5	133	++ ✓	3/400 6/600	0/200 2/600	"Not Lac, or Lac$_4$"
6	140*	++ ✓	0/200 0/200 ✓	0/500 0/400	Either (1) or (4)
7	145	+++ ✓	++ ✓	+++ ✓	

* By mistake, 144 was grown instead of W140. Cross was therefore attempted with cells scraped from stock slant of W100.

132 and 140 both gave no Lac + either $\bar{c}$ Lac, or $\bar{c}$ Lac$_4$

133 gave Lac + $\bar{c}$ both. 120 & 122 are Lac$_4$

February 17, 1948.
R
58-161 > C-1.

95 plates × ca. 200 (v. uneven) = 19,000 colonies.

			Glu	Gal	Lac	Mal	Sna
Retest on EMB Streaks. 2/18.	W-237.	◐	++	++	−	++	++
	W-238	◕	++	++	−	++	++
	-239	○	−	N.G.	−	N.G.	−
	-240	"	++	++	−	++	++
	241	"	++	++	−	++	++
Slow +	242	"	++	++	+	+	++
	243	"	−	++	−	−	++
	244	"	++ ++	++	−	++	++
	245	"	−	− !	−	−	++
	246	"	++ ++	++	−	++	++
	247	"	++ ++	++	−	++	++
	[redacted]				[redacted]		
	248				−		
	249				−		
	250				−		

Types: Lac − 237, 238, 240, 241, 244, 246, 247

Glu − 239, 243, 245. See p. 129

February 10, 1948.

1. Streak out W-128 on ~~Methyl~~ Methyl 3-d-galactoside and on lactose
A 18 All -; No papillae.

A 20 all - No papillae.

P 22 Do.

Heavy inoc. into T(m) + Lac + fungal.
2/20 —
P 22 —

W-128 is completely stable.

(2.) Streaks out W-138 on lactose & compare with ~~to~~ Y87; Y53.
[Esther says W-138 is slow +]

A18. All -. No papillae
Y87 is papillate

A 20. — Not slow +. No papillae.

A 21 — Slow + ! lactuals.