10/20 ff/sd.

Strains rec'd. from Wis. Public Health Lab.
For details, see protocol book.

	Strain	Comment	$X^+ S^R$ (uncone. with.)	$X^+ S^R$ washed conc.
1	~~93940~~	SR		
2	—	clear antagonism K-12(?)	0	0
3	—		0	0
4	—		0	0
5	93940		0	0
6	94024	SR	—	—
7	93941		0	0
8	94043	strong inhibition of K-12.	0	0

W1362. 22 of $X^+ S^R$. All Lac+ on EMS. Some of these appear Mal−. Reisolate 1362a & b (single colonies) and repeat cross.

10/25/ff #9–30 (excl. 18, 19 as SR). Very concentrated inocula to DSM from x1177

9	0	
10	0	
11	0 0	
12	0	
13	ca 100	= W1373 Pick to EMS Lac: 7+: 24− ! Recombination →
14	0	Smr, rather mucoid
15	1	
16	0	
17	0 0	
18		
19		
20	0	
21	0	
22	0 0	
23	many colonies. coli??	
24	0	
25	0	
26	20	= W1374 Pick to EMS Lac, Mal
27	0	
28	0	
29	0	
30	1	Plaques in streak!
31	0	
"K"	3	⇒ not K-12 but W1113! Test on Lac↑

23 was inadvertently thrown out. Attempt to recover Lac+ S^S from cross plate.

11/4 W1369 0 / 2 plates heavily mix.
W1370 1 / 2 plates → Mal+. Of parents ff

Test 20 prototrophs from crossplate to DSM.

various sugars.

(Data Reorganized 7/16.

13x:

	Lac	Mtl	Xyl	Mal
1	−	−	−	−
2	−	−	−	−
3	−	−	−	−
4	−	−	−	−
5	+	−	−	−
6	+	−	−	−
7	−	−	−	−
8	−	−	−	−
9	−	−	−	−
10	−	+	+	+
11	−	−	−	+
12	−	+	+	−
13	+	−	−	−
14	−	−	−	+
15	−	+	+	−
16	+	−	+	+
17	−	+	−	−
18	−	−	−	−
19	+	−	−	−
20	+	−		

Pattern very similar to K12

Many unselected recombinations, undoubted

30 tested: all apparently $\lambda^- \lambda^R$. Rare tiny plaques may be cont. Reisolate from most suspicious.

26x directly to EMS: Lac, Mal.
17 ~~tested~~: all ~~M~~ Mal−
16 Lac− 1 Lac+.

6 tested.
1 Lac+ } λ^R
1 Lac− }
4 Lac− } λ^+

15x } See protocol } differs from 15 as T2,4,7 Sens.
30x } " " 30 as λ^S

26x 10 completely tested:

	Lac	λ	1113	~~T1~~	~~T2~~	T4	T5	T6	T7
1	+	−	S			S	S	S	S
2	−	+	S			S	↓	↓	↓
3	−	+	S			S			
4	−	+	S			S			
5	−	+	S			S			
6	−	+	S			S			
7	−	+	S			S			
8	−	−	S			S			
9	−	+	S			S			
10	−	+	S			S	R		
11 ~~[illegible]~~	~~#~~ −	+	S			S	S		
12 ~~[illegible]~~	~~#~~ −	−	S			S	↓		

Parents
*W1177 T1,T5^R; W1113^S
20 R each phage and W1113
λ−

W1373-74 crosses:

W1373 x W1177 (=#13) 20 prototrophs tested:

	count	Lac	Mal	Mtl	Xyl	λ
	10	−	−	−	−	R
	4	−	+	+	+	R
	6	+	−	−	−	R
parents	W1373	+	+	+	+	R
parents	W1177	−	−	−	−	+

W1374 x W1177 12 tested

					λ	T4,6,7	T5	W1113
	1	+	−		R	S	S	S
	7	−	−		+	S	S	S
	1	−	−		+	S	R	S
	3	−	−		R	S	S	S
	W1177	−	−	−	−	+	S	R	S
	W1373	+	+	+	+	R	R	R	R

W1375 x #15 1 prototroph T2, T4, T7 sens.

W1376 x #30. 1 " λ S.

Confirm possible recombinants:

a) Check protolysis of #'s. 1, 8, 11, 12

b) Compare parent and offspring with respect to:

2	39	:	Xyl	sl. different
4	36		"	almost identical
13-16	43		T4 — T6	Diff x T4
19	50		T6	Identical

#39 (W-1400) and #43 (W-1401) especially probably are recombining with W-1177. ~~#~~ 776-36 and W-136 (776-50) very probably are not. W1576 (#30) gave equivocal result.
34, 42, and 46 need to be reexamined.

Backcrosses to K-12 ($x^+ x s^R$)

October 27, 1950.

A. 58-161 × W1177

B K-12 × W1177

C W1302 × W677 → prototroph. pure Lac- on EMS test!

W1302 → Lac-! not as recorded!

Grow cultures 24h. in YZ tubes. 0.5 ml each parent / 10 ml. YZ addnl. 30h. Washand plate on EMS lac SM or EMS lac SM + BM or TLB.

Preliminary (control of 776)

	+	−	
B (on EMS lac SM).	179	52	Same – probably miscored 3
	178	70	
" + BM	56	40	[many minute colonies not scored 3-

10/27-28.

is missing!

Plates marked 774A on BM EMS-lac-SM:

+	−	
23	70	Numerous small colonies not scored. Probably −.
16	122	
27	108.	

must be repeated!

K-12 Outcross: W-1325 x W-1113

October 22, 1950.

W-1325 x W-1155 on D(0).

a. Grown together: no yield

b. Grown separately. Ca. 10^8/pl each.

10/27 b. 1-2/plate. Mostly small colonies. Pick and restreak on D(0). Pick and restreak on EMB Lac. Separate Lac- and +:

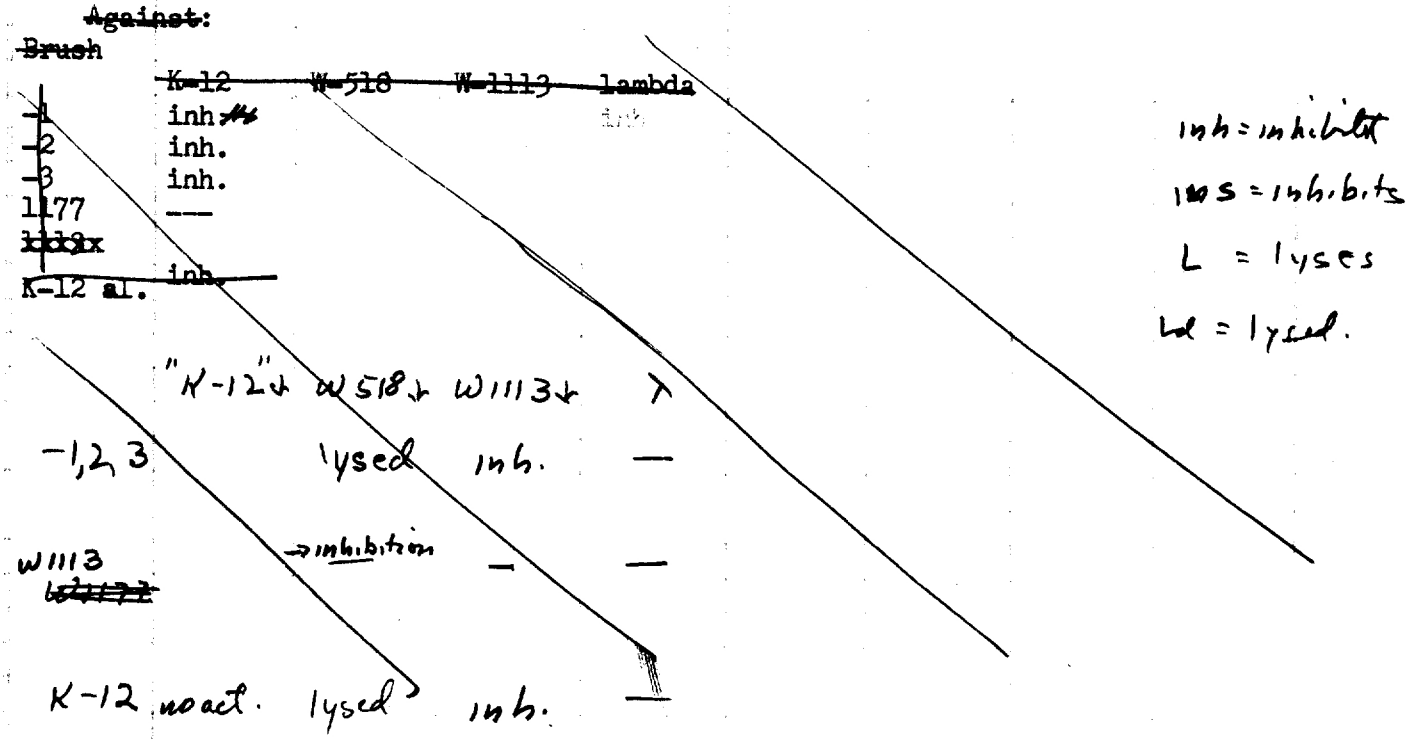
Lac- : 1-4, 6-10, 15. Lac+ : 11-14; 16-18; 5. [10- : 8 +]

Tests for Mal, Suc, colicin.

Lac- : all Suc-; Mal- except #3 Mal+; Lac+ : all Suc+ (varying); Mal+

All Lac- appear to be inhibited by K-12.

10/31 Recheck colicin and lysogenicity by cross-streak



"K-12" suspension must be mislabled. Repeat tests from slants.
✓ "K12" — Sucrose +. Confusion due to erroneous substitution of W1113 (?) for K12. Ignore above. Repeat with verified strains.

W1113 crosses

11/2/50.

~~Retest #1 and #12 = A, B. by backcross.~~

~~A = Lac− Col^s +~~

~~B = Lac+ Col^R~~

~~New crosses~~

~~[773-A W1325 x 1155 B W1155 x W677]~~

~~C [773-A x W1177] Very high yield~~

~~D [773-B x W1177] yield poor. All Lac −~~

A W1325 x W1155. Many tiny colonies. Lac+ most prominent.

B. W677 x W1155 High yield, Lac+ and −. Purify.

11/9: B: 20 + and 20 − prototrophs purified and picked to sucrose.

Lac+ : 20 S+ } cf. Mal, Colicin reactions.

Lac− : 19 Su − }

~~1 Su+~~ → check: mixture of Lac+ Su+ / Lac− Su−. e.g.

Test further on EMB Mal, Xyl: all Lac+ are Su+ Xyl+ Mal+ / Lac− are Su− Xyl− Mal−

Thus, shows no sign of recombination.

~~Test ϕ reactions: T5/8, T3, T4, T6, T7. T5:~~

~~Lac+~~

~~Lac~~

A. Ca 100 addnl. Lac+ tested: all Sucr +. No Lac − found

Test on Mal, T/8, T7.

11/2/50.

A	SR-16)	×	1177
B	K-12	×	1177
C	W1367	×	Y10
D	W1367	×	K12
E	W1368 BMSR	×	~~W814~~ W677 TLB, lac

=Y875R

Broth: 1ml each parent

11/4. A. EMS lac SM: 2+ : 3 −

SM+ BM: 7+ : 21 − many small, unscoreable
20+ : 44 − " " at this time
11+ : 43 − ...

B. SM 1+ : 3 −

C. SM ca = on a smeared plate
42+ : 35 −

SM + TLB, 64+ : 135 − many small

[Pick small − to EMB lac for isolation of TL Lac −.]

D. (SM) ~~12+ : 0 −~~ 13+ : 12 −

E lac SM
lac SM + BM (ever !!) turbid! 3+ : 1 − (2 plates)

See 784

Streak out 776-23 cross.

11/7.../50

streak out background of original 776-23 crossplate

Pick, single colonies and test on var sugars.

Lac "S" s selections

Lac	Mal	Xgl	L	M	X
+	+	+	−	−	+
+	+	+	−	±	+
−	−	+	±	−	+
±	−	+	−	−	+
±	−	+	+	+	+
−	−	−	+	+	+
+	+	+	++	++	+

L	M	X
		all+

L	M	X	L	M	X	L	M	X
all+	all+	all+	all+	all+	all+	all+	all+	all+

presumably parentals.

Tests on putative recombinants

11/10/50.

Purified.

Prototroph

	W1177 × e30	Lac	Mal	Concl.	Lac	Mal	Mtl	Xyl	λ	T4	T5	T6	T7	Type.
1	1376	−	−		−	−	−	−	all R	S	R	Sp	S	1177 Rec.
2	39	+	+		+	+	+	±		R	R	Sp	R	Xyl dif?
3	36	+	+	—	+	+	+			R	R	R	R	Par.
4	36	+	+		+	+	+	±		R	R	R	R	Xyl dif.
5	32	+	+	—	+	+	+	−		R	R	R	R	Par
6	32	+	+	—	+	+	+	−		R	R	R	R	
7	32	+	+	—	+	+	+	−		R	R	R	R	
8	32	−	−		−	−	−	−		S	R	S	S	1177.
9	33	+	+	—	+	+	+	+		R	R	R	R	Par
10	33	+	+	—	+	+	+	+		R	R	R	R	
11	33	−	−		−	−	−	−		S	R	S	S	1177
12	33	−	−		−	−	−	−		S	R	S	S	1177
13	[illegible]	+			+	+	+	+		Sp	R	S	R	T4 X Rec. T6
14	43	+			+	+	+	+		Sp	R	S	R	
15	43	+			+	+	+	+		Sp	R	Sp	R	
16	43	+	+		+	+	+	+		Rp	R	Sp	R	
~~17~~	~~47~~	+	~~−~~	—	−	+	+	+		R	R	R	R	Par
~~18~~	~~47~~	+	~~−~~	—	−	+	+	+		R	R	Rp	R	
17 ~~19~~	~~48~~	+	+		+	+	+	−		R	R	S	R	✓T6
18 ~~20~~	~~48~~	−	+											
19 ~~21~~	50	+	+											

? 776:32 fertile F+ (149 mal+, 50 mal−)

EMB negr
negr

Putative for ...
EMB Mal

Test on Xyl, Mtl, λ, T4 5 6 7

Par → W1376, 39, 36, 32, 33, 43, 48, 50; 1362a; b.

	Lac	Mal	Mtl	Xyl	λ	T4	T5	T6	T7
W1376	+	+	+	+	all R	R	R	Rp	R
39	+	+	+	+		R	R	Sp	R
36	+	+	+	+		R	R	R	R
32	+	+	+	—		R	R	R	R
33	+	+	+	+		R	R	R	R
43	+	+	+	+		R	R	R	R
48	−	+	+	±		R	R	R	R
50	+	+	+	±		R	R	R	R
1362a	+	+	+	+		R	S	S	R
1362b.	++	+	+	+		R	R	R	R
other data: 30	+	+	+	+		R	R	R	R
1177 ~~48 par.~~	—	—	—	—		S	R	S	S

776:32 = Wg 39

~~See over~~

39 # is a strong Xgl+; 39 x is weaker, and may thicker occ. —

36 # is stronger than 36 x, but not markedly.

Recombinate for 39 x

#19 indistinguishable from 776-50.

	T4	T6	
# 13	S^P	S	clearly different from parent in T4 reaction. Recombination very likely.
14	S^P	S^P	
(15)	R	R^P	
16	S	S	
776-43	R	S^P	

mm coli crosses

		Suer	Rx W578	Prototr.	xW1177		Recomb Count.	
W1377	23	—	—	—	+ dense sprinkling, tip colonies in loon dilution			
W1398	32	—	—	+	+ 0,0 4sm.	4	—	see ←
W1399	33	±	—	+	+ 1sm 2	3	—	
W1395	34	±	—	—	+ 3,100	100	.	
	35	+	—	+	+ ~~100~~ 0,0	0	—	
	36	—	±antag.	—	+ 0,0	0	—	
	37	+mue.	—	++	+		—	
	38	—	++antag.	—	+ 0	0	—	
↳ W1400	39	—	±ant?	—	+ 0 1	1	?	
	40	—	—	—	— +mir n.g. Repeat: 0,00✓	—	—	
	41	—	++ant.	+	+ 0 0	0	—	
W1396	42	—	± "	±	+ cairo L+ 100	100	21 Lac+ : all Mal+. ?	
W1401	43	—	± "	—	+ 2 2	2	?	
	44	++	—	—	— 0 0	0	—	
	45	+±	—	—	+ 0 0	0	—	
W1397	46a.	+	—	+	~~+~~ 300 L+,0	300	?	
	46b = 47	—	—	—	...		—	
	K				200 L+,−	200	?	
W1375				same slow	0,0,0,0,0			8 plates each ½ DSM ½ EMS lac S/4
1376				note #44.	0,0,0,0,0,0,0,0,0,0		1?, 0	

47	M/	46b	Lac−	0 0 —
48	1/	ML		0, ~~1~~ 1 —
49	2/2	C1		0 0 2 —
50		C2		0 0 0 1 —

11/9/50. Streakout colonies from lacs - yielding ~~parents~~ crosses.

Results: high yielders: Repeat crosses

34 Lac+ Mal− ? →
42 All Lac+ Mal+
46

High yield: 23, 34, 42, 46
low yield: 32, 33, 39, 43, W1376. } give w- numbers.

11/12/50

"W1377", at first regarded as S^s, shows anamalous responses:

Cross-streak with SM 20,000 u. on 15

On EMB lac: W1377 and other isolates react as S^s
EMS lac " " " " " " " S^R to 20,000 u but S^+ to 100,000 u

On D(0) W1377 is S^1 other isolates also grow poorly. grows poorly on D(0).

∴ W1377 is not suitable for crosses owing to partial resistance. However, it seems very likely to be crossable with K-12. Sprinkling of colonies on DSM is due to growth of prototroph mutants (rather mutants which grow on D(0) as well as on EMS lac). Initial appearance of 776-23 plate suggests that W1377 is similar to original stock.

Restreak original plate on EMS lac and examine for S^s prototrophs

Test W1377 on EMS lac: SM (100 – 1000 u/ml).

On 1000 u/ W1377 gives only scattered colonies; on 100 u (EMS) turbid growth.

In 40 tests, one mated S^s to 20,000 u/ml loopful streaked on EMS lac. Hold as W1377A. Recheck & compare with W1377.

11/12/50. Summary of Outcross Experiments.

Doubtful Crosses. xW1177

763. W1113. (Known to cross with K-12, using biochemical mutants).

A. No yield, dilute culture on DSM.
B. " " conc. " " ".
C. " " " ".

Date	No.			Succ. + Cellobiose	antag 578 washed	after 24h. (c.?)	S	Prototrophy		Control	x+
11/17/50.	51	B/6		−	±	−		+	~~pap~~		0 0
	52X			++[m]	−	−	R	+			−SM T.
	53		±SM	−	−	+	S	−			+SM 0
	54			+	+[m]	−	S	+			0
	55X			++	−	−	R	+			
	56			−	−	+ φ?	S	+			0 0
	57			++[m]	±[m]	−	S	+			1+[m] 0
	58X			++	+[m]	−	R	+			
	59		no SM	− P?	−	−	P	~~+~~ −		T	T T
	60			− P	−	−	S	+			T
	61		±SM	−	−	++	S	~~+~~ −	pap	−SM T	±SM 0 T
	62		±SM	−	−	+	S	−	++	−SM T	±SM 1+ ±SM T
	63		±SM	−	−	−	S	−	++	−SM T T	+SM 0 0
	64		±SM	−	−	−	S	−	−	±SM +SM 100+	−SM T, 100+ Turbid +, −
	65			±	±	Lac MP?	S	+	++(spr.)		MalSM: −−

56 maybe φ. Streak out lysed area on W578. ⟶ only antag.

Streak out # 59, 60 on EMB Succ.

58 maybe suitable Succ + Cellobiose + SAVE. Also SAVE 53, 56, 61, 62 as colicidal.

No promising cultures

Check 65 on Mal; retest crossability.

66 W1442
67 1443
68 1444
69 1445

SUMMARY (also see 791 ff.)

W1377. S^P: results of DSM crosses confused, but ferm. recombinants found.

1378 Ferm. Rec. ✓ x^+S^R all λ^R

1374 " " ✓ " Many λ^R; λ^+

1395
1396 } Mostly Lac+ Mal+. High yields

1397 Lac+, −.

1115 DSM; low yield. Nutr. Very low yield (colicin), but rare ferm. rec. were found. Both parental combinations seen. See 763e.

Confirm W1395-6-7 and W1377 ×

W1377. Partially resistant to streptomycin. Pick 8 colonies ? V+ V−. EMS Mal sm.

W1395. c. 0 colonies
× >300 / plate. All apparently Lac+ $T1^R$ ... (parental) sister +.

W1396 c. 0
×. >300 /plate All+ on EMS Mal sm ; Lac sm.

W1397 c 0
× >500/plate. All EMS Mal sm + ?
Lac +, and −

W1377A
× Ca. 6-10/plate Lac+. Transfer to EMS Mal sm

From Hosp. Municulture	Sucrose	Colicin on W518	Comment	Colicin
70	+	−	2 lac+ mucoid	++ weak
71	−	+		−
72	−	−		−
73	−	±		−
74	+	−		−
75	+	−	1 Lac+	+
76	−	−		−
77	++	−		−
78	−	++		−
79	++	−		±m
80	+	−		−
81	−	±	Lac−	−
82	−	+		±

No protoplasts S^R.

~~83~~ ~~84~~ ~~85~~ ~~86~~ ~~87~~ ~~88~~ ~~89~~ ~~90~~ ~~91~~ ~~92~~ ~~93~~ ~~94~~ ~~95~~

70-82
All Mal+ $S^S X^+$

66	−		0, 2 Mal+
67	−		0, 0
68	++		1, 1, 0, 0 (Mal+)
69	−		0, 0, 0

Er. carotovora 83				0	
Er. amylovora 84				0	
W1281 85	−	hypogene		0	−
86	+	± color		0	−
87	+	± color		0	−
89	+	−	mucoid S^R	do not use.	−
89	−	−±		0	−
90	+	−	Ca 20 Mal+ ; ~~*~~ mucoid+ non-mucoid.		
91	−	± color		0	−
92	−	±		0	−
(93)	−	−		3 Mal+	−
94	+	−		0	−
(95)	+	++ col.		1 Mal−	±

90: parent: non-mucoid lac+Mal+ : ↘ : mucoid + non-mucoid
93 " lac+ ; ↘ Mal+ (plaques?)
95 par : Mal+ ; ↘ Mal−
103 parents Mal+ and − ; Lac+ ; ↘ "Mal−" lac+
106 parent Mal −+ ; ↘ Mal−

YW1177

				Succ	Celb.
	96	FREDERICK CA7	0	−	−
	97	CA18	0	−	−
EMS Mal sm.	98	CA23	0	−	−
	99	CA31	dense sprinkling of Mal+ (abn. −?)	++	−
	100	CA38	0	±	−
	101	CA42	0	−	−
	102	CA46	0	±	−
	103	CA53	ca. 20 Mal−	±	−
	104	CA57	0	++	−
	105	CA58	0	−	−
	106	CA62	2 Mal−	−	−
	107	KL35	0	−	−
	108	C6	0	−	−
	109	W. PH Lab	109066 0 0		
	110	"	109067 0, 3+,		
	111	"	0, 0		
	112	"	Turbid! SR.		

12/14/50. Repeat: EMS Lac.

90		0	
93		0	1+, −, several+?
95			
103	M−	A few+ ?	0
106	M−		5-10 +, −
107		0	0

99c → many colonies, dimorphic on EMS Mal sm.
X " " " " ".

Conclusions:

106 is very likely crossable

90, 95, 93, 103, 110 should be rechecked.

Parents should be verified for coli in if relevant.

99 is partially SR & gives very frequent mutants.

Ck strains + Colicin actions

(FREDERICQ STRAINS).

12/18/50

Indicator →

Frederiq Ck.		W 518	W 1113	1373	1374	1377	1395	1396	1397	C 6
V	CA 7	+	−	+	±	−	−	±	−	+
B	" 18	+	−	+	±	−	−	±	−	+
D	" 23	+	+	+	+	−	+	+	−	+
A	01	+	−	±	−	+	+	−	+	+
E	38	+	−	+	−	−	−	+	−	+
F	Y2	+	−	+	−	−	−	+	−	+
G	Y6	+	−	±	±	−	−	−	−	+
I	53	+	−	±	−	−	−	−	−	+
C	57	−	−	+	±	+	+	−	−	±
H	58	+	−	±	−	−	−	−	−	+
I, J	62	+	−	+	−	−	−	+	−	+
K	K 235	+	−	+	−	−	−	+	−	+
W	1396	−	± ?	−		−				± ?
	W 1397	−		−		−				−

+ indicates colicin action; − indicates no action.

Colicins provide clear differentials between W6 - strains.
Colicidal action of W1396 is very weak, if any.

Note. CA53 and CA62 are both mixed in respect to Mal+ and −. However each component is Ck+ on W518. CA53 is Lac+ CA62 is Lac −.
CA62 Mal− is a weak fermenter. It gives Mal+ readily. Some have a radiating appearance, but non-stability Mal+ → ± detected.

12/23/50.

W1177×

Confirmations

		Suc	Colicin/578	Cellobiose	$\lambda^+ S^R$ on EMS lac sms
~~65~~ 110					~~0~~ 1 Lac+
66					1 Lac+
68					0
70					1 muc 2 nonmuc Lac+
75					2 muc + ?
90					0, ~~4~~
93					
95					2 v.sm. Lac − 1 Lac+
103					13 Lac −; 10 Lac −
106					3 Lac −
K12					ca 300 Lac+, −
109				−	
110				−	
111				−	
112				−	
113	110007	+	−	−	2 v. sm.
114	111171	−	+++	−	2 Lac+
115	110565 sp?	−	−	−	0
116	112774	−	−	−	8 Lac+
117	111552	−	++	−	0
118		+	± φ?	−	1 Lac+, 0
119		−	++	−	0
120		+	± φ?	−	ca 100 Lac+ var. cols
121		−	± φ?	−	ca 100 Lac+ sm. cols.
122		+	± φ?	−	0
123		−	∓	−	0 0
124		−	−	−	5 Lac+
125	mucoid Lac±	−	−	−	0 0
126	muc Lac±	+ muc	∓	+ muc	2 muc 1 muc
127	muc	~~[illegible]~~ + muc	−	~~#~~ + muc	
~~128~~					

Conclusions:

106: Mal− prototrophs. Mtl−. ∴ recombinants all λ− colicin −?

103: also gives Mal− ~~prototrophs~~. Lac −. ∴ 103 also interfertile

95: 1 Mal+ Lac+ ; prot, not prototrophic! ??
 2 Mal− Lac−

Recheck # 70, 90, 93, 95 ; 116; 120; 121; 124

PRESERVATION:

	1	2	3	4	5	6	7	8	9	10
	K-12	1113	1373	1374	W1377	W1395	W1396	W1397	W1494	1526A
	776-	3-Shapiro	13	26	23	34	42	46	(CA-62)	(CA-53)
Origin	Blair-Clifton Feces	Chick. F.	u	u	u	u	u	u		
Nutrition	+	+	+	+	± suc	± suc	± suc	± suc	+	+
F:	+	−	[+]	−(4)	−	+?	−	−	−	−
Lac	+ AG	+ AG	+ AG	+ AG	+ AG	+ AG	+ AG	+ AG	delayed −	+ AG
Mal	+	+	+	+	+	+	+	+	+	+
Xyl	+	+	+	+	+	+	+	+	+	+
Suc	−	+	−	−	−	+	−	+	−	+
Gal	+	+	+	+	+	+	+	+	+	+
M+l	+	+	+	+	+	+	+	+		
Stl										
Ara	+	+	+	+	+		+	+	+	+
Glu	+	+	+	+	+	+	+	+	+	+
Cello	−	−	−	−	−	−	−	−	−	−
Rhamn	+	+	+	+	+	+	+	+	±	±
O	R	77 17	8 8	25 25	− −	−	2	−	12	R
K										
H	not H1-33		−	−					−	−
Serifl.	R	S	S	RS		S	R	S	S	R
Edicin per succ.	all but C	+ O	S A±	C±G± VBD	SAC	S:ADC	S: VBDEFJK	S A	+IJ	+I
In	++	++	++	++	+	− ✓	++	+	++	++
MR										
VP										
Citrate	−	−	−	−	+	+	−	+	−	−
T1	S	R	R	R	R	R	R	R	R	S
2	S·P	S·P	R	R	R	R	R	R	R	R
3K	S	R	R	R	R	R	R	S masked	R	R
4	S	R	R ±	R ±	R	R	R	R	R	R
5	S	R	R	R	R	R	R	R	R	SR
6	S	R S	R	R	R	R	S masked	R	R	R
7	S	R	R	R	R	R	R	R	R	R
λ	+	R	R	R	R	R	R	R	R	R
R2	S	R	R	R	R	R	R	R	R	R
H370	S									
Valine	S		R	R	R	R	R	R		

probable infallible
967

WG	11	12	13	14	15	16	17	18	19	20
W-	1549 ✓	1550 ✓	1548 ✓	1584 ✓	1715 ✓	1716 ✓	1633 ✓	1718 ✓	1719	1720
776-	398	403	234	237	475	479	609	613	629	635
Origin	Sputum	F	BB45	(BB34)	Bohnhoff 68 HB-X Ray	Bohnhoff 72 Gut	T797-gallbl.	Lung	U	U
Nutrition	+	+	+	Proline	+	+	++			
F	+	+	−	+	−	+	+	−	−	−
Lac	+ AG	+ AG	+ AG	− P (ag)	+	+	+	+	[struck] −	+
Mal			+	+			+	+	+	+
Xyl										
Sdc			−	++	−	−	−	−	−	−
Gal			+	+	+	+				
MH										
SH										
Ara										
Glu										
Cello			−	−	−	−	−	−	+	−
Rhamn			+	+	+	+				
Acrifl. O	15				16	−			−	
K										
H	−				1,12	pool 1+3	−	−	H+ 7+1-33	7
	S	S?	R	R	AS	S	S	S	S	S
Colicin pr. (sens. 1092)			R	wg2-5	R	R Lysogenic	−	−	[struck] −	++
Valine										
Indole	++	++	++	++	++	++				
M.R.										
V.P.										
Citrate	−	−	−	(−)	−	−				
T1	R	R	R	R	R	R	R	P	R	P
T2	R	R	R	S	R	R	R	R	R	R
T3K	R	R	R	R	R	R	R	R	R	R
T4	R	R	R	R	R	R	R	R	R	R
T5	R	R	R	R	R	R	R	R	R	R
T6	R	[struck] SP	R	[struck] S	R	R	R	R	R	R
T7	S	R	R	RS	R	R	R	R	R	R
λ / λ2 / λ370	R	R	R R R	R R R	R R R	R R R	R R	R R	R R	R R

↓ 13 received from [illegible]

WG	21 ✓	22 ✓	23 ✓	24 ✓	25 ✓	26 ✓	27	28	29	30
W	1721	1722	1723	1710	1711	1712	1714	1258	1115	1762
776-	655	657	672	1051	1056	1081	1188	Cavalli NTCC 123	Shapiro	1286 Clifton K-130
	F	F	U	Inf. Diar	Inf. Diar	Inf Diarrh	U	Autotroph?? 28A = prototr.	Chick. F	[illegible]
		Cystineless								
F	+	−	−	−(−)	−	−	−	−−	−	−
Lac	+	+	+	+ unstab.	+	+	+	+	+	+
Mal	+	+	+	−	+	+	+	+	+	+
Xyl				−		+	+	+	+	
Suc	+	−	−	−	−	±	+	−	+	−
Gal										
Mtl										
Sbl										
Ara										
Glu				+	+					
Cello	−	−	−	−	−	−	−	−	−	−
Rham										
Acif.	S(?)	S	S			S		−		
O → H		++	H+	4		1	−			27
Cl	−	+++	−	−		→ 1082.	+++ K12 wg28			
T1	R	R	R	R	R	R	R	S	R	Few Plaques S
T2	R	R	R	R	R	R	R	S	R	R
T3K	R	R	R	R	R	R	R	S	R	S
T4	R	R	R	R	R	R	R	S ±	R	R
T5	R	R	R	R	R	R	R	S	R	masked
T6	R	R	S	R	R	S	R	S	R	R
T7	R	R	R	R	R	R	R	wg28 S S(±)	R	R
λ	R	R	R	R	R	R	R	S	R	RR masked
λ2	R	R	R	R	R	R	R	S	R	SR

WG 36 & 38 from same patient.

wg	31	32	33	34	35	36	37	38	39	40
W	1376	1754	1904	1905	1906	1913	1914	1916	1398	1917
776	30	1052	1542	1417	Waksman	1667	1696	1666	32	436
	U WPHL	Catlin	Catlin	Benham	Davis	Catlin	Catlin	Catlin	U WPHL	Benham (U)
F	−(+)		−	−	+		−+			
Lac	+		−	+	+	+	+	+	+	+
Mal	+		+	+	+	+	+	+	+	+
Xyl	+		+	+		+	−	+	−	+
Sac	−		−	−	±	+	−	±	−	−
Raf	+		+	−		+	+	+	+	+
MH										
Sal										
Ara										
Glu	+		+	−		+	+	+	+	+
Cello	±		−	−		−	−	−	−	−
Rh										
Ace										
O			21 ✓			9	4 ±18 4		4(18)	7+
K							3 2(0)		12	
H	−	±	4!	−			26(14) 5	−	+	H+ −

Cla complete

Lysog. K12

T1	R	R	R	S (P)	R	R	R	R	R	R
T2	R	SR	R	R	S	R	S	R	R	R
T3	R	R	R	R	R	R	R	R	R	R
T4	R	R	R	R	S	S sm. pl.	S±	R	R	R
T5	R	R	R	SR	R	R	R	R	R	R
T6	R	R	R	R	S	S	S	R	R	R
T7	R	R	R	R	R	R	R	R	R	R
λ										
λ2	R mosh	R	R	R	R	R	R	R	R	R

Wg	41	42	43	44	45	46	47	48	49	50
W	1925	1929	1959	1985	1986	1989	1799	1997	2005	1939
776	772	1688	1562	1301	1313	1214	1398	1415	1407	1763
	Benham (F)	Catlin	Catlin	Miller, U. Chi. (Mouse)		Benham (F)	Benham	Benham	Benham (wound)	NVUMS (Colwell) TR-

	41	42	43	44	45	46	47	48	49	50
F		−					− + EML			− [illegible]
Loc	+	+								+
mal	+	+								mar ST and +
Xyl	−									+
Suc	−	−								
Gal	+									+
Mtl										
Stl										
Arab										
Glu	+									
Cello	−	−								
Rh										

	41	42	43	44	45	46	47	48	49	50
O	77		group C, K/21		~~96~~ 77	76 ✓		81		
K	3?					−	3(23)	−		
H	pool 31-33	+ rough flare	4 / −	26(21)	H+	77 ✓	13	++ H pool 26-30 27	−	−

	41	42	43	44	45	46	47	48	49	50
T1	R	R	R	R	R	R	R	R	R	R
T2	R	R	S/R	R	SR	R	R	S(R)	R	S
T3	R	R	R	R	R	R	R	R	R	S
T4	R	R	R	R	R	R	R	R	R	S
T5	R	R	R	R	R	R (meshed S)	R	R	R	R
T6	R	S	R	R	R	R	R	R	R	S
T7	R	R	R	R	R	R meshed	R	R	R	R
λ2	R	R	R	R	R	R	S patchy	R	R	small plaques

wg5D appears a mixture of stable Mal+ and - !

(cf e.g. W1939a as recently received. Easily separated

Mal- appears stable; same for+ !)

but does give rare + papillae (see 1004)

WG	51	52	53	54	55	56	57	58	59	60
W	2049	1868	1870	1871	1875	2665	2691			
(776-)	122 = "C"	293	295	296	300	1854	1890			
	Weigle	Kauffmann	K.	K.	K.	Farmer. Ewing				
F	− + Bartani	− + Bynoe	− + var. Bynoe	− − Bynoe	− − Bynoe	− + AB	− + AB			
Lac	+	+	+	+	+	+	+			
Mal		+	+	+	+	+	+			
Xyl						+	+			
Sucr		−	−	−	+	−	+			
Gal						+	+			
MH						+	+			
SH										
Ara						+	+			
Glu						+	+			
Cello						−	−			
Rham		+	−	+	+					
Acr						S	S			
O		18	20	21	25	26	~~[illegible]~~ X			
K		−	17	20	19	B6	~~[illegible]~~ X			
H	−, +	14 +	~~[illegible]~~ +	− −	12	? − ✓	−			
Ch			O20 = Fla			−				
		✓	Orskov: mixed c WG52 + another	✓	Orskov: mixed c WG54		O25 H12 = wg55?			
T 1	S					R	R			
2	S					R	R			
3	S					R	R			
4	S±					R	R			
5	S					R	R			
6	S					R	R			
7	S±					R	R			
λ	S					R	R			
λ2	S					R	R			

12/27/50.

Retest: crosses on EMS lac sm. 2 plates each.

-65	V. numerous, mostly small colonies
66	0 0
68	0 0
70	0 1+
75	1+ more 1+ more.
90	0 0
93	1+ 1+
95	0 0
103	1+ 0
106	1−, 1− large 4− small
110.	0, 0.

very low yields! Purify on EMB lac + recheck.

all Mal−: ↓

65: parent culture is mixture of Mal− and Mal+. From sm, all Mal−. Reisolate from slant!

70:	Lac− Xyl−.	Control: Lac+ Xyl+	} auxotrophic!
75:	2 Lac− Xyl−	" Lac+ Xyl+.	
93	2 " "	" "	
103	1 " "	" "	
106	7 Lac− Xyl−	" Lac−" Xyl+.	

Test for prototrophy! 106: X+ S^R. Others did not grow on EMS lac SM. Repeat crosses:

106: Rather dilute plating: numerous colonies developing slowly with lac± appearance! When streaked, these are pure, rather strongly Lac−. After 48-72 hours, they developed a mottled appearance something like the EMS colonies.

65 test:

Separate Mal+ and Mal- components.

A: (Mal-) gave colonies, control as well as x1177, on EMS Lac sm.

B was infutile.

65 is considered not infutile.