10/20 ff/sd.

Strains used 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
10/20/ff 4	—		0	0
5	93940		0	0
6	9402Y	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	Suc+
15	1	Suc−, rather mucoid
16	0	
17	0 0	
18		
19		
20	0	
21	0	
22	0 0	
23	many colonies. coli??	
24	0	
25	0	
26	20 Suc+	= W1374 Pick to EMS Lac, Mal
27	0	
28	0	
29	0	
30	1	Plaques on 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 mainly mix.
W1370 1 / 2 plates → Mal+. Of parents ff

Test 20 prototrophs from rosoplate 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 recombinants, undoubted

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

26x dirtily to EMS: lac, Mal.
17 ~~tested~~: all ~~lac~~ Mal−
16 lac− 1 lac+.

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

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

26x 10 completely tested:

	lac	λ	1113	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			
11	−	+	S	S	R		
12	−	−	S	S	S		

Parents
#W1177 T1,T5^R; W1113^S
20 Reach 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	d. 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. ~~the~~ 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 ($X^+ \times S^R$)

October 27, 1950.

A. 58-161 × W1177

B K-12 × W1177

C W1302 × W677 → pure Lac-on EMB test! No yield.

W1302 → Lac-! not as recorded!

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

Preliminary (contd of 776)

	+	−	
B (on EMS Lac SM).	179	52	[same - probably misscored]
	178	70	
" + BM	56	40	[many minute colonies not scored].

10/27-28.

B missing!

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

+	−
23	70
16	122
27	108.

Numerous small colonies not scored. Probably −.

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 +:

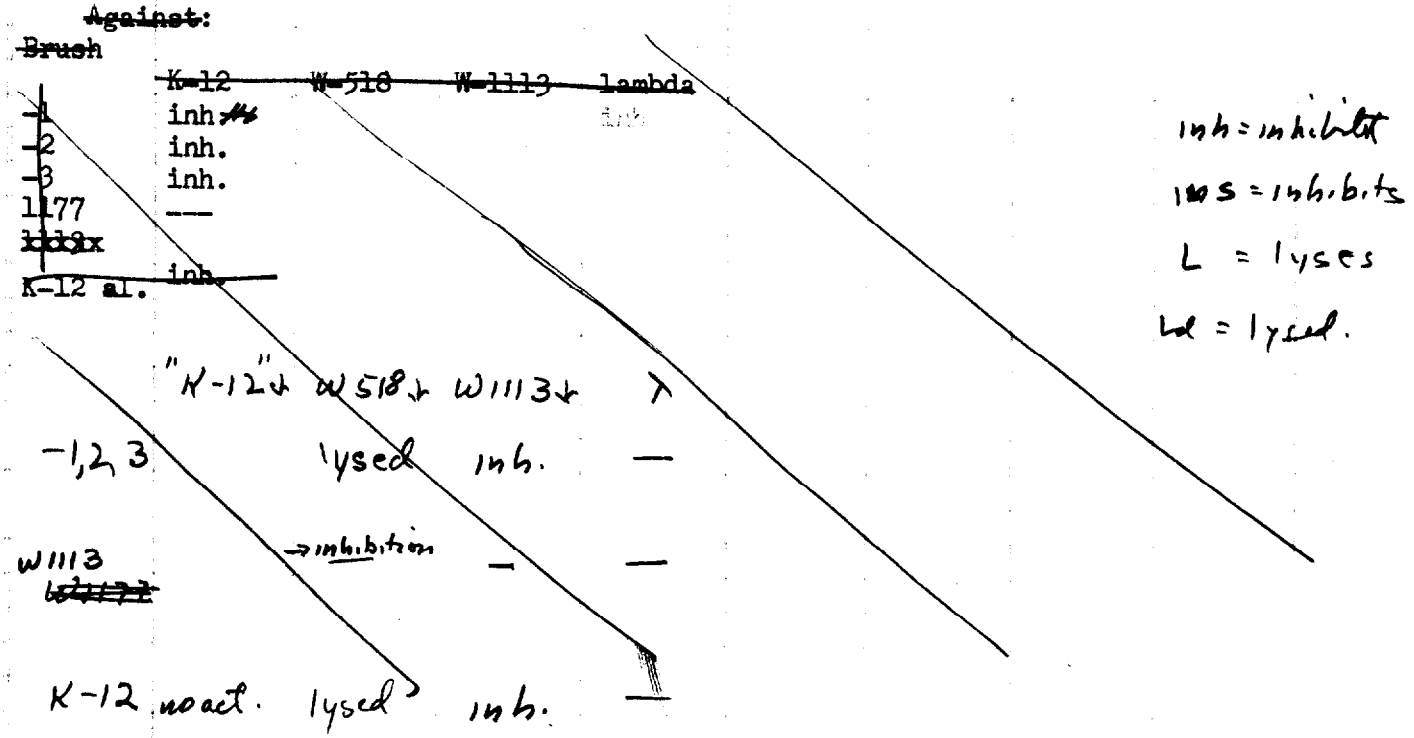
Lac- : 1-4, 6-10, 15. Lac+ : 11-14; 16-18; 5. [10- : 8 +]

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 mislabeled. Repeat tests from slants.
✓ "K12" — Sucrose +. Confusion due to erroneous substitution of W1113 (?) for K12. Degrade above. Repeat with verified strains.

W1113 crosses

11/2/50.

~~Retest #1 and #12 = A, B. by backcross.~~
~~A = Lac− Col^s λ+~~
~~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: 1518; T3, T4, T6, T7. T5:~~
~~Lac+~~
~~Lac−~~

A. Ca 100 addnl. Lac+ tested: all Sucr +. No Lac − found
Test on Mal, T5, T7.

11/2/50.

=Y875^R

A	58-161	×	1177
B	K-12	×	1177
C	W1367	×	Y10
D	W1367	×	K12
E	W1368 BMSR	×	~~W814~~ W677 TLB, lac

Inocula: 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 (error !!) turbid! 3+ : 1 — (2 plates)

See 784

streak out 776-23 cross. 776-23

11/7../50

streak out background of original 776-23 cross plate
Pick single colonies and test on var sugars.

lac	Mal	Xyl	L	M	X
−	−	−	−	−	−
+	+	+	−	−	+
+	+	+	−	±	+
−	−	+	±	−	+
±	−	+	−	−	+
±	−	+	+	+	+
−	−	−	+	+	+
+	+	+	++	++	+

Lac "" S
Lac − S
selection

L	M	X

all +

L	M	X
all +	all +	all +

L	M	X
all +	all +	all +

L	M	X
all +	all +	all +

presumably parentals.

Tests on putative recombinants

776q.

11/10/50.

Purified.

	W1177 × E30	Lac	Mal	Concl.	Lac	Mal	Mtl	Xyl	λ	T4	T5	T6	T7	Type.
1	1376	−	−		−	−	−	−		S	R	S_p	S	1177 Rec.
2	39	±	+		+	+	+	±		S	R	S_p	R	Xyl dif?
3	36	+	+	—	+	+	+	+		R	R	R	R	Par.
4	36	+	+		+	+	+	±		R	R	R	R	Xyl dif.
5	32	+	+	—	+	+	+	−		R	R	R	R	
6	32	+	+	—	+	+	+	−		R	R	R	R	Par
7	32	+	+	−	+	+	+	−		R	R	R	R	
8	32	−	−		−	−	−	−		S	R	S	S	1177.
9	33	+	+	—	+	+	+	+	all P	R	R	R	R	
10	33	+	+	—	+	+	+	+		R	R	R	R	Par
11	33	−	−		−	−	−	−		S	R	S	S	1177
12	33	−	−		−	−	−	−		S	R	S	S	1177
13	43	+			+	+	+	+		S^p	R	S	R	T4 X Rec.
14	43	+			+	+	+	+		S^p	R	S	R	T6
15	43	+			+	+	+	+		S^p	R	S^p	R	
16	43	+	+		+	+	+	+		R^p	R	S^p	R	
EMB negr	~~47~~	+		—	−	+	+	+		R	R	R	R	Par
negr	~~47~~	+		—	−	+	+	+		R	R	R	R	Par
17	~~48~~	+	+		+	+	+	−		R	R	S_p	R	✓T6
18	~~48~~	+	+											
19	50	+	+											

Probable Par

EMB Mal

Test on Xyl, Mtl, λ, T4 5 6 7

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

W1376	+	+	+	+	R	R	R_p	R
39	+	+	+	+	R	R	S_p	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

all P

776.32 = W1376 39

other data

30	+	+	+	+	R	R	R	R
1177	−	−	−	−	S	R	S	S

~~48 Par.~~

~~See note~~

39 ~~y~~ is a strong Xgl+; 39x is weaker, and may throw occ. –

36 ~~y~~ is stronger + than 36x, but not markedly.

Reisolate for 39x

#19 indistinguishable from 776-50.

	T4	T6
#13	S^P	S
14	S^P	S^P
(15)	R	R
16	S	S
776-43	R	S^P

} clearly different from parent in T4 reaction. Recombination very likely.

new coli crosses

		Sucr	Rx W578	Prototr.	xW1177		Recomb Cond.
W1377	23	—	—	—	+ dense sprinkling, zip. colonies in lower dilutions		
W1398	(32)	—	—	+	+ 0,0 4 sm.	4	—
W1399	33	±	—	+	+ 1 sm 2	3	—
W1395	34	±	—	—	+ 3,100	100	.
	35	+	—	+	+ ~~10~~ 0,0	0	—
	36	—	± antag.	—	+ 0,0	0	—
	37	+ muc.	—	++	+		—
	38	—	++ antag.	—	+ 0	0	—
W1400	39	—	± ant.	—	+ 0 1	1	?
	40	—	—	—	— + ann n.1 Repeat. 0,00	—	—
	41	—	++ ant.	+	+ 0 0	0	—
W1396	42	—	± "	±	+ ca 100 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					0,0,0,0,0		
1376					0,0,0,0,0,0,0,~~0,0~~,0,0	1?, 0	} 8 plates each ½ DSM ½ EMS lac S14.

same slow. note #44.

see →

47	M/L	46b Lac—	00	—
48	?	ML	0,1,1	—
49	C/2	C1	002	—
50		C2	0001	—

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

Results: high yielders: Repeat crosses

34 Lac+ Mal−? →
42 All Lac+ Mal+
46

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

11/12/50

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

Cross-streak with SM 20,000 u.

On EMB Lac: W1377 and other isolates react as S^s to 20,000 u (or 15) but S^+ to 100,000 u

EMS Lac " " " " " " S^R

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

∴ W1377 is not suitable for crosses owing to partial resistance. However, it seems very likely to be crossable with K-12. Spindling of colonies on DSM is due to growth of prototroph mutants (rather mutants which grow on D(o) 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. Restreak & 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. " " "

			Succ. + Cellob	antag 578 washed after 24h.	S	Prototrophy		Control	x+
11/17/50. 51	B/6		–	± –		+	~~pap~~		O O
52X			++^m	– –	R	+			–SM T.
									+SM O
53		±SM	–	– +	S	–			
54			+	+^m –	S	+			O
55X			++	– –	R	+			
56			–	– + φ?	S	+			O O
57			++^m	±^m –	S	+			1+^m O
58X			++	+^m –	R	+			
59		no SM	– P?	– –	P	~~+~~ –		T	T T
60			– P	– –	S	+			T
61		±SM	–	– ++	S	~~+~~ –	pap	–SM T	±SM O / –SM T
62		±SM	–	– +	S	–	++	–SM T	+SM 1+ / –SM O T
63		±SM	–	– –	S	–	++	–SM T T	+SM O O
64		±SM	–	– –	S	–	—	±SM / +SM 100+	–SM T, 100+ / Turbid +, –
65			±	± Lac MP?	S	+	++ (spr.)		Mal SM: – –

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

Streak out # 59, 60 on E MB 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.

1373 Ferm. Rec. ✓ x^+S^R all λ^R

1374 " " ✓ " Many λ^R; λ^+

1395 } Mostly Lac+ Mal+. High yields
1396

1397 Lac+, –.

1115 DSM: low yield. Nutr. Very low yield (colicin), but rare ferm. rec. were found. Both parental combinations seen! See 763[illegible].

Confirm W1395-6-7 and W1377 x

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

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

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

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

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

From Hosp. Hm cultures	Sucrose	colicin on W578	Comment	Cellobiose
70	+	−	2 lac+ mucoid	++ muc
71	−	+		−
72	−	−		−
73	−	±		−
74	+	−		−
75	+	−	1 Lac+	+
76	−	−		−
77	++	−		−
78	−	++		−
79	++	−		±m
80	+	−		−
81	−	±	Lac−	−
82	−	+		±

(70–81: ~~No~~ prototrophs S^R.)

~~83~~ ~~84~~ ~~85~~ ~~86~~ ~~87~~ ~~88~~ ~~89~~

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

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

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

(86–95: all prototrophs)

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

YW1177

				Succ	Celldr.
	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.P.H. Lab	109066	0	0
	110	"	109067	0	3+,
	111	"	~~[illegible]~~	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 colicin 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	C6
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.
Colicinal 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

		Sex	Colicin/578	Cellobiose	x^+S^R on EMS lac sm
~~65~~ 110					~~68~~ 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. cls
121		−	± φ?	−	ca 100 Lac+ sm. cls.
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
2 Mal- Lac- ; not prototroph ic! ??

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:	+	−	[+]	−(+)	−	+?	−	−	−	−
Lac	+ AG	+ AG	+ AG	+ AG	+ AG	+ AG	+ AG	+ delayed	−	+ AG
Mal	+	+	+	+	+	+	+	+	+	+
Xyl	+	+	+	+	+	+	+	+	+	+
Sac	−	+	−	−	−	+	−	+	−	±
Gal	+	+	+	+	+	+	+	+	+	+
M+E	+	+	+	+	+	+	+	+		
Stl										
Ara	+	+	+	+	+		+	+	+	+
Glu	+	+	+	+	+	+	+	+	+	+
Cello	−	−	−	−	−	−	−	−	−	−
Rhamn	+	+	+	+	+	+	+	+	±	±
O	R	77 17	8 8	25 25	− −	−	2	−	12	R
K										
H	not H-33		−	−					−	−
reiffl.	R	S	S	RS		S	R	S	S	R
Colicin pr		+							+15	+I
Colicin sus.	all but C	0	S A±	c±G± VBD	SAC	S ADC	S: VBDEFSK	S A	*	
Mn	++	++	++	++	+	− ✓	++	+	++	++
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 masked	R	R
3K	S	R	R	R	R	R	R	S masked	R	S
4	S	R	R ±	R ±	R	R	R	R	R	R
5	S	R	R	R	R masked	R	R	R	R	SR
6	S	R S	R	R	R	R	smashed	R	R	R
7	S	R	R	R	R	R	R	R	R	R
λ	+	R	R	R	R	R	R	R	R	R
λ2	S	R	R	R	R	R	R	R	R	R
λ370	S									
Valine	S		R	R	R	R	R	R		

probable infertile

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)	+	+	+	+	−	+
Mal			+	+			+	+	+	+
Xyl										
Sdc			−	++	−	−	−	−	−	−
Gal			+	+	+	+				
MH										
SH										
Ara										
Glu										
Cello			−	−	−	−	−	−	+	−
Rhamn			+	+	+	+				
Acrifl.										
O	15				16	−			−	
K										
H	—				1,12	pool 1+3	−	−	H+ pool 1-33	7
	S	S?	R	R	AS	S	S	S	S	S
Colicin pr. Sens. 1092			R	wg2-S	R	R Lysogenic	−	−	−	++
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	SP	R	S	R	R	R	R	R	R
T7	S	R	R	RS	R	R	R	R	R	R
λ			R	R	R	R	R	R	R	R
λ2	R	R	R	R	R	R	R	R	R	R
λ370			R	R	R	R				

↓ 13 recd [illegible]

WG	21 ✓	22 ✓	23 ✓	24 ✓	25 ✓	26 ✓	27	28	29	30
W	1721	1722	1723	1710	1711	1712	1714	1258	1115	1762
776-	665	657	672	1051	1056	1081	1188	Cavalli NTCC 123	Shapiro	1286 Clifton K-130
	F	F	U	Inf. Diar	Inf. Diar	Inf Diarrh	U	Auxotroph?? 28A = prototr.	Chick. F	
		Cystineless								
F	+	−	−	(−)	−	−	−	− −	−	−
Lac	+	+	+	+ unstab.	+	+	+	+	+	+
Mal	+	+	+	−	+	+	+	+	+	+
Xyl				−		+	+	+	+	
Sucr	+	−	−	−	−	±	+	−	+	−
Gal										
Mtl										
Sorb										
Ara										
Glu				+	+					
Cello	−	−	−	−	−	−	−	−	−	−
Rham										
Acif.	S (R?)	S	S			S		−		
O / H		H+	H+	4		1	−			27
Cls	−	+++	−	−		→ 1082.	+++ K12 w28			
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	R
T7	R	R	R	R	R	R	R	w28 S, S (A ±)	R	R
λ	R	R	R	R	R	R	R	S	R	R P
λ2	R	R	R	R	R	R	R	S	R	SR masked

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	+		+	+		+	−	+	−	+
Suc	−		−	−	±	+	−	±	−	−
Gal	+		+	−		+	+	+	+	+
MH										
Sal										
Ara										
Glu	+		+	−		+	+	+	+	+
Cello	±		−	−		−	−	−	−	−
Rh										
Ace										
O			21 ✓			9	4 ±18 4		4(18)	7+
K							3 12		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	S	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-
F		–					– + EML			– I
Loc	+	+								+
mal	+	+								mar ST and +
Xyl	–									+
Suc	–	–								
Gal	+									+
Mtl										
Stl										
Arab										
Slu	+									
Cello	–	–								
Rh										
O	77		group C, A/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	–	–
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
λ / 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	1588	1570	1571	1575	2665	2691			
(776-)	[illegible] 122 = "C"	293	295	296	300	1854	1890			
	Weigle	Kauffmann	K.	K.	K.	Fauco. Ewing				
F	− + Butoni	− + Byers	− + var. Byers	− − Byers	− − Byers	− + 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			020 = Fla			−				
		✓	Orskov: mixed c WG52 + another	✓	Orskov: mixed c WG54		O25 H12 = wg55?			

	51	56	57
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 sens.

B was infutile.

65 is considered not infutile.

776 — mutants available

WG 3.

W1421 - 1429.

1421 Cys
1423 IV
1425 Tyr
1427 Tr or Tyr
1429 Hist

1448 IV → Leu (only!) W1450. → Hist W1451

1449 Leu

1448 Cys IV → 1473-75 Mal-

WG 4 1430 - 1434

1430 Leuc → 1446 Try 1447 Pro
1431 Prol
1441 Prol →

Try 1454 Meth 1455 1456 Arg 1457 Cys
Leu 1458 IV 1459

1446 Leu Try → 1460 - 1466 Lac- (mel Glu-) → 1464 Mal-Lac-Leu Try (1482-84)

1454 Prol Try → 1476-81 Lac-

SR (SRP tester)
W1611

Reacts as F+ but does not transmit unless infected.

WG-7 W1396.

1495 Cys ⟶ 1998 Cyst. Pool, 1987 Cyst. typ.
1496 Isol
1497 IV
1498 Leu

WG 9 CA62 Lac –

1504 Pro or Tyr !
1505 Tyr
1506 Pro
1507 Hist or Pro.

WG 10 W1526A

~~math~~ W1877 math
~~hist~~ 1878 hist
W2022 hist
W2023 lys.
W2024 lysine → W2025 lysine + ?

W. K. Thomsen.

Induction and isolation of biochemical mutants

Mutants were isolated from stock cultures of ~~W1715~~ (WG 10) and W1715 (WG 15) of E. coli ~~strain K-12.~~ Cultures were grown in complete medium without either aeration or subsequent irradiation. Washed cells were incubated in minimal medium, to which various amounts of penicillin (100, 150 and 300 units per ml respectively) were added.

By using the replica plating technique, mutants were isolated in 4 experiments.

Experiment	Stock	Biochemical mutants
1.	WG 10	A - histidineless B - isoleucine-valineless C - methionineless. D - lysineless
2.	WG 10	E - isoleucine-valineless F - lysineless G - histidineless H - lysineless
3.	WG 15	1 - 32 all prolineless
4.	WG 10 lysineless (mutant F)	FLX - diauxotroph Lysineless and unknown factor

Subsequent testing indicated that the following were stable mutants. Others were discarded as repeated isolates of the same mutation or for other reasons.

1 A_2 - histidineless
2 B_2 - isoleucine-valineless
3 D_2 - lysineless
4 E - isoleucine-valineless
5 F - lysineless
6 H - lysineless
24 - prolineless (WG 15)
7 FLX - diauxotroph lysineless + unknown factor.

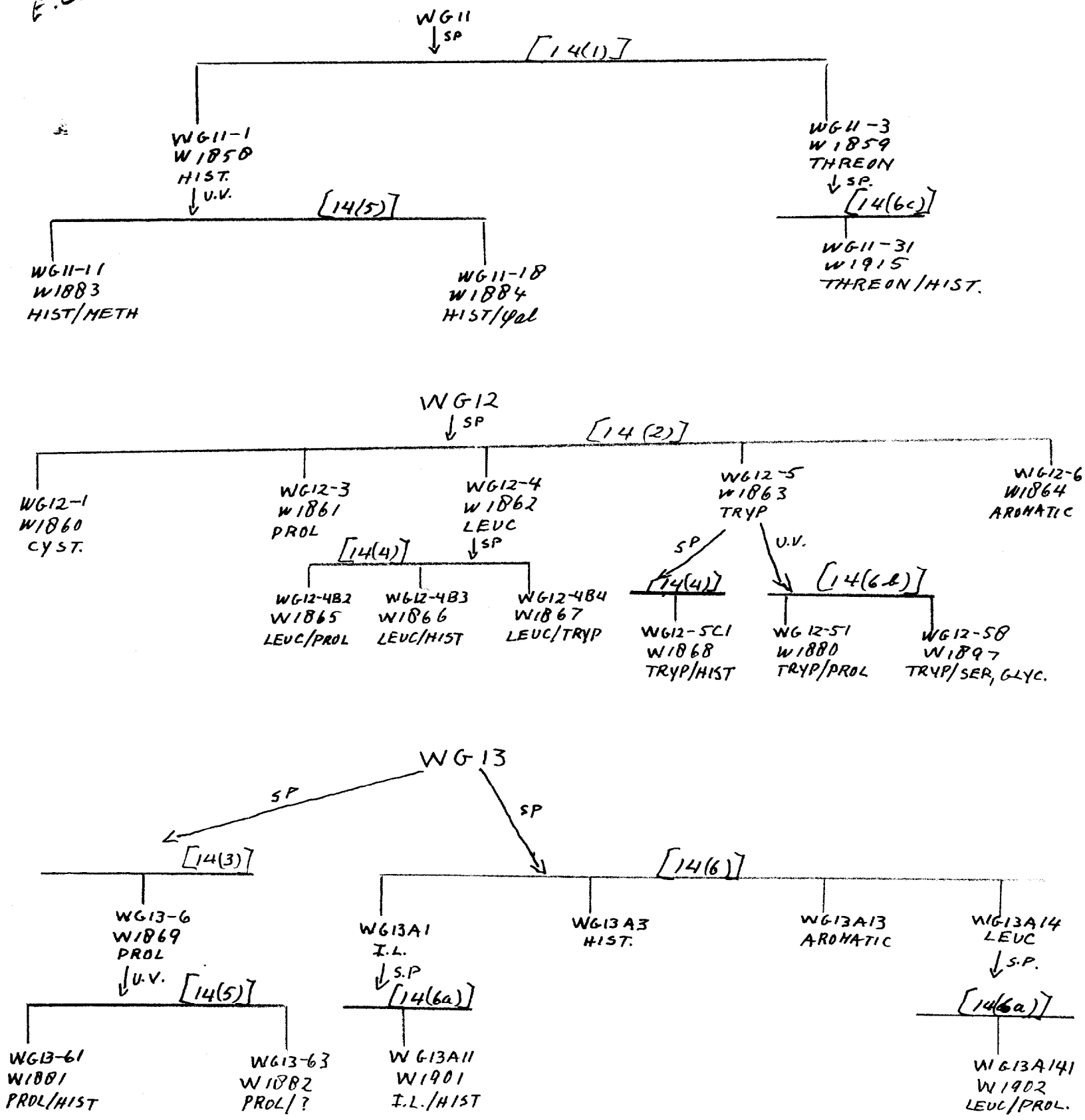
WG Mutants and Crosses

A description of all WG mutants made will be found on a seperate sheet. The first number given the mutant is the one under which the mutant can be found in my notebook; the second number given is the W number. The chart indicates which mutants were obtained in the same experiment and the number in parentheses indicates the experiment number in my notebook. All mutants were selected by the penicillin method. Sp indicates that the mutants selected had arisen spontaneously; U.V. indicates that mutants were induced by means of ultraviolet light. Four seperate attempts to put a marker other than histidineless or prolineless on W1895 ? failed.

The following crosses were made between WG strains:

Strain	WGs Crossed	Mutants used	Colonies/Plate
WG11	11 x 13	see under WG13	
WG12	12 x 12	1865 x 1868	ca 10
	12 x K12	1868 x 58-161	ca 50
		1868 x 1177	ca 30
	12 x 3	1865 x 1448	0, 2
		1868 x 1448	ca 5
	12 x 4	1868 x 1445	1, 2
	12 x 13	see under WG13	
WG13	13 x 13	1901 x 1902	1 to 6
	13 x 12	1902 x 1868	ca 200
	13 x K12	1902 x 811	6 to 10
	13 x 11	1902 x 1883	2, 0, 0
		1902 x 1915	1, 0, 0
		1902 x 1884	2, 0, 3
		1882 x 1883	1, 0, 0
		1882 x 1915	0, 0, 0
		1882 x 1884	0, 0, 0

E.C.


WG11
SP
[14(1)]
WG11-1
W1858
HIST.
U.V.
[14(5)]
WG11-11
W1883
HIST/METH
WG11-18
W1884
HIST/gal
WG11-3
W1859
THREON
SP.
[14(6c)]
WG11-31
W1915
THREON/HIST.
WG12
SP
[14(2)]
WG12-1
W1860
CYST.
WG12-3
W1861
PROL
WG12-4
W1862
LEUC
SP
[14(4)]
WG12-4B2
W1865
LEUC/PROL
WG12-4B3
W1866
LEUC/HIST
WG12-4B4
W1867
LEUC/TRYP
WG12-5
W1863
TRYP
SP
[14(4)]
WG12-5C1
W1868
TRYP/HIST
U.V.
[14(6a)]
WG12-51
W1880
TRYP/PROL
WG12-58
W1897
TRYP/SER, GLYC.
WG12-6
W1864
AROMATIC
WG13
SP
[14(3)]
WG13-6
W1869
PROL
U.V.
[14(5)]
WG13-61
W1881
PROL/HIST
WG13-63
W1882
PROL/?
SP
[14(6)]
WG13A1
I.L.
S.P
[14(6a)]
WG13A11
W1901
I.L./HIST
WG13A3
HIST.
WG13A13
AROMATIC
WG13A14
LEUC
S.P.
[14(6a)]
WG13A141
W1902
LEUC/PROL.

Wg 15 (W1715)

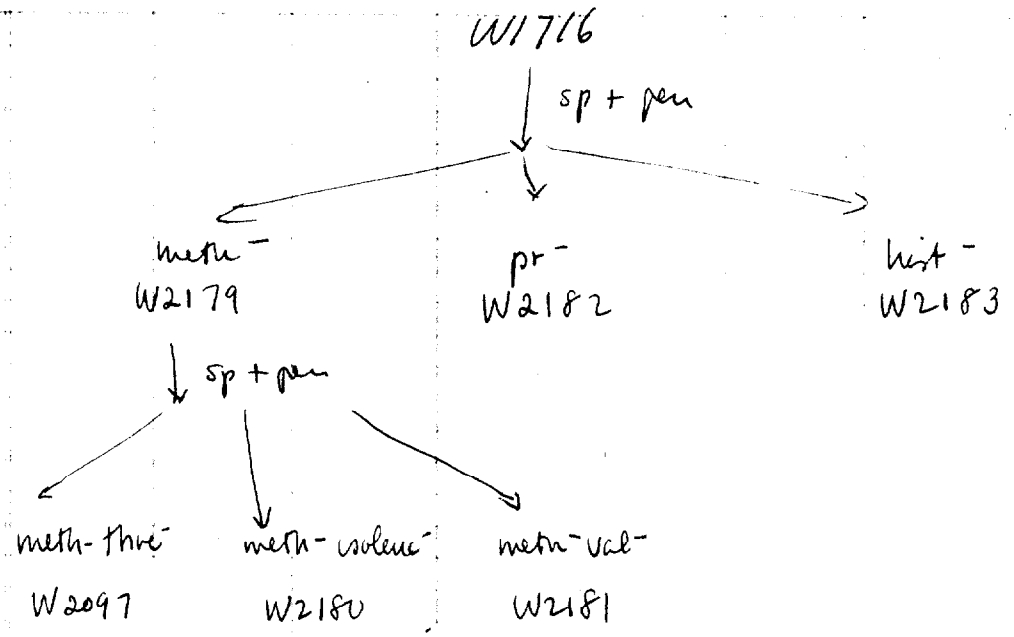
↓

W2026 protein

Wg 16

Mons

p. 160 and ben



Wg 24

PASkaa 3-12-1

↓ spont. + pen.

W2264 (trypto⁻) —spont. + pen.→ W2267 (trypto⁻ : hist⁻)

W2265 (arg⁻) → W2268 (arg⁻ : Ile⁻)

W2266 (hist⁻) → W2269 (hist⁻ : Leu⁻)

Wg 26

PDSkaar 3-12-1

↓ sporul + pen

W2270 (Leuc⁻) —sporul + pen→ W2273 (Leuc⁻ : Hist⁻)

W2271 (IU⁻) → W2274 (IU⁻ : Ang⁻)

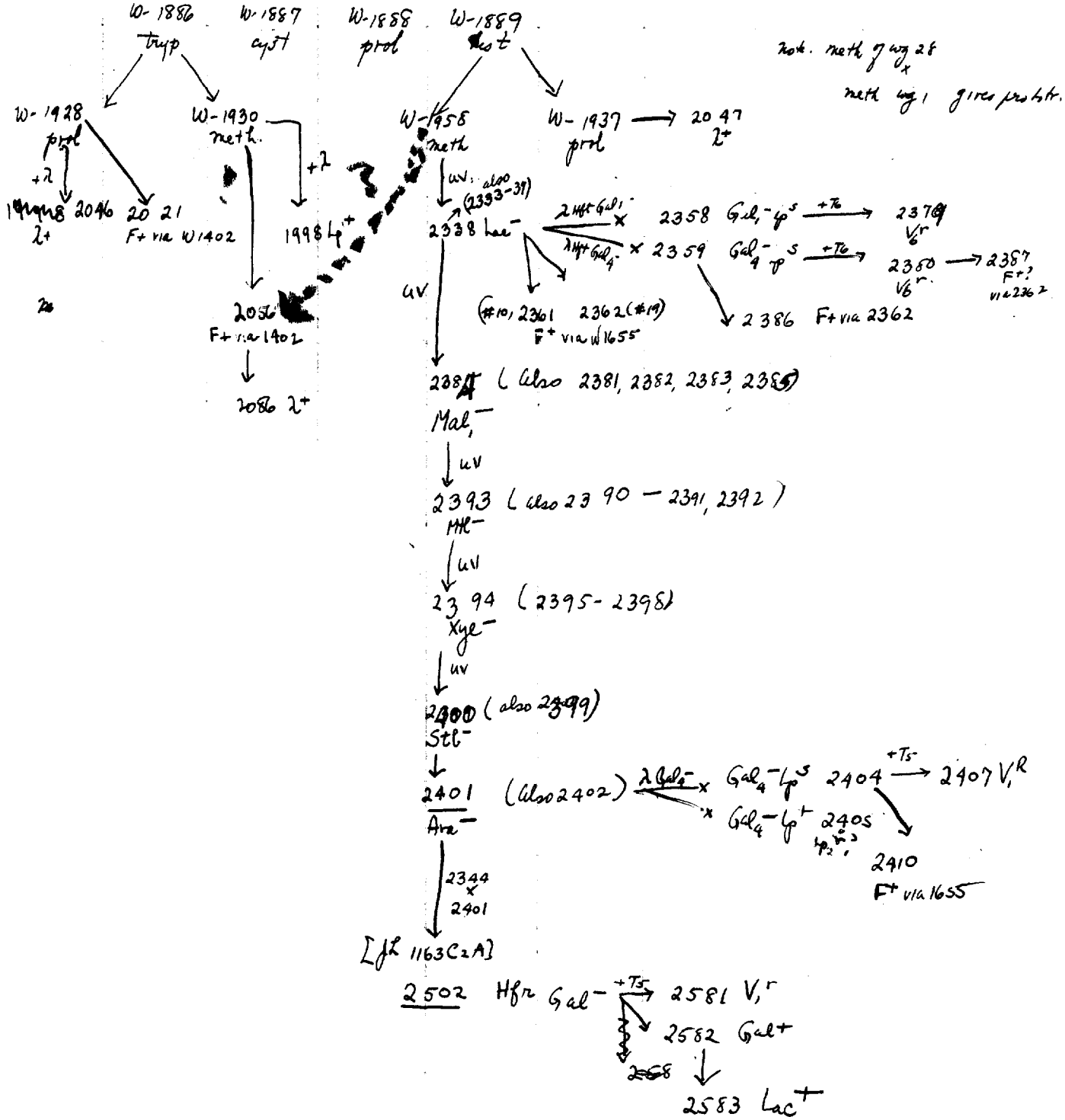
W2272 (Hist⁻)

E. M. Lederberg

WG 28-A

= W1258-A $(\lambda^s) Mp^s S^r$

F^-



7/5/66 EML

[illegible] of SB2401 line 28A ♀

2401 ara

↑

2400 stl⁻

↑

2394 xyl⁻

↑

2393 mtl⁻

↑

2384 mal⁻

↑

2338 lac⁻ F⁻ S^R λ^S H⁻ A⁻

↑

1958 ? met⁻

↑

1889 his⁻

↑

1258 NTCC123 λ^S F⁻

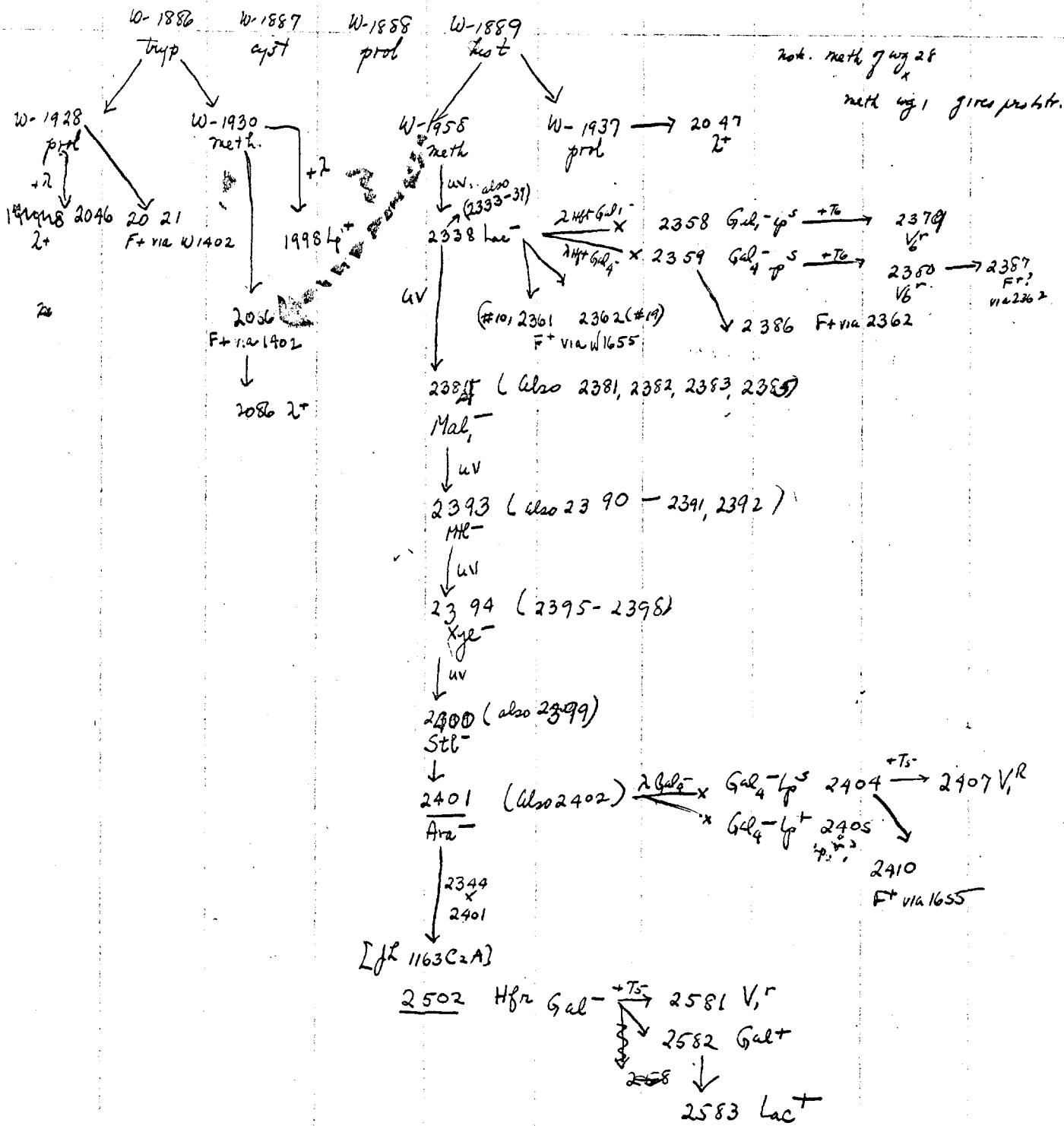
1655

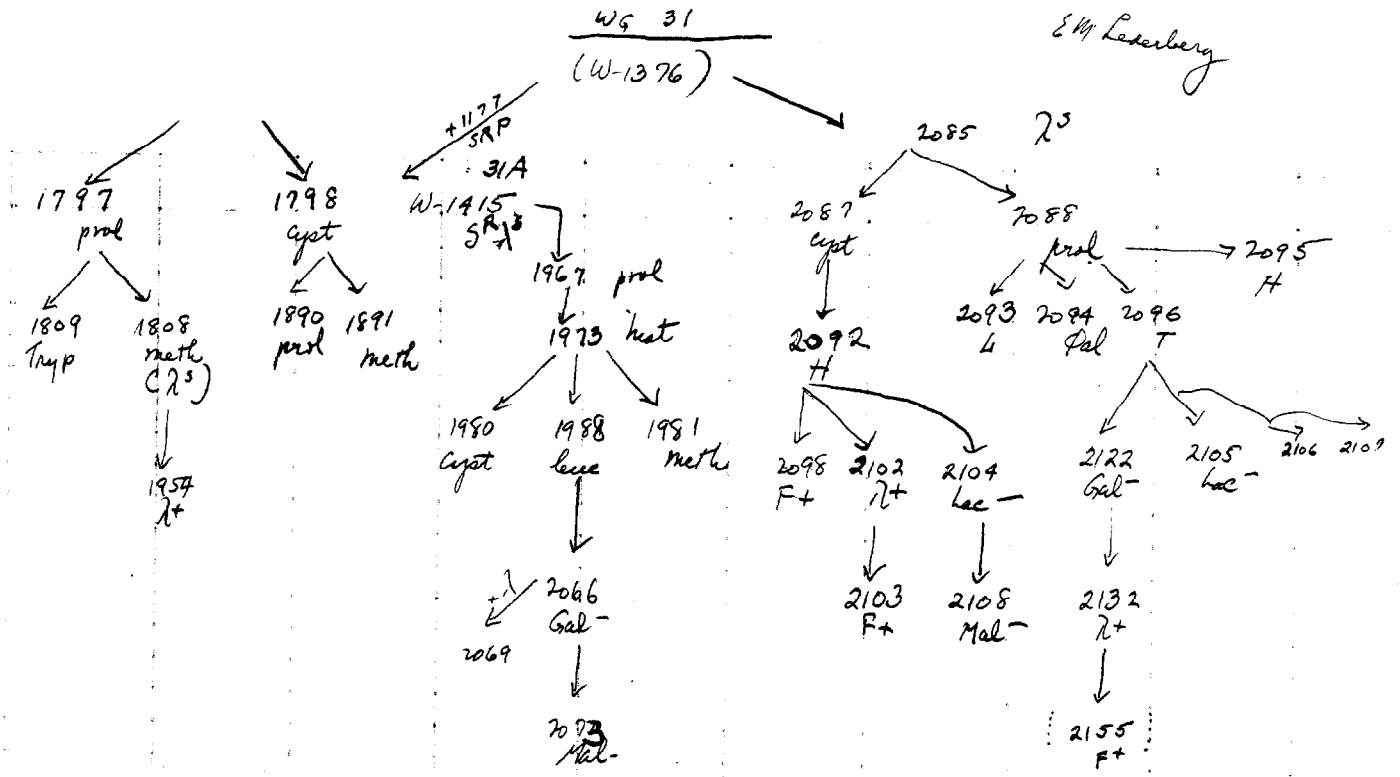
F. M. Lederberg

WG 28-A

= W1258-A $(\lambda^s) Mp^s S^r$

F^-




WG 31
(W-1376)
E.M. Lederberg
+1177 SRP
31A
W-1415
SR+ λ3
1797 prol
1798 cyst
1967 prol
1973 heat
1809 Tryp
1808 meth (λ3)
1890 prol
1891 meth
1957 λ+
1980 cyst
1988 leuc
1981 meth
2066 Gal-
2069
2073 Mal-
2085 λ3
2087 cyst
2088 prol
2095 H
2092 H
2093 L
2094 Pal
2096 T
2098 F+
2102 λ+
2104 Leu-
2103 F+
2108 Mal-
2122 Gal-
2105 Leu-
2106
2109
2132 λ+
2155 F+

Gosling

Wg 33 (W1904)

W1974 prot− ⇒ W1984 prot− ~~trist~~ cyst− → W2017 mal−

W1991 IV− ⟶ IV tryptl (W2006) and IV hist (W2007) → W2014 { IV− hist− mal− lac+

W1992 ϕal−

W1993 tryptl−

W1994 hist−

W1996 aromatic (requires ϕal + tryptl + tyrosine)

gosling

Crosses with Wg 33 and Wg 34.

Wg 33

W2006 (Wg 33) x W1984 (Wg 33) → 0
2006 x W1990 (Wg 34) → 0
2006 x W1177 → 6 very small
2006 x W1817 → 25

Wg 34

W1990 (Wg 34) x W1964 (Wg 34) → 0
1990 x W2006 (Wg 33) → 21 very small
1990 x W1865 (Wg 12) → 0
1990 x W1902 (Wg 13) → 1
1990 x W1177 → 1 small
1990 x W1817 → ca 350

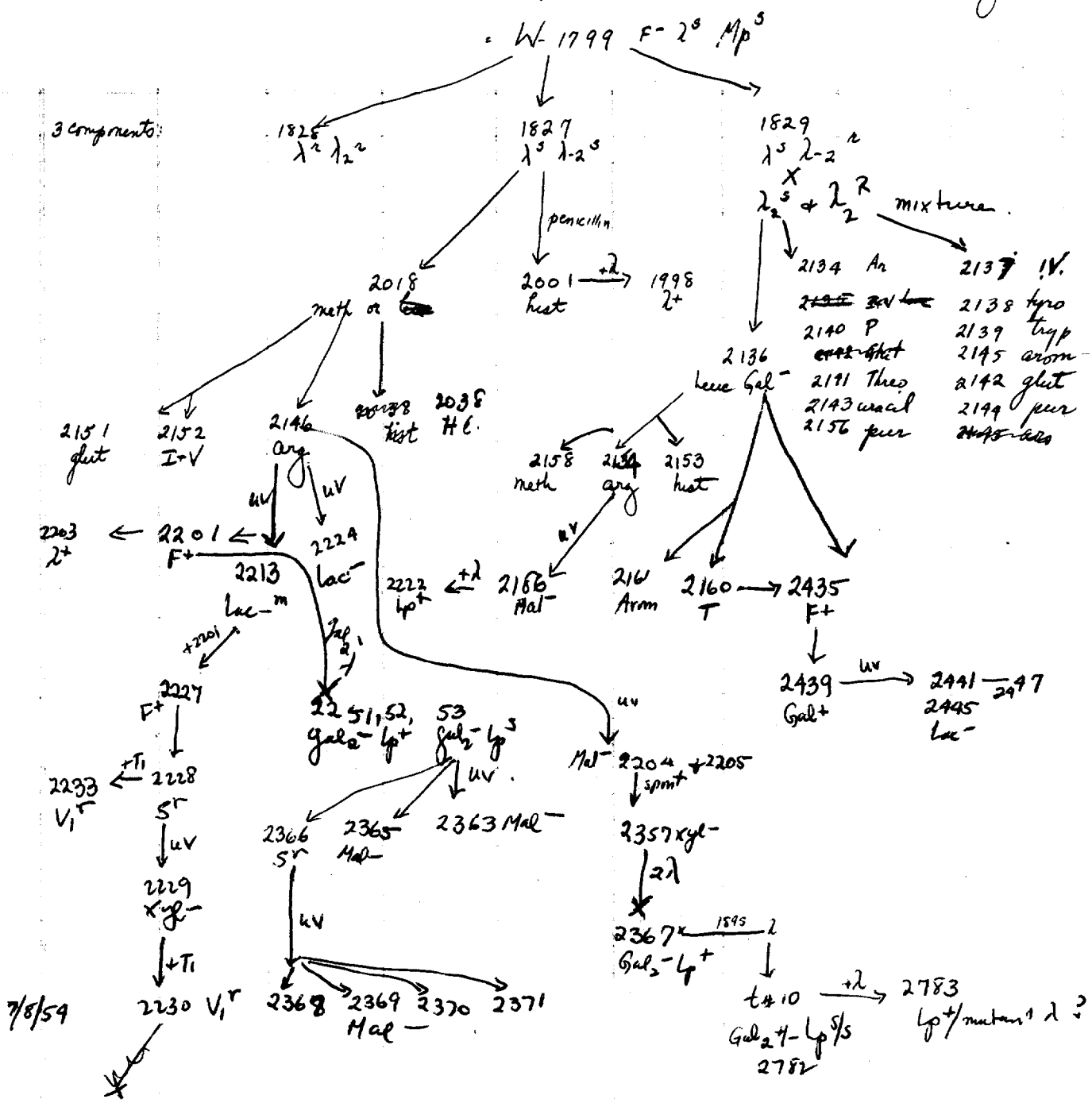
Gasting

Wg 34 (W1905)

W1933 hist- → W1990 hist- cyst-
W1952 lac- → W1964 prol-lac- → W2009 prol lac-SR
W1961 prol-

WG 47

E M Lederberg



Wg 50 (W1939)

W2008 malt

WG 5.1 = W2049

Rec'd from Weigel as C

= NTCC #122 Related to 28 & 28A?

+2 → 2176 4^+

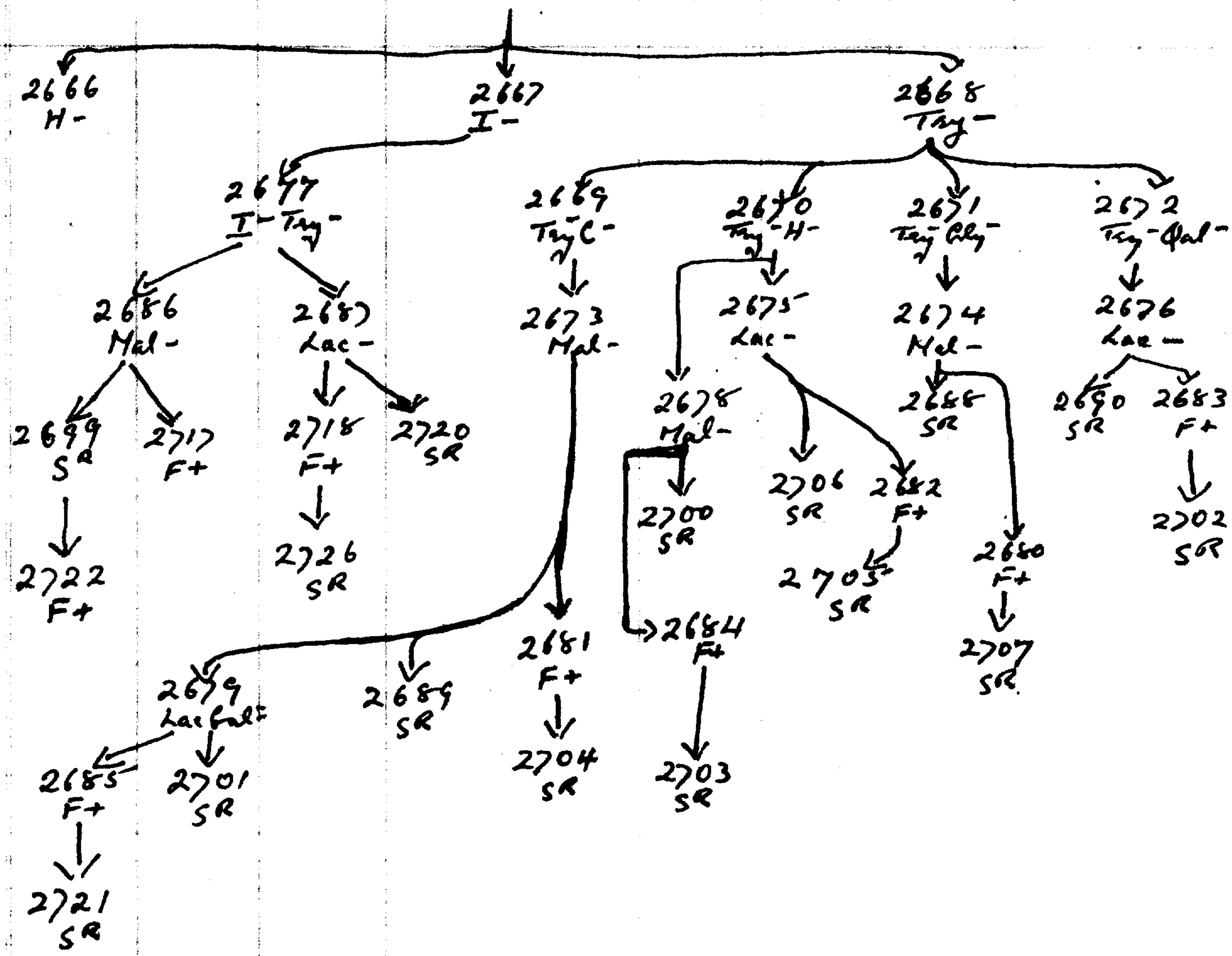
2376 Bertani C (P2) Mal-

2

1954-5

W 56 = W 2665 (Bernstein)

F- Suc- S^s V1-? R λ1λ2 neo.



[illegible signature]

WG 57 = W2691 F-5[5] V_1–7 neg. T_1, T_2 neg.

2719
F+

Erwinia strains × W1177.

Jan 10 ff. 1951.

Repeat E. amylovora & E. carotovora × W1177. (EMS Lac sm.) 30 + 37°.

1 car.
2 amy.
3 "
4 car.
5 amy.
6 "

All ~~carotovora~~ amylovora strains gave 20–30 colonies, Lac+, on EMS Lac sm. At 30°, heavy background; at 37° light background but the colonies were pronounced Lac+

carotovora gave scattered dense background but no colonies.

Repeat amylovora crosses & controls. Pick colonies from "2". and streak on EMB Lac, 37°.

New controls and crosses (grown together briefly) gave no colonies at 37.

Or 2 × above eventually gave a gummy Lac+ growing at 37.

Repeat cross under initial conditions (long growth together).

2/17 (5 days on EMS; 6 in broth)

---

776. Orr

C1.	no sm:	1 Lac"+" colony seen.	1	N.G.
C2		0		
X1	" "	2 "	3-4	lac−
X1	sm	1 very tiny.		
X2	"	0		
W1-2 3 plates		0		
W2		1 Lac+?	2	lac−

glucose+ but no growth on D(0)

No lac+

Repick and test for prototrophy.

∴ no prototrophs grew out!

1/19/51. ff.

	Suca	Sto colicin	Cello.	Mal	Sm.		x 1177 on EMS Lac sm.	
128	+	−	++	+	S	v. mucoid	0	W1587
129	−	−	−	±		Lac − ±	0	
130	−	−	−	±		"	Ca 400 sm. cols.	
131	±	−	±	+		"	0	
132	−	−	−	+			1 Lac +	
133	−	−	−	+			0	
134	+	±	−	+			0	
135	+ muc	±	−	+			1 Lac +	
136	+	±	−	+			0	
137	+	−	−	+			1 Lac +	
138	+	±	−	+			0	
139	−	−	−	+			1 Lac +	
140	−	−	−	+	↓		0	

#		S_M	Mal	Cb	φ or K W1321	Suc	
141[#]	6312	S	+	−	−	−	3L+
142	5914	S	+	−	±	−	0
143		S	+	−	−	−	0
(144)		S	+	−	−	++	1Lac+ 17 Lac?
145		S	+	−	−	−	0
146		R	+ muc	++ muc	−	+ muc	
147		R	+ muc	+ muc	−	+ muc	
148		S	+	−	−	++	4 Lac+
149		S	+	−	+	− M	0
150				±		−	0
151				−		−	0
152	Lac+			−		−	3 Lac+
(153)	Lac−			−		−	1 Lac+, −?

WW-M

S^R photographs

Repeat 148, 144.

		Lac	Mal	Cb	Suc	colicin	
154	UC 257F	(++)	$+^m$; $+^m$	−	−	−	0 0
155	267 F	$\pm^m$		+	+	±	1 muc
156	262 F	−		−	++	−	0 0
157	UC — F	++		−	−	++	0 0
158	" "	++		−	−	−	0 0
159	" "	++		−	−	±	0 0
160	" "	++		−	−	++	00
538	" U	++ m?		−	++	± − strong!	0
(162) 518	" U	+	φ?	±	++	+	5 Lac+ 6 Lac+ ~~Lac-Mal-~~ others lethal 162 pac
~~163 504~~	~~" Thait~~	~~coli??~~					

all these S

slow

			Colicin		
163	UW-U. 13150		+		0
164	" 14511		+		0
165	"		−		ca 60 large +
166			±		0
167		S^R	+		
168	"		−		0
169		Suc +	++		0
170		"	−		4 +
171	"	"	−	0	8
172		"	−		0
173			+	not carbonated 1/52 Emb	0
174	"	Suc +	−	0	0
175		Suc +	−±	0	1+ 1+ → 1 S^D
176			−		~~[illegible]~~ 1+ ~~[illegible]~~! Mal v. slow of ++ pac!
177	S^R		+++ ✓		1 sm − S^D
178			−		0
179	"		−		0
180			+		0
181		(Aerobacter) Cb + Suc +	−		0
182	"	Lac+ Suc+	−	0	
183		Lac− Suc+!	−	0	

184 } + +++ 0
185 } − S^R −

unret.

restreak 162
156

for m.v. 170

all these cb −

Suc +

		Suc	Colicin		Cb	X 1177	
186		++	−		−	~~2 tiny~~ 2 Lac+	
187	Bdnskoff	−	−		−	0 0	
188	2/23	±	+-		−	2 tiny ~~[illegible]~~	0
189	mouse	−	−		−		
190	f.	±	−		−	1	
191		−	±-		−	0	
192		±	−		−	2+	
193		±.	−		−	0	
194	"S"	±	−		−	0	

Repeats with controls

141	sl	1 Lac+ 1?
144	sl	1, 5, 6
148	sl	3+, 2?
152		0
153	sl	0 0
155		00 1+
162		0 1?
165	sl	0 0
170		1 Lac+ 1?
175		1, 0
176		0, 1
177	sl	0 0
171		0

U. Chi

					Suc	col	Cb		
195	449231	scalp fol.	Lac −		−	−	~~+~~		0
196	345751	eye	Lac −		+	−	~~+~~		0
197	479829	F	Lac −		+	−	+		
198	517533	U	Very rough!		−	+++	−		
199	Bettin	F			+	−	−	*	0 0 1+
200	519143		v. gum		±	−	+		
201	372732	U	v. gummy	SR!	±	±	+		
202	61130	F			−	++	−		1 Malt ~~tiny~~
203	519432		Lac − ?		−	−	+		0
204	278696	Thr	Proteus?		+	−	+		1 M+
205	405568	F	Lac −	Xyl −	+	−	−		
206	520165	U			+	−	−		
207	321610	F			+g	−	−		0
208	Kenelnowa	Thr	Lac slow	pigmented	+g+	−	±		0
209	520063	F			−	−	−	*	0
210	274372				+	− ~~[illegible]~~ plaques	−	*	0 00
211	519697				+	− ? plaques	−	*	~~[illegible]~~ 1+
212	520116	Vag			+	−	−	*	~~[illegible]~~ 1+
213	196082	U	Lac −		+	−	±	*	00

175, 177 } very unlikely as crossable

176 ??

	U. chi. 2/26/51		Lac	Suc	col	Cb	Sy	Xyl		
214	P 100333	ANL F		±	−	−	P	+	0	
slant 215	P 314101			−	−	−	RP	+	5 Mal −	did not grow out on EMB Mal SD
216	P 483250			−	−	−	P	−	1 M+	
217	P 510676	paac F	−	−	−	−		+	0	
218	P 520320	F		−	++	−		+	0	
219	P 519389	±		±	−	−		+	1 tiny M+	
220	18257	U		−	++	−		+		
221	519824	U	− tiny	−	−	−		inh	0 0.	
222	P 519530	F	+ gummy	+ g	−	−		+	1 gumming +	
223	P 100340	F LN ANL	± gummy	+ g	−	+		+	0	
224	P 100340	" "		+	−	−		+	50 - 100 Malt, − ?	
225	298848	U	−	−	−	−	R	−		
226	P - ANL	F		−	−	−		+	0	
227	P 100340	F LN ANL	− gummy	+	−	+		+	0	
228	100325	LNP		−	+	−		+	0	
229	385576 P			++	−	−		+	0	
230	P 418566	F hemol.		±	−	−		+	0	
~~231~~ ~~232~~	CA Stuart 2/26									
sl 231	4412			−	−	−		+	5 ~~Malt~~ Lac+	
232	26711		Lac − m	−	−	−		+	6 Mal ?	Par. mixture Malt. Parent mal − m
233	W 370		mixed +, ±	+	−	−		−	5 Mal+	
234	BB45		glassy gr.	−	−			+	4?	W4548 Wg 13
235	1711		−	÷	+			±	0	
236	DH19		+	÷	−			+	1 M+	W1584 Prolineless!
237	BB34		−	++	−			+	3?	
238	3411		ng. back; cl	±	−			+	0	
239	4411			−	−			÷	0	
240	BB4		+	++	−			÷	0	
241	33211		−	−	−			+	0	
242	W539		+	−	−			+	0	
243	DH40		slow	−	−			+	0	
244	V1		+	−	−			+	0	
245	V7		+	+	−			+	0	
246	V16		+	−	−			+	0	
247	V5			− p?	+			+	0	
248	V9			−	−			+	0	
249	BB2			m	−	all cellobiose-negative	all S	+	1 tiny +	
sl 250	AR41			−	−			÷	Ca 100 Mal + Lac+ (par. 250)	
251? 251	DH9		Aerob.	−	−			+	0	
252	W175			−	−			+	0	
253	W282		~~[illegible]~~ ?	+	±			+	0 0	
254	W545		+	−	−			+	0	
255	W710		±, +	−	−			±	0 0	
256	CB7		±	−	−			÷	0	
257	W485		++	−	−			+	0	
258	BB3			++	−			+	0 0	
259	~~DH7~~ MB27		slow	−	−			+		
260	DH7			++	(++)					

not repeated Reichel!

EMS M. O SM 3/1/51 / 8/52

#	EA Struct 2/26	lac	Suc	col Cb	Sm	Xyl	X W1177	X1817
261	CS H140		–	–		+	0	
262	W402		–	–		+	0	
263	CB6		–	–		+	0	
264	W61		–	±		+	0	
265	W85		–	±		+	1 Mal+	
(266)	W1	–	–	+		+	1₀ Mal + CR✓ – (parent Mal+) prototr.	
267	CB9		±	–		+	0	
268	MB22		–	+	all S	–	2 Mal+ : ~~parent is Mal⁻ mutable~~	
269	D14		–	–		+	ca 50 Lac+ Mal+ (269 par.)	
270	CB8		+	–		+	1₀ M+	
							3/3/51	
271	uw –		±	–		+	0	~~0 pinpoint backgr~~
272	–		++	–		+	0	~~0~~
273	–		–	–		+	0	~~0~~
274	–		–	+		+	0	
275	–		++	–		+	0	
276	Kauffmann 1		÷	++ P		–	0	0 pinpt backgr
277	2		–	++ P		+	0	0
278	3		–	++		+	0	0
279	4		–	+		+	Turbid.	
280	5		–	÷		+	Turbid!	
281	6		–	±		+	0	1+
282	7		++	–		+	0	0
283	8		–	–		+	0	4?–
284	9		+ γ	++ P		+	Turbid.	SR?
285	10		–	–		+	"	
286	11		–	–		+	0	0
287	12		–	–		+	ca 100–200 Mal+	part of plate!
288	13		–	–		+	ca 100 Mal?	But 288 – SS R
289	14		±	–		+	0	30+, many ?±
290	15		–	++ P		+	0	0
291	16		–	±		+	0	0
292	17		–	–		+	Few minute colonies : Repeat	3+
293	18 WGS2 = W1568		–	–		+	1 M+	30+ 10±? 1–?
294	19		–	? x?		+	3 Mal+?	0
295	20 WGS3 W1570		–	–		+	0	3+ 30– scab-fut.
296	21 WGS4 1571		–	–		+	0	20+ 100– ?
297	22		–	+		+	0	4+ 2–? n.g.
298	23		±	[illegible]		+	0	0
299	24		±	+++		+	0	0
300	25 WGS5 1575		±	–		+	0	3–? ✓

Margin (271–300): start each — W1551 – 1575

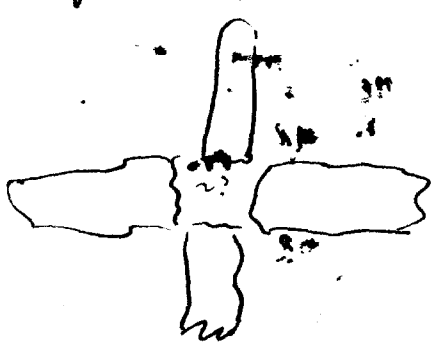
R × 1817 ca 100 mostly –
K × 2058 ca 400 mostly –

● with 518 resistant mutants! Streak out on EMB lac for retest of R.

Note high proportion of colicin producers in Kauffmann's series

Rechecks colicin interactions, and verify numbering of all of Stuart cultures found Suc+ Replate from original vial (C.A.S.) and cross-streak.

Each was Suc+ as reported, but none showed reciprocal inhibition as first noted for 776-760. This was probably an artifact (personal hint?)



The numbering is re-assured!

Cultures rec'd from Benham 3/3/51. Mos ducitity to Int Permassay.

No.	Strain			Lac	S-Suc	58 Ck	Cb	× W1177 EMS Mal sm	
301	P 474632	F							
2	LNP 100345	F		+	[illegible]		−	0	
3	P517488	F	parac	±	+		+^m ?	0	
4	84467	F		+	++		−	ca 50+, (−?)	parent mixed? Lac+, Lac−
5	501064	F		+	++		−	1+	
6	520817 P	F		±	±^m		+	Moldy plate; retest	
7	498633	U		+	−	±	−	0	
8	517488	F		+	−		−	ca 100+	
9	520165	U		+	−	++	−		
10	100366	U	P/ANL	+	±^m		−	0	
11	P520927	F		±	±^m		+	0 0	
12	~~500~~684	~~F~~		±	÷		+	0	
13	P249502	F		+	±		+	0	
14	520791	U		+	+		+	25+	
15	519187	U		s.g.	+		−s.g.	ca 10+	
16	448851	U		+	−	±	−	0	
17	P369483	F		+	−		−	ca 50-100+	

all S

Recd. 3/5 C P Miller : Mouse (X-Ray)

No.				Suc	Ck	Cb		
318	1	MB	700r	−	−	−	2+ (strong satellite effect)	
19	2	"	"	−	−	−	0	
20	3	"	"	−	−	−	6+	
21	4	"	500r	−	−	−	~~2+~~	
22	5	"	"	±	−	−	8+?	
23	6	F		±	−	−	2+ 1−?	
24	7	MB		±	−	−	10+ survival−? sm. col. ~~[illegible]~~	
25	8	"		±	−	−	1+	
26	9	F		−	±	−	2+ 2−?	
27	10	"	"	±	−	−	0 0	
28	11	"		++	−	−	0	
29	12	"		±	−	−	0	
30	13	"	"	− P	++	−	0	
31	14	"	"	±	+	−	1+ 2−?	
32	15	"		±	−	−	10+	
33	16			++	−	−	Mal−? Maltose mutabile [illegible]	1−
34	17	"	"	±	−	−	2+	
35	18	"		±	+	−	0	
36	19	MB	"	++	−	−	0	
337	20	F		++	±	−	0	

CA Stuart claims that 771-266
ferments lactose, later reverses pH!
I could not confirm this on EMB
or on NB-lactose-BCP.
Recheck: several isolates verified λ^R J

✓✓ some Kaufmann strains EMB Mal, Lac
W 15..68, 70, 71, 72, 75 are verified pure +
72 "SRP" n.g. in one day. Hold n.g.
✓ isolates from EMS Mal on

	Mal	Mtl	Lac	Gal	
68	4-	+	+	+	} segregating K/O ?
70	4-	+	+	+	
71	3-1+	+	+	+	
75	1-1-	- -	- +	- +	all K?

Recd. 3/7/51. Miller X-Ray mouse . All Cb − Rham+ λ^R

				Suc	Ck		
3/7/51 338	21	Mal m		−	−	0	
39	22			−	−	2+	
40	23			+	−	3 +	
41	24			+	−	1+ 1− ?? v. small	++
42	25			−	−	1+	
43	26			−	−	3 +	✓
44	27	S^R		+	−?		
45	28			−	−	4+	
46	29			++	−	1− ?	+,
47	30			++	−	0	
48	31			− p	+	0	
49	32			±	+		
50	33			±	−	4 + −?	+ − ? ✓
51	34			±	+	2 ++	
52	35			±	−	4 ++	
53	36			−	+	0	
54	37			++	±	2 +	
55	38			−	+	ca 100 +	
56	39			−	+	5 ± 1− ?	
357	40			++	−		

UW-PHL. Human cultures 3/8/51. all λ^-

				Suc	Ck		
358	18399	Mal −	Cb ±	−		0	Mal-mutable
59	20879			++	++	0	
60	−			±		0	
61	−			−	+	0	later 6-7 Mal-on plate. grow very slowly.
62				++	−	0	
63				++	−	0	
64				+	++	3 large.	
65				±	++	0	
66		Lac−slp	Cb ±	−	−	0	
67				−	±		
68				++	++	0	
69				−	±	0	
~~70~~		S^R		−	−?✓	lysogenic phage	
71				−	+	0	
72		Lac− Mal−		−	−	0	Mal-stable
~~73~~		S^R		−	−?	lysogenic phage	may be duplicate of 370
74				++	−	0	
75				++	− x	0	
76	aerogenes			+	−	1+8	

3/14/51.

Restreaks from EMS Mal sm. to same. Repeats single colonies to EMB Lac + Mal. EMS Mal sm.

A

			L	M	
1	326	Mal −?	+	+	
2	"	"	+	+	
3	"	Mal + g	+	+	
4	"	"	+	−	
5	318	−?	+	−?	} did not grow out (C:++)
6	"	+ sl.	+	−?	
7	341	+	+	+	
8	"	+	+	+	
9	216	+	+	+	
10	287	−?	+	+	
11	346	+	+	+	346²: n.g.
12	215	±	+		
13	"	±	+		2 n.g. +
14	356	+			
15	"	+			
16	"	+			
17	"	+	+		
18	"	+	+		
19	324	+	+		self-plaquing.
20	"	+	+		
21	"	+			
22	331	+			2 n.g.
23	308				
24	"				
25	"				
26	"				
27	350	+	+	−	
28	"	±			
29	"	±			
30	"	±			

B

		L	M	
31	199	+	+	
32	323	+	+	
33	"	+	+	
34	"	+	+	
35	351	+	+	
36	"	+ −	?	
37	170	+	+	
38	333	+	+	
39	215	+	+	
40	"	+	?	
41	345	+	+	
42	"	+	+	
43	355	+	+	
44	"	+	+	
45	"	+	+	
46	"	+	+	
47	234	−?		also streak out
48	"	±		
49	"	−		
50	"	+		
51	237	−	−	Very nonparental! also Mtl-Xyl-
52	"	−	−	
53	"	−	−	
54	"	−	−	
55	322	+	+	
56	"	+	+	
57	"	+	+	
58	"	+	+	
59	352	+ gumming	+	
60	"	+ nongumming	+	
	"	+	+	
	"	+		

BB4? 234 (~~324~~)

	Mal	Lac	Xyl
C	+	+	+ (var?)
x 1	−	−	−
" 2	−	+	−
" 3	−	−	−
" 4	−	+	−

Very likely recombining!

141 315 165 349 gave no growth on restreaking

Recd. Burnham 3/14/51

	Lac (original state)	Lac present order	Cb	Su	Ch^5R	Mal-Sm all λ^R	XW1177
377	+	+	−	−	−	R	
78	+	+	−	−	−		0
79	+	+	−	−	−		0
80	+	+	−	−	−		0
81	+	+	−	−	++		0
82	±	±	++	+g	−	R	
83	+	+	−	−	−		1+
84√	+g	+g	±	+g	±		0
85	+	+	−	++	−		0
86	±	+	−	−	−		Ca 500 Mal+. Recheck.
87	+	+	−	−	−		1?
88	+g	+g	++g	±g	−		2 muc
89	+g	+	−	−g	++		0
90	−	−	++	±g	−		Turbid.
91	−	−	−	−	+		0
92	−	+	g	−	−		1+
93	−	−	−	−	−		0
94	+	+	−	−	+		0
95	+g	−	−	−	−	R	
96	−g	+	−	−	+		1?
97	+g	+	−	−	+		0
98	+g	+	−	−	−		Ca 40 Mal+ and Mal−. W1549
99	+	+	−	−	−		5 small+
400	+g	+		+	±		0
			400a				
401	+g	+g	++	+g	−		probably 406 out of order
402	+g	+g	++	+g	−		5 muc+
403	+	+	−	+	−		Ca 40 Mal+ and Mal−. W1550
404	+	+	−	−	−		0
405	+	+	−	−	−		10+ → all −+ Recheck
406	−	−	++ ++	±	−		8+ → all −+ Not repeatable
407	±	±	++ +	++	−	R	
408	+	+g	− +	−	−		
409	−g	−	+ +	+g	−		
410	±	±	−	÷	−	Mal− p.g.	
411	−	−	−	−	±	Mal−	
412	− p.g.	−g	++	++	−		
413	+	+	−	−	+		3+

(boxed note beside 92–400: present order probably broken totally with this numbering)

L. M. Sucrose:

398: 8 streaked out ++ ++ ++ ++−− ++ ++ −−

403: (+−) −− −− −− ++ ++ ++ ++

268 0 0

See over

On cellobiose plates,

11 spots were found on mins 391-400

9 " " " " 401-410.

These had following character:

	Cb	Suc	Suc original mins	Lac orig.
	−	−	−	−
	−	−	−	+
	−	−	−	−
	−	−	−	+
	−	−	−	−
	−	−	−	+
	−	−	−	+
	−	−	−	+
	−	−	−	+
	−	+	+	400 +
400a	+	+g		
	+	+g	+g	401 +
	+	+g	+g	+
	−	+	+w	+
	−	−	−	+
	−	−	−	406 −
	+	+	±	+
	−	−	++	+
	+	+	−	−
	−	−	+g	+
	+	+		
	−pong.	p.g.	−p.g.	

It is inferred that 406 was misplaced to 400a.

Check on EMB Lac; in presumed consecutive sequence.

Recd. 3/12/51 Uchi Benham

?? serum samples?

are only had coli

~~776~~	~~5805~~
77	5711
78	5708
~~79~~	~~[illegible]~~
779-80	6557
780 81	4982
781 82	5712
782 83	5710
783 84	5396
884 85	5713
785 86	5125
786 87	6382
787 88	6551
788	5805

Verification and Repeat tests

287C	0	x : 1 +	Repeat!
162 X	0,0		
215 X	1+, 1-?	6+ 1-?	
266 C	0		
X	0, 1		Repeat!
144:	Mis-test		
153:	"		
279 C	0		
286 C	2 -?		Repeat!
165 X	ca 10+		
284 C	0	!	
280 C	0		
148 X	1+		

In addition to purification and classification of above, further courses should be done on:

232.: smaller grooming colonies prove to be Mal-mutable also! Repeat i controls

Verifications & Repeats

Summary.

characters ✓ 162 ✓ 1 prototroph [W1177] = W1546

165 : x several [par]

170 x 4 [par

232 x several [par] = Mal-lac- mutable! Others picked from EMB Mal streaks: X^- (= W1177)

~~268. x~~ grew out poorly. Recovered [1177].

~~215 x S^D~~

175 x 1 S^D 1 [par]

176 x 1 [par] but v. slow on EMB Mal

177 1 S^D

266 ✓ 1 X^+ [W1177]. Par. X^- ! W1547

269 x many X^+ [par]

250 x " "

231 x ca 5 " " .

Recrosses

250 x ca 60 Mal+. But 250C: also 60-100 Mal+

Repeat 288 C. ca. 100 Mal+. (mutation!) (But 288X: 0)! Repeat!

~~231~~

141 ca 50 +

170 1 +

269 x ca 60+ 3 morph. types But 269C also 60-100 Mal+ (Mal = also?)

224 x Turbid! (+, -?) Lost of plating medium. (turbid plate streaked out and colonies tested 30: all Mal+ or --)
224C: turbid

317 x C: 0 X: 0 Again 317X: 1 M+

776

Summary 3/19/51.

In series 377-413, Rechecks group of 11 cultures to insure correct recovery of "398" and "403". Cellobiose plate shows 11 spots in row 391-400 and 9 in 401-410 bespeaking a misplacement. Also confirm S^R from 386

B) Repeat 287, 266, 285 C, X

Criteria in ostrose tests.

a) 10 or more X^+S^R in first test

1) Occurring consistently in repeated tests, not in controls

or

b) Any X^+S^R in first test showing a non-parental combination.

Program 3/21/51. [illegible]

W1177 [illegible]

~: faint turbidity X: [illegible] turbidity

130 ✓ C , X
141 X 1 ?
144 X 11+,-??
153 X
165 X
176 X
215 X

234 ✓ P C 0 0 / X 0 0

~~232~~ separate +, - X + ca 20 m 1 M+ (Try P) A 1- B 1-
233 X 1+?
268 ~~separate~~ X pure +
279 C , X C 1? X 2?
280 " C 0 X 2+
284 " 0 0
287 " X 1+ C 3+ 4" -"

234 ✓, 337 } Clean up.

292 X ca 20+
~~294~~ X 0
~~304~~ (sep. +, -) X 304+ 13+ 304- Turbid! P C 4-5 X 4-5 [illegible]
~~308~~ X crowded + But 308^c also
~~314~~ X 0
~~315~~ X
~~333~~ X 0 P C 0 X 0 333+ 0
~~402~~ X 0
~~405~~ X 0 405 P 1+ C 1 X 0 406 do.
~~408~~ X 0
318 X 2+
356 ~~X~~ - 0
324 X 0 P C 0 X 0

350 X 0
355 X 0
361 X 2-

3/21/51

130 Many small cols.

141 ① ?? ② 50+

144 ① 18 Lac ? ② 4 ++

153 (Lac -) 1 Lac+ ? ② 0

162 1 Lac-Mal- . Sterile no further tests

165 ① 60 ++ ② 0 ③ 10++

176 ① 1 Mal± (parent is ++) ② 0, 1

215 ① 5 Mal- did not grow out 8⁰? ② +, - ? : ++ ③ 3+ 1-?

~~224~~ ① 50-100 Malt, - ? Ⓒ turbid

~~231~~ 5 M+L+ ② 0

232 16 M? (232 par: M+ - mixed) Parent mal- lac-

233 5 M+L+

~~234~~ 4: mix. +, - ~~② many "+ -"~~ ~~Ⓒ turbid~~ ✓✓

~~237~~ 3-4: +, - ✓✓

~~250~~ ① 100 M+L+. ② 60 ++ Ⓒ 60-100 ++

~~266~~: ① 1 [WIII77 ML] ② 0, 1 ⓒ 0

268: ① 2 M+ [par mutable -] did not grow out

~~269~~: ① 50 ++ ② 60++ ⓒ 60 ++

279 ① Turbid ⓒ 0
280 " ⓒ 0
284 " ⓒ 0
285 " ⓒ 2 - ?
287 ① 100-200 M+ ② 1++ ⓒ 0
~~288~~ 100 M? ③ 288C → SR.
292 minute colonies
294 3 M- ?
304 ① 50 M+,- (par. Lac -, +). ② - Turbid +
~~308~~ ① 100+ ② 100+ ⓔ ++
314 25+ ++
315 10+
~~317~~ ① 50-100+ ② 0 ⓒ 0 ③ 1
333 ① --
~~386~~ ① 500+ ⓒ Turbid
~~398~~ ① 40+, -
402 ① 5 ++ muc.
~~403~~ + -
405 10++
408 8+
318 ② 2 M- ?

356 ① + − ?

324 ① + − ?

350 ① + − ?

355 ① 100 ++

361 ① 6-7 M-, slow, grew out poorly. → S^D! Not recomb.

In same series as 377-413.

K12 x control — several hundred Mal −, +.

W1177 — 0, 0.

3/20/51 ~~Growth necessary for K12 x W1177 on EMS sm?~~ : (also of existing recombinable stocks)

grown separately

: K12 —
W1490 —
K12 x 1490 several hundred +, —
x 1177 " " "

1	396	2 +
2	397	0
3	398	10-20 + —
4	399	0
5	400	ca 30 +
6	406	0
7	401	0
8	402	0
9	403	10-20 + —
10	404	0
11	405	2 +
	408	0
	409	0
	410	0
	411	0
	412	0

This method ok.

wg stocks by ↑. EMS Mal sm

1	100 − +
2	3+ 1 − (tiny)
3	1 −
4	0
5	Turbid
6	ca 200 +, 100 sm + some − ?
7	0
8	ca 100 +, 200 small + some − ?
9	0
10	7 +

Method may be no more efficacious than mixed culture except where colicin action supervenes, when it should certainly be used.

U. Chicago Benham 3/22/51. xW1177 EMS Mal sens all λR

			Lac	Mal	Suc	Cb	Ck	
414	401120	F	−	+	++	+ −	−	Turbid
415	LN 100410	F P.A.N.L.	+	+	−	± −	±	1+
416	P-520370	F	+	+	−	± −	−	0
417	P-520982	F	+	+	−	+ −	+	0
418	P-381020	F HEM.	+	+	−	−	−	0
419	P-160818	F	+	−	±	−	−	0
420	446552	U	+	+	−	−	−	0
421	P-501021	F	+	+	−	−	±	0
422	521351	THROAT	+γ	+γ	+γ	+	−	0
423	P-SH841	F	+	÷	−	−	−	1+
424	LN100411	F P-ANL	+	+	++	−	−	0
425	467324	U	+γ	+	++	−	−	0
426	441614-P	F	+	+	−	−	−	0
427	P-520347	F	+	−	−	−	−	0
428	521250	U	+γ	+γ	+γ	+γ	−	Turbid
429	P-160818	F	+	+	±±	−	−	6+
430	458645	U	+	+	−	−	−	20+ (vaccille appearance)
431	P-447925	F	+	+	−	−	−	3 − ?
432	P-22795	F HEM.	+	+	++	−	−	0

Benham – Turner 3/24/51

				Cb	Ck	Mal	Suc	all λR
433	T324	Ear	+	−		+	−	1+
434	171	U	+γ	−		+	−	0
435	1505	F	−	÷		+	−	0
(blank) 436	253	U	+ γ	−		+	−	+ − ?] all → lac-Mal- via EMBO
437	1349	Wound	+	−		+	±	0
438	1678	Thr	+	−		+	−	3+ (1 large ++ 2±)
439	330	Foot Lesion	− ⊕ 454	−		−	−	Turbid ±
(blank) 440	1627	Bronchial	+	−		+	−	14+ (−?) → ++ and −− via EMB.O
441	1528	Throat	+	−		+	+	Turbid
442	1588	U	+	−		+	−	0
443	1428	F	−	−	±	+	−	0
444	1650	Tonsil	+	−	−	+	−	
445	120	U	±	÷		−	+ γ	Turbid
446	1595	Throat	+	−		−	+	2+
447	393	U	+	÷		+	−	0
448	1471	Branch	− γ	+γ		−	+	0
449	237	Branch	+	÷	rg?	−	++	0
450	1684	F. Fistula	+	−		+	+	0
451	1498	U	+	−		++	+ γ	10+
452	1464	Vag.	+	−		−	+ ±	10+
453	—	—	+ γ	+γ		−	+ γ	Turbid
454	see 439			+γ		−	+	2+

OK.

U. Chi. – Bohnhoff March 29, 1951.

#	Lac	Cb	Su	Ch	Sign		all Mal+ λ^R Mal+ Cb – EMSMal × W1177
455	47	+		–	–	P	
456	48	+		–	÷	R	
457	49	±		±	–		0
458	50	+		–	÷		1+
459	51	+		–	–		0
460	52	+		+	+		11+
461	53	+		+	–		0
462	54	(–)	±, +	–	–		0
463	55	+		–	–		0
464	56	+		±	–		2+
465	58	+		–	–		1+
466	59	+		–	–		0
~~467~~	~~60~~	cut		not	–		
468	61	+		++	÷		0
469	62	+		++	–		0
470	63	+		++	–		0
471	64	+		++	++		0
(472)	65	+		–	÷		0 =(473)
473	66	+		–	–		0 Ca 100+, –? background!
474	67	+		–	–		0
475	68	+		–	–		3 – ? Fertile
476	69	+		–	÷		0
(477)	70	+		–	–		ca 150 –? Remain small.
~~478~~	71	+	(±)	±	–		2+
(479)	72	+	(–)	÷	–	R	Ca 10+? 3–? Fertile
480	73	+		±	–		0
481	74	+		–	–		0
482	75	+		–	–		1–? w. gr EMB
483	76	+		++	–		0
484	77	+		±	–		0
485	78	+		–	–		0

4W-PHL (urine cultures)

~~486~~	~~pour out~~					
487		+		±	–	0
488		+		–	+	R T
489		+		++	–	4+
490		+		–	–	Ca 150+ Some small –? background 3
491		+		–	–	1+
492		+		±	–	6
493		+		–	–	4+
494		+		–	–	0

425: compare 468, 469, 470.
457-58 are distinct

776 r.

Check photography of 440, 436.

Restreak 440.

---

436. All finally proven photographs were Malt+Yeast like parent, but delayed.

440. " " "

However, this should be repeated again.

U Chicago – Benham – Recd 4/2/51

x W1177/SM

No.	Specimen	Source	Lac	MalSm		Su	Ck	Cb	
~~495~~	452149	F	+	+		−	++	−	0
496	427671	F	+	+		−	−	−	3+
497	448304	F	+	+		±	±	−	0
see infra 498	~~489886~~	~~U~~	−	+		±	−	+	0
499	292625	F	+	+		−	−	−	2 T
500	484071	F	+	+		−	±	−	1+
501	522064	F	−	+		±	−	+	
502	~~64224~~	~~U~~	+	−		−	−	−	ca 150 – ? (like 477)
503	522611	F	+	+		++	−	−	1+
504	299124	F	−	+		−	+	−	0
505	439495	U	±	+		−	−	−	T
506	463920	SPUTUM	−	+		±	−	+	T
507	511218	U	+	+		±	−	−	T
508	522268	F	−	+		−	±	−	10+
509	522084	F	−	+		−	−	−	0
510	330139	F	+	+		−	−	−	0
511	GREENLER	F	+	+		−	±	−	0
512	522035	F	+	+		±	+	−	0
513	445683	F	+	+		−	±	−	ca 30 mucoid +
514	519625	F	+	+		−	−	−	0
515	185708	F	+	+		−	−	−	2+
516	477561	F	+	+		−	+	−	ca 20 +
~~517~~	~~451131~~	~~U~~	+	+		−	±	−	9+
518	485841	U	+g	+		+g	−	+g	ca 40 muc +
519	521422	U (BLADDER)	+g	+	R	+g	−	+g	T
520	1270	VAGINA	+g	+		+g	−	+g	0
521	474858	THROAT	~~+g~~ −g			±	−	+g	4 mucoid 2 ~~non~~
502 ~~522~~	325416	F							
517 ~~523~~	572128	U							
498 ~~524~~	ERLENBORN	F							

4/12/51

No.	Specimen		Lac	MalSm		Su	Ck	Cb	
522	Monkey – enteritis	uw	+	+	S	−	−		
523	nw PHL	29612	+	+		−	+		5+
524	"	29613	+	+		−	−		24+
525	"		+	+		++	##		ca 60+ 2− ! sl. background
526	"		+	+		±	++		−
527	"		+	+		−	‡		−
528	"		+	+		++	−		−
529	"		+	+		−	−		−
530	"		−	−		−	−		−

475 } both gave Mal+ Lac -
479 } and Mal - Lac+
recombinants.

Fertile!

502: Mostly did not grow out. Those which did were partial S^r.
Mal - Lac+. Check, if poss., on MH.

All Xyl- MH+ like 502.

Summary: April 7, 1951.

(234, 237, 398, 403). tentatively accepted as intefutile.
162, 266

Still to be repeated again:

old business

144, 292
361, 153

New prospects:
(+ – ??

(+ – ??	++ only or ?
436	400.
440	430
472	431
477	490
~~479~~ ✓	513
502	518
	521

	1+ 3±	3 tiny –	2 –
440	P	P X	~~X~~
436	0	0	0 0 0
475	1+	(18 +)	0
477	5+ 1 sm –?	5 + 1 –	1~~0~~ –
490	4+	0	0
495	0		
502	6 –	3 tiny –	6 –
479	5+	1	0

Malt S^S λ^R

Bertram — Lac Malsens Su Ch Cb

531	P. 511218	F		++	−	−		0
532	P-524148	F		−	++	−		0
533	522051	U		++	−	−		0
534	522939	U		−	−	−		0
535	P-324274	F		++	−	−		0
536	324931	U		−	+.	−		0
537	500680	U		−	−	−		0
538	P-501572	F		+	−	−		9+
539	391539	F		++	−	−		0
540	52392	U		−	±	−		0
541	294961	F	+	−	++	−		0
542	523925	U		−	−	+		0
543	349760	F		+++	−	−		0
544	524034	U		−	±	−		0
545	P-501519	F		−	−	−		0
546	P-334483	F		−	∓	−		0
547	498458	U		−	−	−		0
548	P 5759	F		−	−	−		0
549	523914	U	↓	−	−	−		5+ 2-tiny
5								

uwPHL 4/16/51 all Malt S^S λ^R Mtl + or ±

550	mucoid	+	++	−	+g	1 −?
551	"		++	−	+g	0
552	"		±	−	+g	Turbid
553	"		+	−	+g	0
554	−		−	+	−	0
555			−	++	−	0
556			−	−	−	0
557			−	+	−	0
~~558~~						
~~559~~						
558			+	+	−	0
559			−	++	−	0
560			+	−	−	0
561			−	−	−	0
562			++	−	−	0
563			++	−	−	0
564			++	−	−	4+
565			−	−	−	Turbid
566		↓	−	−	−	0

Ch's tested for λ. Negative unless otherwise stated

CPMiller(Chi) 5/1/51		Lac	Suc	Cb	Ch	Sm	Mal	λ^R	×EMS Mal sm
567	81	+	++	–	±		–	0	
568	82	+	–	–	–			0	
569	83	+	–	– (crossed)	–			0	
570	84	+	–	–	±			0	
571	85	+	±	–	++			1+	
572	86	+	++	–	+			0	
573	87	+	– p	–	–			5+	
574	88	+	–	–	+			0	
575	89	+	++	–	±			5+	
576	90	+	++	–	±			0	
577	91	+	±	–	–			0	
578	92	+	–	–	–			0	
579	93	+	±	–	±			0	
580	94	–	–	–	–			1+	
581	95	+	– (crossed)	–	–			0	
582	96	+	–	–	–			0	
583	97	+	–	–	–			2±	
584	98	+	±	–	++			1+	
585	99	+	–	–	–			0	
586	100	+	–	–	–			0	
587	101	– + (crossed)	–	+g	–			0	

UW-PHL 5/1/51

	Lac	Suc	Cb	Ch	Sm	Mal	λ^R	×EMS Mal sm
588	– (crossed)	+g	+g	–	R		×T	
589	+	–	–	–			×	R
590	+	– p	–	±			T	
591	–	++g	++g	–	R		/	
592	–	++g	++g	–	R		R	
593	+	+	–	–			×	
594	+	++	–	++			0	
595	+	–	–	–			0	
596	+	–	–	++			0	
597	+	+	–	–			0	
598	+	–	–	–			0	
599	+	+	–	–			0	
600	+	–	–	+++		–	0	
601	+	–	–	±			2±	
602	+	±	–	±			0	
603	–	+g	+g	– (crossed)	R		R	
604	–	±g	+g	–				
605	+	+	–	–			0	
606	+	+	–	–			1±	

Beckham - U. Chi 5/7/51

				Lac	S	Mal	Glc	Cit	Suc	
	607	T662	F	−			−	−	−	O
	608	T452	F				−	±	++	1+
wg17	609	T797	gall bladder				−	−	+	Ca 200 Mal− : 80% lac+
	610	T1247	U		R		−	++	−	
	611	P623432	−				−	−	−	2 ?
	612	P-320694	F				−	−	−	✗ Repeat
wg18	613	T-1430	LUNG				−	−	−	ca 100+; 3 hypero (Lac+ Lac−)
	614	T-1433	BRONCHIAL				−	−	−	T
	615	T-1006	U	± m			+g	−	+	O
	616	T-1163	U				−	++	+++	1+
	617	T-904	U				−	±	++	2 −?
	618	T-664	SPUTUM				−	−	−	4 −?
	619	P-517924	F				−	+	−	2
	620	T-938	WOUND				−	+	−	O
	621	T-852	U	−			+g	−	−	O
	622	T-1716	U				−	−	−	O
	623	T-1506	U	±		-m	−	−	−	O
	624	T-1281	SPUTUM				±	−	−	O
	625	T-919	LUNG		P	I	−	−	−	
	626	T-1643	BRONCHIAL				−	−	−	3 −
	627	T-1623	R. TIBIA				−	−	++	1 −?
	628	T-529	EAR				−	−	++	1 −?
wg19	629	T-968	U	−			+	−	−	5+ → lac+, Suc −, Mal+
	630	T-1010	LUNG				−	−	−	O
	631	T-632	F	−g			+	−	+	O
	632	T-1546	U	+g	R		+	−	++	
	633	T-357	BRONCHIAL				−	±	−	3 ?
	634	T-514	U	+g	R		+	−	+g	
wg20	635	T-718	U				−	++	−	ca 100 Mal+ Lac+
	636	T-1041	F	−			−	−	−	O
	637	T-1617	U				−	−	++	O
	638	T-669	U				−	−	−	4+ 1?
	639	T-687	F	−			±	−	−	T

	Uchi - Benham	Lac	Mal	Mtl	S S	Cb	Ck	Suc	EMS Mol sum		Lac transfer
640	P-444050 F		+ +	+g		++	−	++	25 +		suitable for ferm. mutation → ++
641	P-349760 F	±g				++	−	+g	0		
642	525527 U					−	++	++	0		
643	441814 U					−	−	−	1+		
sl (644)	417961 U					−	++	+	30 M+		+
645	524438 U					−	−	+	T		
646	T-1435 U					−	−	+	T		
647	434910 U					−	−	+	0		
67 → 648	~~437262 U~~					−	++	−	T		
649	511243 U					−	−	−	0		
650	308312-P F					−	+++	−	0		
651	P-308312 F PARACOLON	−				++	±^u	±g	1+		
652	115791 U					−	−	−	0		
653	P-454517 F PARACOLON	−				±	−	+	0		
654	P-1559 F "	−				−	−	−	0		
sl 655	P-523392 F WG21					−	−	++	50 +	5 −	−, (+)
656	P-469762 F					−	−	++	2+		
657 sl	P-449672 F WG22					−	+++	−	30 −		−
(658) sl	P-523877 F					−	++	+	40+		++
659	P-52360 F			−		−	++	+	0		
660	P-445038 F	±g		+g		++	±	+g	0		
sl (661)	P-393085 F			±g		−	+^u	++	2+ 1− ?		
662	P-448812 F PARACOLON	−g		+		+	±^u	+g	0		
663	P-440707 F			+		−	−	−	0		
664	P-446437 F		−	+		−	±	−	0		
665	402951-P F			+		−	±^u	−	0		
666	523643 F			+		−	+^u	−			
667	P-493127 F	±g		+g		+	−	+g	T		
668	P-448780 F PARACOLON	−		±g		±	−	±	T		
669	P-523115 F "			±g		−	++	−			
~~670~~	~~P-524792 F~~										

644 and 658 concluded not fertile but kept in lyophil

644
655
657
658

λ· mlessrndie.

PHL - U.W. 5/8/51

			Lac	Gb	Ch	Suc				
670			+	−	−				T	
sl (671)	43241		+	−	−				ca 100+	L+
wg 672			+	−	−		− Malt		10+, ±? −	Two types on lac
673			+	+	−				0	
674			+	−	−				6+	L+
675			±g	+	−				0	
676			+	−	−				0	
677			+	−	−	−			0	

E. coli Benham Chicago.

			Lac	Gb	Ch	Suc			
678	525518	U	+	−	−			0	
679	321982	U	+	−	−			0	
680	I850	U	+	−	−			1+	
681	P-52253	F	+	−	−	−			
682	P-443220	F	+	−	−	−		10 scallopd cd. ±	
683	524897	U	+	−	−	−		0	
684	T441	SPUTUM	+	+	−	−		7+	Lac+
685	520123	F	−	+	−	+		T	
686	1997		−	+	−	−		T	
687	448812P	F	±	+	−	+		0	
688	T-107	KIDNEY	+	−	−	−		0	
689	785		+	−	−	−		1+?	Lac?
sl (690)	P-521984	F PARACOLON	±	−		−		4+?	2 types lac
691	522624	THROAT	−	+	−	−		T	
709→ 692	~~P-501519~~	~~F PARACOLON~~		−	−	−		0	
693	489599	U	−	+	−	+		0	
sl 710→ (694)	~~526419~~	~~U~~	−	−	−	−	mal −	600+	L+
695	T-20	F	+	−	−	−		0	
696	T-503	F	−	+	−	+		0	
697	T-1	F	+	−	−	+		0	
698	T-403	F	+	−	−	−		T	
699	T-394	F	−	−	−	−		0	
700	T-391	F	−	−	−	−		3+	L+
701	T-131	U	−			−		4+ ?	2 types lac
702	T-4	U	+			−		0	
703	T-157	F	+			−		T	
704	T-429	U	±			+		11+	mostly n.g., Lac+
705	T-161	U	±g			+		T	
706	T-391	F	+			−		0	
707	T-482	U	−					0	
708	T-401	F	±g		Spr			T	
~~709~~	T-373	?	−		Spr	−		semi T; repeat & test Ch	
~~710~~	T-139	F	−			−			

Spreader cont.

Repeat: ~~672~~ 672 671 694

PHL - U. W.

				Lac	Cblk	Suc		
709				−	+ −	−		
710				−	+ −	−	0	
711				+	+ ∓[v]	−	50+, same var.	2 Lac + others n.g.
712				+	+ −	+	2+	
713				+	+ −	−	0	
714				+	+ −	− +	0	
715				±	+ −	− +	0	
716				±	+ +	+ +	0	
717				+	+ −	∓ −	1+	M+L+
718				+	+ −	+	0	
719				+	+ −	∓	0	
720				+	+ −	−	semi turbid +, − Everything; no further gs	
721				+	+ −	−	Proteus; +	
sl (722)				+	+ −	−	smeal −? , corner of plate	~~NG~~ small L+ mostly NG
723				+	+ −	−	ca 200+	
flank! (724)				+	+ −	±	6+	Same L − Restrict spreaders.
725	49155			+	± −	±	0	
726				+	+ −	−	0	
727				+	+ −	±	0	
728			Lysogenic	+	+ +[v?v]	−	1+ 1 −?	2 Lac+ {NG / malt}
729				+	+ −	−	0	

Benham - Chicago

				Lac	Cblk	Suc		
730	T-193	F		−	− −	−	7+	n.g.
sl (731)	T-294	U	Lysogenic	+	+ ±[v?]	−	10+ same −?	n.g.
732	T-374	U		(+)	+ −	+g	ca 300+	n.g., 2 Lac+
733	T-1891	U		−g	−g +	+g	T	
734	T-67	U		+	+ −	−	0	
735	T-61	F		+g	± −	+	0	
736	T-481	F		+	± −	+	0	
737	T-1817	AEROGENES		±g	− −	++g	T	
738	T-179	F		−	± −	+g	1v. muc ±	
739	T-1817	Pa		±g	− −	+g	T	

724: grows out very slowly on EMS lac sm.

Repeat 724

4-8-52 731 [illegible]

λ⁻ Malt unlearned.

Benham - Chicago 6/26/51

			Lac	Ck	Suc	Ck	EMSsm Mal (Lac)
740	T-721	U	+		++	–	200 + n.g.
741	T-568	U	+g		–	–	60 mucc? – n.g.
742	#831	U RT. KIDNEY	–		+	–	Malt ~~30 small Mal – ?~~ ~~slough~~ Lac
743	P-228373	F	+		–	–	ca 30 " " ? NG Lac
744	P-326566	F	+		–	–	11 mucc + Lac-pap?
745	P-525618	F	+		–	–	0
746	P-525656	F	–		–	–	0
747	P-442010	F	+		++	–	1? – Lac+Malt
748	T-503	F	+		++	–	0
749	P-526647	F	–g		+	–	0
750	P-525627	F	+		–	++	Num + n.g.
751	T-855	F	–g		+	–	50+, var.size n.g.
752	P-523641	F	+		–	–	many + n.g.
753	P-524786	F	+		–	+	" " n.g.
754	P-447929		+		+	–	50 M+ mostly n.g.; Lac+
755	T-441	Sputum	–		–	–	T
756	P-525625	F	+		++	–	0
757	T-581	F	+		–	–	0
758	T-789	Bile	(+)		–	–	150+ NG
759	T-543	U RT. URETER	(+)		–	–	6+ NG
760	T-514	F	–		–	–	20 mucc + 15± ? Mostly 2 Lac n.g.
761	T-826	U	+g		++p	–	150 + var sig. 3 Lac+ others n.g.
762	T-571	F	+g		–	–	100 + var. sizes 1 Lac+; n.g.
763	T-566	F	+		–	–	4+ NG
764	T-677	Wound	+g		+g	–	all Malt 10 Lac+ (Lac – +?)
sl 765	526561	F	–	Mal- slow		–	~~Mal –~~ ~~Lac+~~
766	T-567	Bile	+		ng	+	0
767	T-669	Bron. Aspir.			–	–	Num + n.g.
768	T-735	U	+		–	–	0
769	T-630	Pus	+		–	–	~~0~~
770	T-586	Bron. Aspir.	+		–	–	
771	T-455	Wound	±g		±	–	0
sl (772)	T-845	F	+		–	–	13+ ca 5 small –
773	T-721	Lung (Post)	±g		g	–	~~0~~ 20 Mucoid+
774	T-547	Vagina	+g		–	–	100+ mostly n.g. 3+
775	T-481	F	–g		+	–	50+ mostly n.g. 1–
776	P-525639	F	+		–	–	300+ " " 1+
777	526446	U					
778	P-511731	F	+		–	±	2+
779	P-526931	F	+		–	–	50+
780	P-449019	F	+g			–	T
834 ~~781~~	~~526391~~	~~U~~ NG	+		–	–	T
782	T-618	Pleural Fl	–		+	–	tiny: some to all Malt, small
783	522900	U	+		–	–	T
784	281645	F	–g		–	–	30+ most n.g. L–
785	T-572	F	+g		–	–	T
786	512712	U					
787	T-584	F	±g		–	–	T
788	459541	F	–		–	–	0

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			Lac	Cb	Mal Suc	Cit	
789	P-65318	F	+		−	−	T
790	414989-P	F	+		±g	±	T
791	P-525654	F	+	−	−	−	T
792	T-520	u	+	−	−	−	T
793	P-525686	F	−	−	−	−	2 all 3+
794	P-487660	F	+	−	−	−	0

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795	151	H.B.	±	−	−	−	0
796	152	H.B.	+	−	−	−	0
797	153	H.B.	+	−	÷	−	1+
798	154	H.B.	+	−	±	−	400
799	155	H.B.	+	−	+	−	T
800	156	H.B.	+	−	−	−	T
801	157	H.B.	+	−	±	−	500+
802	158	H.B.	+	−	++	−	500+
803	159	H.B.	+	±	÷	−	T
sl (804)	160	H.B.	+	−	÷	−	semi T same-?
805	161	H.B.	+	−	−	−	" " "
806	162	F	+g	−	−	−	" " "
807	163	H.B.	+	−	−	−	T
808	164	F	+	−	−	−	T
809	165	H.B.	+	−	−	−	semi T same-
sl (810)	166	H.B.	+	−	mutab. ++	÷	20-30 typ-? all Lac+, pdb mut.
811	167	H.B.	±	−	±	−	T
812	168	H.B.	+	−	±	−	semi T same-
813	169	H.B.	+	−	−	−	semi T same-
814	170	H.B.	+g	−	−	−	" "
815	171	H.B.	+g	−	−	−	"
816	172	F	+	−	−	−	"
817	173	H.B.	+	−	−	−	"
818	174	H.B.	±	−	±	−	T
819	175	H.B.	±	−	±	−	T
820	176	H.B.	+	−	±	−	0
821	177	H.B.	+	−	−	−	semi T -
822	178	H.B.	+	−	±	−	T
823	179	H.B.	+	−	−	−	semi T; same-?
824	180	H.B.	+	−	−	−	"
825	181	F	+	−	±	−	T
826	182	F	±	−	−	−	0
827	183	F	+	−	−	−	semi T same-?
828	184	F	+	−	−	−	" all+
829	185	F	+	−	−	−	T
830	186	F	+	−	−	−	300+
831	187	Colon	+	−	−	−	
832	188	Colon	+	−	−	−	semi T
833	189	Colon	+	−	−	−	T

RECHECK. 776 types.

	SLANT	WG	Previous history Mal	Lac	Remarks	Control Lac	Mal	X Lac	Mal
629	✓		5+	+,−	Lac −				
635	✓		100	100					
644	✓		30	30					
655	✓		50+5−	−(+)					
657	✓		30 −	−					
658	✓		40+	+					
661	✓		2+1−?			v.sm		v sm.	
671	✓		100+	+		T		T	
672	✓	Mal+lac+ pure via	10+,±	+±		0		15 variable +, (−?)	
690	✓		4+	+, 2typ		0		ca 15 +, bc legd..	
694			600+	+		200 −		200 −	
722	✓		small	n.g?		v. sm.		40 v sm	
724	✓		6+	−(spr?)	Lac+✓				
731	✓		100+(−?)	n.g.		Turbid		Turbid	
765	✓		?−	−+?		60 −		60 −	
772	✓		13+ 5 sm			ca 15 +		~~40 +~~ 600#	
810	✓						40 −	900#	
804	Fragile ✓					semi T		semi T.	

Recheck 772, 690, 672

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			Lac	Cb		
781						
~~834~~	190	Ileum				T
Vaughn						
834	127		+	−		T
835	129		+	+	W1647	T
836	130		+	−		T
837	160		+	+		200 small, variable Malt
838	167		+	−		T
839	168		+	+	W1648	10 Mal-odour
840	187		+	+		200 variable Malt; 2 Typho
841	188		+	+		50 variable +
842	331		(+)	−		T
(843)	475		(+)	+		100 large Malt
Benham 844	P-465454		+	−		semi T. Repeat!
846						

804

805
206 etc

may be same organism.

W. W – P. H. L. 7/10/57 all λ^r Mal+ S^s

		LAC	Gly	Suc	Mal	Gla	S	
845	81898	+	–	++		–		0
846		+	–	–		–		0
847		+	–	++		–		2+
848		+	–	–		±		0
849		+(g)	–	–		–		0
850		+(g)	–	–		++		0
851		+	–	+++		–		0
852		+	–	–		–		0
853		±	–	–		–		0
854		±	+	+		–		0
855		+	–	+++		–		0
~~856~~								

Repeat, + 5 units/ml penicillin to mixture with W1177 no Penassay exp. to test activity of penicillin in stimulating recombinations

846-850
852-855 } no prototrophs S^R.

Benham - Chicago 7/16/51 all λ^R S^S Malt

			LAC	Cb	Suc	Mal	ch	S	EMS/Mal
856	P-448151	F	+	−	++		−		T
857	P-457730	F	+	−	−		−	SR	
858	P-278502	F	+	−	− P		++		T
859	527869	u	+	−	+		−		T
860	489015	u	+	−	−		±		300 variable +
861	528763	u	+	−	++		−		0
862	P-301814	F	±	+γ	+γ		−		0
863	P-406231	F	+	−	−		−		T
864	P-525666		±	+γ	+γ		−		40 Mac+
865	P-446497	F	+	−	−		± v		T
866	P-528819	F	+	−	±		−		0
867	ANL101126	F	+	−	±		−		0
868	479425	u	+	−	++		−		0
869	P-499362	F	+	−	++		−		T
870	P-434711	F	±	−	−		−		1+
871	P-522818	F	+	−	−		−		
872	P-487631	F	+	−	±		−		T on Mal; 0 on Lac !!
873	P-500604	F	+	−	−		−		T
874	P-522826	F	+	−	± ↓su?		−		T
875	P-440777	F	±	±	++		−		T
876	P-407476	F	+	−	−		−		T
877	P-453521	F	+γ	+γ	+γ		−		100 mue
878	P-412280	F	±γ	+γ	+γ		−		60 mue
879	P-522847	F	±	−	−		−	Mal−	60 mue (sm) ±
880	P-525658	F	+	−	−		+++		0, some v. tiny
881	P-190341	F	+	−	−		++ v		T
882	P-414666	F	+	−	−		− v	Lysogenic	T
883	ANL101212	F	+	−	++		−		T
884	P-447944	F	+γ	+γ	++		−		1000
~~885~~	~~P-526955~~	~~F~~	~~+γ~~	~~−γ~~	~~−~~		~~−~~		
886	P-431475	F	+	−	−		−		0

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			Lac	Cb	Ch	Suc	Suc		all Mal+S²
887	191	H.B	±	1	–		–p		O
888	192	"	±		=		–p		O
889	193	"	+		=		+g		O
890	194	"	+		–		+g		O
	1								
891	195	"	+		–		–		O
892	196	"	+		–		–		T
893	197	"	+		–		–		semi T
894	198	"	+		–		–		"
895	199	"	+		–		–		"
896	200	"	+		–		–		"
897	201	"	+		–		–		O
898	202	"	+		–		+g		O
899	203	"	+		–		+g		O
900	204	"	+		–		–		O
901	205	"	+		–		–	Mal±	O
902	206	"	+		–		–p	"	T
903	207	"	+		+u		±p	"	T
904	208	"	+		–		±	"	T
905	209	"	+		–		–p	"	semi T.
906	210	"	+		–		±p	"	T
907	211	"	+		–		±	"	O
908	212	"	+		–		–		O
909	213	"	+		–		–		O
910	214	"	+		–		–		T
911	215	"	+		–		–		T
912	216	"	+		–		–		T
913	217	"	+		+u		±p		T
914	218	"	+		–		±p		T
915	219	"	+		–		–		T
916	220	"	+		–		–		O
917	221	"	+		–		+		O
918	222	"	+		–		–		O
919	223	"	+		+u		+		O

Benham – Chicago 9/26/51 AR

			Lac	Cb	Mal	Suc	Ch fact+	
920	ᵀJones, Mabel	F	+	–	+	±	–	0 0
921	ᵀVinson, Julina	F	+	–		–		0
922	17065	U	+	–		–		0
923	387178	U	+	–		$\pm^{?}$		0
924	ᵀDumkund, Rose	F	+	–		–		
925	ᵀSpanier, Joseph	Left Kidney	+	–		–		0
926	529728	U	+	–		++	–	0
927	45146	Rectal Swab	+	–		–	–	ca 500 +, ± ?
928	ᵀTruitt, Nettie	F	+	–		–	–	0
929	ᵀStennfeld, D.	F	+	–		–	–	0
930	ᵀGroom, Nettie	F	+	–		–	–	0
931	240	U	±	–	–	±	inh ?	0
932	524896	Rectal Swab	+	+	+	++	–	0
933	ᵀMiller, Florence	Lung	+	–	+	–	–	0
~~934~~	~~49949~~	~~U~~						0
935	528839	U	+	–	+	–	–	
~~936~~	~~529638~~	~~U~~						

Miller – U.C.   λ^R

9/27/57

			Lac	Suc	Ck	Cb	Mal	
937	120	H.B.	+ 986	++	−	−	+	0
938	121	H.B.	+ (−)	±	−	−	+	8+
939	122	SPLEEN	+	++	−	−	+	0
940	123	SPLEEN	+	++	−	−	+	0
941	124	H.B.	+	−	−	−	+	1+
942	125	H.B.	+	−	−	−	+	0
943	126	SPLEEN	+	−	−	−	+	0
944	127	PATIENT WITH URETHRITIS	+	−	−	−	+	1+
945	128	SPLEEN	+	++	+φ	−	+	0
946	129	SPLEEN	+	++	+	−	−m	2 −m
947	130	H.B.	+	++	+φ	−	+	0
948	131	"	+	−	−	−	+	0
949	132	"	+	−	−	−	+	1+
950	133	"	+	−	−	−	+	0
951	134	"	+	−±		−	+	0
952	135	"	+	++		−	+	0
953	136	"	+	−		−	+	0
954	137	"	+ 980	++		−	−m	0
955	138	"	+ (−)	±		−	+	0
956	139	"	+	[illegible]		−	+	0
957	140	"	+	−		−	+	ca 12 variable; satellite
958	141	"	+	−		−	+	0
959	142	"	+	−		−	+	0
960	143	"	+	−		−	+	0
961	144	"	+	−		−	+m	T
slant (962)	145	"	±	++		−	−m	semi T_2 (many +, −)
963	146	SPLEEN	−	±		+	+ SR	—
964	147	"	−	−		±	+	T
965	148	"	−	+		±	+ SR	—
966	149	"	±	−		−	+	T
967	150	"	(± slow)	±		±	+	0

962 Lac+ ok, Mal− mut. Save for retest. Colonies on EMS sm n.g. on transfer.

Benham - Chicago

			Lac	Clr	Clr	Suc	Mal	EMS Mal sm
968	T	CARTER, EDITH	U	+	−	−	−	+	0
969	T	CROWLEY, ERRON	RT. EAR	+	++	−	+♂	+	0
970	T	MCKINNEY, ELIZ.	F	+	+ mix?	−	−	+	0
971	T	BOSSI, CHARLOTTE	F	−	−	−	−		0
972	T	MENAGHO, RUTH	F	+	−	−	−		0
973	T	FOWLER, HATTIE	U	+♂	+♂	−	+♂		0
974	T	QUINN, JENNIE	F	+	−	−	−		0
975	T	MILLER, HAZEL	F	+	−	−	+		0
976	T	STINE, ALPHA	F	+	−	−	−		0
977	T	SMALL, SANDRA	U	+♀	+♀	−	+♂		0
978	T	WALRORK, GWEN	F	+	−	+	[illegible] P		1+
979	T	CHRISTOPHER, J.	WOUND	+ P	−	−	++	Mal+	4+ 3g.
980		~~9461~~ 955-		−	−	−	±		0
981	T	MCHARY, LOVET	Sp. FLUID	+	−	−	−		0
982	T	O'NEIL, IRENE	F	−	−	−	+		0
983	T	SMITH, MARY	F	+	−	−	−		3+
984	T	MURRAY, L.V.	LUNG	+	−	−	−		0
985	T	REISCH, CAROLINE	F	+	−	−	−		T
986		938 -		−	−	−	−		T

Benham – Chicago 9/30/51

				LAC	Cb	Clr	Suc	Mal	S	λ R	
987	SHANAFELT, D.	Ischial abscess		+	−	±	−				0
988	GANSORT, A.	U		±g	+g	−	+g				0
989	BIRRIAND, M.	F		+	−	−	−				0
990	NORMANT, A.	Rt. Eye		+	−	−	−				0
991	SKINNEY, M.	U		−	+	−	+				4+
992	FORTNER, M.	Throat		+	−	−	−				2+
993	MARTIN, V.	Pancreas		+	−+	−	−+				2+
994	ISHMIAL, D.	Wound		+	−	−	−				T
995	SMITH, STEPH.	Tracheotomy		±g	+g	−	+gp				T
996	WILLIAMS, N.	Lochia		+	−	−	−				0
997	HENLEY, D.	Peritoneum		+	−	±	−				0
998	CHRISTOPHERSEN, E.	Penis		+	−	−	−				0
999	McMIKEL, M.	U		±g	+	−	+g				0
1000	YORK, DEROT.	F		+	−	−	−				0
1001	JORDAN, DWIGHT	F		+	−	−	−				0
1002	HAND, WILLIE	U		−	−	+φ	−	Mal ±	S S		Lysogenic.
1003	THOMPSON, A	U		(+)g	+g	−	+g	S R			
1004	CORRIGAN, J.	U		+	−+	−	+p				T
1005	DIBENETTO, T.	U		+g	−	−	−				ca 800 +g
1006	SAFFE, M.	U		+	−	−	−				0
8-21-51 1007	LN 101206	F		+g	+	−	+g+		S		0
1008	LN 101379			+	−	+	− +		S		0
1009	12-993	F		−	+	−	− ±		R? [redacted]		T [redacted]
1010	187447	F		−	−	−	− ±		S [redacted]		0

PDS

Retests of colicin-producing strains

8/26/51

776-	Test of colicin activity vs. 518	vs. W1695	X W1695 on EMS-lac-Sm	mal
25	++	—	0	
53	—	—	0	
56	+	—	(+ (slow)	
61	++	—	0	
62	—	—	5+	5+
65B	—	—	0	
70	—	—	T	
75	—	—	0	
90	—	—	0	
93	+	+	1+	1+
95	+	+	11 (slow)	
750	+	+	2+	2+
753	+	—	0	
850	++	—	0	
903	—	—	0	
913	—	—	4+(slow)	
919	—	—	0	
945	+	+	—	
946	+	+	0	
947	+	—	3+	3+
978	++	—	0	
987	—	—	—	
1002	—	—	—	
1008	++	—	0	
1013	+	+	—	
1016	+	+	0	
1017	+	+	0	
1018	+	—	T	
1028	+	—	1	1+
1036	++		0	

October 14, 1951.
Other testers.

A. W1490 — B M Lac+ Mal+.
B W1602 — B M -Lac- Mal-
C W1611 — wg 4

				A		1052A A	C
A.'	#1052 =	W1754 wg 3½ Mal-		++	-	~~++ mostly~~ ~~- small~~	~~Lac+, -~~ Ca 30 all Lac-
	1053	1755	+	++	-	~~Ca 30+~~	mostly Mal+, 1-
Mal (-)	1055	1756	-	50	-	8 v. sm.	70 sm
	1056			+	-	5+	0 Lac+
	1060	1757	+	+	-	5+	3+ Lac+
	1063	1758	-	+	=	0	0
?	1072						

Lac, Mal ± and (1052A)

		B	C		B	C	
B'. +	W1113	+	+	-	-0	1+	
C.	W1115	+	+		++ mostly Mal Lac	0	~~none~~ !
/	776-1054	•	0				
	1057	11	0		2+	1-	Lac+
	1058	●	0				
	1059	ō	ō				
	1061	0	0				
	1062	0	0				
	1064	+	0		2+	~~A?~~	Lac+
	1065	0	0				
	1066	0	0				
	1067	0	0				
	1068	+	0		7+	~~A?~~	Lac-? Lac+.
	1069	0	0				
	1070	0	0				
	1071	0	0				

Note 1053 is seen to be fertile with wg 4 as well as wg 1

But note W1115 x wg 4 apparently sterile. But 1113 gave only! not enough

Also confirms 1052-3-5-6- 1060. ??

Review 1052A: gives Lac- and Lac+ (~~M~~ N) - x W1611

Repeat 1053 x W1490: 29 colonies, all Mal+ Note: Mal- was seen in x W1611

Catlin – Marquette – 8-17-51 all λR

		Lac	Cb	Sme	Ck	Mal	S	EMS Mal Sm	Lac-Sm	
1011	23a	+		−	+	+	S	0		
1012	26f	+		−	−	+	s	0		
1013	31b	+		+	+	+	s	0		
1014	35a	+		+	±	+	s	18+	18+	
1015	38a	+		+	−	+	s	0		
1016	44a	+		+	+	+	s	0		
1017	45a	+		+	+	+	s	0		
1018	46d	+		± + −	++	+	R?	T		
MISS. 1019	51c	+		+		+				
MISS. 1020	55a	+		+		+				
1021	57b	+		+	−	+	s R?	0		
1022	58b	+		−	−	+	s R?	0		
1023	59a	+		+	−	+	s R?	0		
1024	64c	+		+ −	−	+	s	0		
1025	66a	+		+	−	+	s	0		
1026	69b	+		−	−	+	s	1+	1+, 1dg	
1027	73a	+		−	−	+	s	0		
1028	74c	+		+	+	+	s	2+	2+	
1029	75a	+		+	−	+	s	0		
1030	86a	+		±	−	+	s	2−	2dg	
1031	89a	+		+	−	+	s	0		
1032	90b	+		+	−	+	s	0		
1033	91a	+		−	−	+	s?	0		
1034	94a	+		−	−	+	?	110+	dg	
1035	95a	+		+	−	+	?	11+ slow	dg	
1036	96a	+		−	++	+	s	0		
1037	102c	+		+	−	+	s	2+ ?		
1038	103a	+		+	−	+	s	0		
1039	106a	+		−	−	+	s	0		
1040	107b	+		±	−	+	s	0		
1041	108a *	+		+	±	−	s	0		
1042	109a	+		+	−	+	s	0		
1043	110a	+		−	−	+	s	0		
1044	111b	+		+	−	+		T		
1045	112a	+		−	−	+	s	0		
1046	113a	+		±	±	−	s	40+	10+	
1047	114c	±		−	±	+	s	0		
1048	115b	+		−	−	−	s	0		
1049	116a	+		−	−	+	s	1+	1+	
1050	118a *	+		−	−	−	s	0		
							Suc			
1051	119a	+ (± dto)	−			−	−	W1710 1−	1+?	Both Lac− Mal−
1052	121a		÷			−	−	W1754 0		Later: Fertile
1053	124a		−			+	−	Lac ±+ W1755 0		Fertile
1054	125b		−			+	+	0		
1055	127a		−			−	−	W1766 2− tiny		Fertile
1056	129d		−			+	−	1+, 1±?		→ 1Lac+Mal+ ; 1Lac−Mal−.
1057	131a		−			+	+	1+		
1058	132a		−			+	+	2+		?
1059	133a		+			+	+	T		
1060	135b		−			+	−	W1751 0		Fertile

dg = didn't grow, prob. marginally resist to Sm.

Catlin - Marquette - 8-17-51

		Lac	Glr	SucCh	Mal	EMS Mal sen	
1061	138a	+	−	−	+	4+	
1062	140a		−	−	+	0	
1063	143a *		+	+✓	−/+	0 W1758	Pen: Mal−
1064	145a		−	−	+	0	?
1065	146b		−	−	+	0	
1066	147a		−	−	+	0	
1067	150a		−	−	+	3± tiny	
1068	151b		−	−	+	0	?
1069	153b		−	−	+	0	
1070	154c		−	−	+	2- tiny	
1071	155b		−	−	+	0	
1072	157a		−	−	−	0	v. quick
1073	158a		+	±	+	0	
(1074)	161a		−	+✓	+	1-?	
1075	162a		−	−	+	0	
1076	163a		−	−	+	0	
1077	164a		−	−	+	0	
1078	165a		−	−	+	0	
1079	168a		−	−	+	1-?	
(1080)	169c		−	±δ ✓	+	1+	
1081	170c	✓	−	±δ	+	1-? 2+? : 2 Lac- Mal- (blue); 1 Lac- Mal- light	
1082	171b		−	− ↓	+	4+	
1083	172b		−	−	+	0	
1084	173a		−	+	+	0	
1085	174a		−	−	+	4+	
1086	175b		−	−	+	0	
1087	176a		−	−	+	2+	
1088	177a	↓	−	±δ	+	0	

1051: mixed: Lac+,− Mal−. A = Lac+ (not pure 1st isol.)
B = Lac− (unstable?)

Recheck 1051, 1081. 1051 shows 2 components on Lac. (see over)

10/5/51.

1051A is unstable lac+.
Each of 4 "clean" colonies showed lac- components.

UV (10-12 sec for 10-6 surv.) increased proportion of lac-sectored colonies but left mostly lac+.

1051C = Stable Lac+ from B.

Check through SR mutation.

776 - 1051 = W1710. Possibility of segregation not ruled out.

Check Photography

Retests:

1051 A	3 Lac+ Mal- Xyl- MtlΞ	≠ But Par. is Lac ±, Mal- Xyl- !
B	1 Lac- Mal- Xyl- MtlΞ	
	1 + +	
1056	1 - -	
1081	1 Lac+ Mal+ Xyl+ Mtl+	✓
	1 Lac- Mal- Xyl- Mtl-	

PDS. checked W1710 lac- × W1490 : very high yield
W1394 : " low or 0.
10/10/51

Bentham - Chicago 8-21-51 λ

			Lac	Cb	Suc Ck	Mal sme
1089	383857-P	F	+g	+		1+ gummy
1090	366548-P	F	+	−		0
1091	437817	abscess	+	−		0
1092	443915-P	F	+	−		0
1093	482333	U	±	−		0
1094	502080-P	F	±g	+		0
1095	516884-P	F	+	−		0
1096	P-522824	F	+	−		0
1097	528879	U	+	−		1+
1098	528964	U	−	−		0
1099	529857-P	F	+	−		0
1100	63416	abdominal pus	+	−		0

U. W. − P. H. L. 8-21-51

1101	74251	+g	+		0
1102	74252	+g	+		0
1103	74254	+g spreader			
1104	74257	+	−		0
1105	74335	+	±		
1106	74336	+(faded)	±		
1107	74351	+	−		
1108	74354	(+), −	−		0
1109	74522	+	−		
1110	74761	+g	+		
1111	74763	+(faded)	+		
1112	75243	+	−		
1113	75789	+g	+		
1114	75791	+	−		
1115	75819	+	−		
1116	75820	+	+		
1117	75860	+	−		
1118	75916	+	−		
1119	76201	+g	+		
1120	76202	±	+		
1121	76209	+g	+		
1122	76307	+g	+		
1123	76308	+	−		
1124	lac-fr. 1108	−	+		0

776 UW PH Lab. 9/14/51

		Lac	Cb.	Suc	Ck	Mal	S
1125	—	+	−				
6	78961	+	−				
7	80807	+	−				
8	—	+	−				
9	78349	+	−				
1130	78389	+	−				
1	80742	+	−				
2	78390	+	+				
3	78522	+	−				
4	78960	+	−				
1135	80015	+	−				
6	83552	+	−				
7	78344	+	−				
8	79267	+	−				
9	78953	+	−				
1140	78753	+	−				
1	79125	+					
2	79545	+	−				
3	79562	+	+				
4	79361	+					
1145	79816	+?	−				
6	85133	+	+				
7	Lac-fr.1133	−	−				
8	78952	+?	−				
9	Lac-fr.1156	−	−				
1150	Lac-fr.1126	−	−				
1	Lac-fr.1127	−					
2	77547	+	−				
3	Lac-fr.1138	−	−				
4	77872	+	−				
1155	77546	+	+				
6	79696	+	−				
7	79264	+	−				
8	79180	+					
9	Lac-fr.1141	−	−				
1160	Lac.-fr.1144	−	−				

All S R

U of Chi Burham

No.	Specimen	Source	lac	Ct	Suc	CK	Mal	Sm	EMS mal sm	
1161	519345	Ur	+	+	+g	−	+	R?	x	
1162	520214	Abd Inc.	+	+	+g	−	+	R?	x	
1163	T ~~[illegible]~~ 1595	F	+	−	+	+'	+	R?	x	
1164	P428740·14546	F	+g	+	+g	−	+	S	1+g	
1165	303404	U	+	−	−	+	+	S	0	
1166	532475	U	+	−	−	−	+	R	x	
1167	P410798·1425	F	+	± (	),+g	−	+	S	0	
1168	360353	U	+	−	−	−	+	S	0	
1169	T602	Halp. Bl.	+	−	−	−	+ —	R	x	
1170	465546	U	+	−	−	−	+	S	0	
1171	299828	U		−						
1172	B3192	Ab	+	−	−	+	+		0	
1173	P501503·1683	F	+	−	−	−	+		0	
1174	239457	U	−	−	±g	−	+		0	
1175	P531933·1649	F	+	−	−	−	+		0	
1176	P443661·1703	F	+	−	−	+	+	S	1+	
1177	531369	U	+	−	−	+	+	S	0	
1178	532439	U	+	−	−	+	+	S	0	
1179	200517	U		−						
1180	530836	Sinus	−	−	−	−	−	S,	0	
1181	T1260 · Bellamy	F	+	−	−	−	+	R?	x	
1182	T1287	F	+	−	−	+	+		0	
1183	T1398	U	+g	+	+g	−	+	S	0	
1184	T516	F	+	−	−	+	+	P	x	
1185	T921	F	+	−	−	±	+	S	0	
1186	P527128	F	+	−	−	+'	+	S	0	
1187	T807	F	+	−	−	−	+	P	x	
wg 27 1188	T1205	U	+	−	+	±	+	S	6−	→ Mal-X+ ✓
1189	T1258	U	±g	−	−	±	+	S?	0	
1190	T1681	liver abscess	+	−	−	++	+	S	0	
1191	T436	F	+	−	−	−	+	S	1+	→ lac+
1192	T662	F	+	−	−	±	+	S	0	
1193	T1521	U	+	−	−?	[illegible]	+	S	0	
1194	T1289	U	+	−	−	++	+	S	0	
1195	T605	Vag.	±g	−	±g	+	+	S	0	
1196	T805	F	−	−	−	−	+	S	0	
1197	T1517	U	−	−	−	++	+	S	0	
1198	T1676	F	+	−	+	−	+	S	0	
1199	T582	F	+	−	−	+	+	S	2+	→ lac+
1200	T447	U	+	−	−	+++	+	S	0	
1201	T1513	Bld	+	−	−	++	+	S	0	
1202	T938	lymph node	+	−	−	−	+	S	0	
1203	T855	?	+	−	+	−	+	S	0	
1204	P530163·1738	F	+	−	+	−	+	S	0	
1205	T569	bile	+	±	+	−	+	S	0	
1206	T704	F	+	−	+g	−	+	S	1+	lac+
1207	T917	throat	+	−	−	±	+	S	1+	lac+
1208	T526	U	+g m	+	+g	−	+	R		
1209	T529	F	+	−	−	+'	+	S	0	
1210	P101755	F	+	−	−	+	+	S	0	
1211	T1793	U	+g	+g	g	−	+	S	0	
1212	T1378	sputum	+	+	±	−	+	S	0	
1213	T1606	F	+g	+	+	−	+	S	0	

1194 may be susceptible to CK from 1195

U. of Chi. — Benham

			lac	Cb	Suc	CK.	Mel	Sm	EMS mal Sm	
1214	P532411-1709	F	+	−	−	−	+	S	1+	lac+
1215	T1603	F	+	−	+	−	+	S	1+	lac+
1216	T927	Bld, post mort	−	−	±g (poor growth)	−	+	S	0	
1217	T1785	U	±g	+	+g	−	+	R		
1218	T523	F	+	−	−g	−	+	S	0	
1219	lac− fr 1208		−	−	−	−	−	R		
1220	lac− fr 1215		−	−	+	−	+	S	0	

Starr - California

all λR
0 unless otherwise

		lac	Cb	Suc	CK.	Mel	Sm	EMS mal Sm
1221	T56:3g	+	−	±g	++	+	S	1+
1222	T64:3g	+	−	±g	++	↓	↓	
1223	T65:3g	+	−	−?	++	↓	↓	1+
1224	T66:3g	+	−	±?	++	↓	↓	
1225	T69:3g	+	−	−	−	↓	↓	1+
1226	T70:3g	+	−	−	±	↓	↓	
1227	T73:1g	+	−	−	+	↓	↓	
1228	T74:1g	−	+	+g	−	↓	↓	1+
1229	T75:1g	+	−	±	+++	↓	↓	
1230	T76:3g	+	−	±	−	↓		
1231	T77:1g	+	−	±	+++	↓	P	
1232	T78:3g	+	−	−	±	↓	S	
1233	T81:3g	+	−	+	−	↓	R	
1234	T86:3g	Spreader						
1235	T131	Spreader						
1236	T146:10g	+	−	−	−	↓	S	
1237	T152:10g	+	−	±	−	↓	↓	
1238	T153:10g	+	−	−	−	↓	↓	
1239	T155:3g	+	−	−	−	↓	↓	
1240	T180:3g	+	−	−	−	↓	↓	1+
1241	T181:10g	+	−	−	+	↓	↓	
1242	T182:10g	+	−	−	− [crossed out]	↓	↓	
1243	T256:3g	+	−	−	−	↓	↓	4+
1244	T258:3g	+	−	−	−	↓	↓	
1245	T259:3g	+	−	−	+	↓	↓	1?
1246	T260:3g	+	−	−	[crossed out]	↓	↓	
1247	T287:3g	+	−	−	−	↓	↓	
1248	T288:3g	+	+	−	−	↓	↓	
1249	T289:3g	+	−	−	++²	↓	↓	
1250	T290:3g	+	−	−	++²	↓	↓	(0)
1251	T292:3g	+	−	−	[crossed out]	↓	↓	(0)
1252	T293:3g	±g	+	+g	−	↓	↓	0
1253	T294:3g	+	−	−	++²	↓	↓	
1254	T295:	+	−	−	++²	↓	↓	
1255	T297:3g	+	−	−	++²	↓	↓	
1256	T298:3g	+	−	−	++²	↓	↓	
1257	T299:3g	+	−	−	++²	↓	↓	
1258	T300:3g	+	−	−	++²	↓	↓	
1259	T301:3g	+	−	−	++²	↓	↓	
1260	T304:3g	+	−	−	++²	↓	↓	
1261	T306:3g	+	−	+	++²	+	↓	
1262	T383:1g	+	−	−	+	+	↓	1+

	UW PH lab		lac	Cb	Suc Ck	Mal	sm		
1263	86518		+	—	±	+		1+	
1264	86978		+	—	±	+		1+	
1265	86981		+	—	±	+			
1266	87328		+	—	—	+			
1267	88410		+g	—	—	+		2+	
1268	89456		+	—	—	+			
1269	90184		+g	+g	—	+	R		
1270	90204		+	—	—	+		3?	
1271	90296		+	—	—	+			
1272	90297		+	—	—	+			
1273	91479		+	—	—	+			
1274	91715		+	—	—	+			
1275	92086		+	—	++ v.sharp.	+			
1276	lac - fr 1267		—	—	—	—	R	T	pigmented?

776 RESUME
August 5, 1952.

These cultures have been retained on slants for further test.

W	776		S/Mal sm × 1177	× 1177F+	× other testers
1362			22 lac+. Dimorphemenated: lac, SS.		
a b	sucr-				
1547	266	Stuart W1 lac-Mal+	1-✓ 1-	1--✓	Reducible lac mutation
1755	1053	Mal+ lac±+			Mal- ×1611 ?
1756	1055	Mal-	?		
1757	1060	Mal+		+	
1763	1246	Clifton K201	--, o		
1764	1281	Clifton K93	2- >100+?; all+		
	95	lac+Mal+	1-; ?xx.		
	232	lac-m Mal-m	16? sev?	5+	
	731	lac+, Mal±	(100+,-)(T); [1-?]	small lac-mal-). "utter confusion. Mal-lac- on control!	
	1390		3+ 11-; 1--✓	0, 0,	
	1413 1414		several hundred + and -;	0,0	Later, 0 F+, F-.
	1507	++	1+, 6-; 9-?	2-+? . PARENT MOTTLED	
	1545	++	2+ 7-;	3+, 10+.	
	1554	L+M-	60--, 0,0	0	
	1560	± -?	60+ 3-) all lac+,	2+ 1- (small) 1602	
	1575	++	many --, 0,	small ++	
	1578	++	3+ 4- } L+ 0	0,0	
	1605	++'	many - (L +, -); 0 0	0	
	1608	++	17-20+; 0, 0	0	
	1622	++	3+ 6- (4 neg) 20+-	1602: 18+ 4-?	
	1623	++	1+ 1--	1-	
	1638	++	100+, 1 control T cross +,-?	0	
	1663	++	25+ 5-, 2+, 1+,	3+ 1602	
	1680	++	100-, 100+ on X + control		
	1689	++	18+, 4-, 1-sm;	13+, 20- c 1817	

1693 ++ 37+ 3 - ; 3+ 1 - small ; 2+, 5 - x 1817

1699 1 - 1602 2 -

---

776 -

Vials.

Also saved in vials and slants

slants

1186	1302		2	722
89	1303		7	724
90	1304		11	804
91	1305		14	810
98	11		17	843
1200	14		20	962
01	15		21	1057
08	16		27	1074
09	17		53	1080
10	18		56	1328
15	19		58	1454
16	20		61	1574
17	83		62	1620
18	84		93	1621
20	85		144	1641
21	86		153	1681
22	87		208	1692
23	88		440	1694
29	89		644	1701
30	91		658	1731
32	92		661	1738
37	93		671	
38	94		690	
39	95		694	
40	96			
46	97			
47	99			
49	1400	1421		
50	01	22		
	02	23		
	03	24		
	04			
	05			
	06			
	07			
	08			
	09			
	10			
	11			
	16			
	18			
	19			
	20			

W1611

SRP crosses: (Wg 4) × wgs 1—30.

W1611 (S^R lac⁻ auxo) × wg n (S^S lac⁺ proto)

11/6/52 Grew parents together in 5 cc for a day, centrif, washed mco + plated on Ems-lac-Sm. One plate per cross. No control plates studied simultaneously. Pool washing (probably) accounts for skressing turbidity on some of plates at 72 hrs (when all were scanned). The large #'s of large colonies appear on such plates, then, many or may not be prototrophs.

Wg	# colonies lac±	Turbidity
1	40+	—
2	0	—
3	0	—
4	0	—
5	200+	+++
6	28+	—
7	200+	+++
8	0	++
9	0	—
10	0	—
11	0	—
12	1+, 1-	+
13	0	—
14	0	—
15	2+	—
16	0	+
17	0	—
18	0	+
19	0	—
20	0	—
21	400	—
22	0	—
23	0	—
24	100	+++
25	0	—
26	0	—
27	0	—
28	300	+++
29	4+	—
30	3+	—

WG serotypes.

O K H

	Kauffmann type	Orskov	Ewing	EML	Shaer	
1		K30? x				new H ;
2		+ 77				
3	8	0 8 0				-073
4	25	0 25 0				
5	—					citrate +
6	—					citrate +
7		2				
8	—					citrate +
9		0 12				
10		0 x				
11		0		15	1,12	
12						
13					13	
14						
15	86	12		81		
16						
17	41	0				
18		0				
19						
20					4	
21						
22						
23						
24	40	13				
25					4	
26	1	12			1	
27		0				
28	x	19				
29						
30					27	
28A	19,33	0				
31		0				
32						
33	21	4		21	4	
34						
35		+		21		
36				9		
37	4	5		4		
38		0				
39	4	5		4		= 37?
40	7	0		7		
41				77		
42						
43	21	0 ?				
44						
45						
46	76	7		76	7	
47	X	new		3	13	
48	81	27		81		
49		0				
50		0				

x = rough

K	Φ	· Ew	EML	PDS	
51		x			
52	18 76 14	✓			
53	20 17 0	✓			K76 = 1320
54	21 20 0	✓			
55	25 19 12	—			
56	026 36 0			026	
57	025				probably duplicate of ug 55

	A	B	C	D
1	1	1	1	2
2	2	2	2	3
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	5	5	5	5
7	5	5	5	5
8	5	5	5	6
9	6	6	6	6
10	6	7	7	7
11	7	8	8	8
12	8	8	9	9
13	9	9	9	10
14	10	10	10	10
15	11	11	11	11
16	12	12	12	12
17	12	12	13	13
18	13	13	13	14
19	14	14	14	15
20	15	P1	P1	P1
21	P1	P1	P1	P1
22	P1	P1	P1	P1
23			C	C
24	C	C	C	C
25	C	C	C	C

ANTI-WG SERA
1-3 = WG 3
4-6 = 4
7 = 16
8 = 24
9 = 2
10 = 26
11 = 15
12 = 19
13 = 11
14 = 1
15 = 5

ANTI-PHAGE SERA
P1 = λ_2

RABBIT CONTAGEMENT

GENETICS FREEZER
(LOWER LEFT CORNER)

	A	B	C	D
	1C	2C	3C	4C
	5C	6C	7C	8C
	9C	10C	11C	12C(a)
	12C(b)	13C	14C	15C
	IC	IIC	IIIC	S1C
	S2C	S3C	S4C	S5C
	S6C	S7C	S8C	S9C
	S10C	P1C	P2C	
	1P	2P	3P	4P
	5P	6P	8P	9P
	9P	10P	11P	12P
	I			
		S1P	S2P	S2
	S2	S2	S3P	S4P
	S4	S4	S4	S5P
	S5	S5	S5	S6P
	S6	S6	S6	S7
	S7	S7	S7	S7
	S8	S8	S9	S10
	S10	S10	S10	S10

CONTROL SERA (NON-IMMUNE)

POOLED + HEMOLYSED SERA (COLI)

SALMONELLA SERA

S1-6 = d
S7, S8 = 1, 2, 3
S9, S10 = i

STOCK PAVILION FREEZER
(NEAR RIGHT)

ANTISERA IN STORAGE

Ink entries = 5-10 cc quantities
Pencil entries = 1-2 cc "

Prefixes: P = phage
S = Salmonella
none = coli

Suffixes: C = control
P = Pooled trial bleeding

Titers

S7 = 1/2560 (slide agg)
S10 = 1/320 (")
S1-6 = > 1/20,480.

2/2 – 2/13/53 *E. coli typing via Kauffman - Ewing*

SEROTYPE | Agglut. tests.

K12	H*	O	K
wg/1	+	−	−
11	−	−	x
12	.		
13	FG pool		
14	.		K119?
15	+1,12		
16	AC pool		
17			
18			
19	H+		K19?
20	+7		
21	~~AC~~ pool		
22	.		x
23	+		
24	+4		
25	.		
26	+1		
27	.		
28	.		
29	FG pool		
30	+27		
31		− [illegible]	−
32			
33	+4?	O21	5,9,24 K 28
34			
35	(E) pool		
36		O9	55,9,26,32
37	+26(14)	O4,18	K3
38			
39	+	O4 (18)	K12 → bad tract!
40	+	O7	

	H	O	K
wg/41	pool(G)	O77	3!
42			
43	+4	ck.	
44	*26 (21?)		
45	+	O77	
46	+7?	O76	+
47	+13	.	3(23)
48	(F) pool	O81	x
49			
50			
3	−	O8	+
4	−	group C N(K)	
B	−	−	−

legend
H+ swarm but not agglut.
x tried but neg.
* from swarms at 37°
( ) slight, secondary agglut.

	H	O	K
2		17	
3		8	
4		25	
5		−	
6		−	
7		2	
8		−	
9		12	
10		8	
11	15	15 16	

Ewing [illegible]

no agg. titers determined

33 H
124 O } types known.
60 K

Fertile KK cultures

DATE: 2/5-0

REF:

KK	Mal[1]	Loc[2]	SM[3]	vs 2279[4]	T[5]	T[6]	T[7]	8	9	10
8	+ (2 types)	+	S	–	R	R	R			
19	+	+	S	–						
26	+ (2 types)	+	S	–						
27	+	+	S	–						
31	+	+	S	–						
33	+	+ 8	S	–						
35	+	+	S	–						
36	+	+	S	–						
38	+ (2 types)	+	S	–						
3910	+	+	S	–						
54	+ (2 types)	+	S	–						
57	+	+	S	CK (no ϕ)						

SRP tests of KK cultures
= Ewing's K serotypes of EML505 ✓

ϕ = possible phage lysis

Each tested against W1177 (F-) and W1817 (F+) on EMS mal. + o - refer to mal reaction

KK #	First trial	Second trial	Comment
1	no SRPs (0)		
2	no SRPs (0)		
3	1 mal- c̄ 1817	0	
4	no SRPs (0)		
5	no SRP's; confluent mal + on control plate		
6	no SRP's; 4 + on control plate		
7	0		
8	c̄ 1817, ca 150 protos, + & -. Many mal + on control, 0 c̄ 1177	c̄ 1817 ca 200, + & -	Appears to be fertile, F -
9	0		
10	ca 100 col, + & -, on control & c̄ 1177; 1 + c̄ 1817	c̄ 1817, 1 -	
11	4 + c̄ 1817	c̄ 1817, 1 -	
12	0		
13	0		
14	0		
15	Control 1 + ; 1177 0; 1817 10 +, 8 -	control 1 +, 1 - 1177 0 1817 2 +, 2 -	
16	+ & - on all plates	ca 20-30 col, +, -, on all plates	KK culture found to be mixed c̄ regard to mal
17	c̄ 1817, ca 60 col, +, -, v		
18	c̄ 1817, 1 +, 1 -	c̄ 1817, 2 +	
19	c̄ 1817, ca 100, + & - ϕ		Appears to be fertile, F -
20	c̄ 1817, 3 +, 6 -	0	
21	0		
22	c̄ 1817, 1 +, 16 -, 1 v		
23	0		
24	0		
25	control, 1 ? 1817, 12 v (?)	0	
26	control, 1 - (?) 1817, ca 250, +, -, v. ϕ	1817 ca 200, +, -, v ϕ	Appears to be fertile, F -

SRP tests of KK cultures

KK #	First trial	Second trial	Comment
27	control 1+ ϕ 1817 ca 600, +, −, V		Appears to be fertile, F−
28	1817 1−	1177 1+ 1817 ca 200, all mal −	?
29	0		
30	0		
31	ϕ 1817 ca 100, +, −, V		Appears to be fertile, F−
32	0		
33	1817 ca 50, + & −		Appears to be fertile, F−
34	0		
35	1817 11 slow gummy, ϕ ca 200 −		Appears to be fertile, F−
36	1817 ca 500, + & −		Appears to be fertile, F−
37	1817 1+	1817 1+	
38	1817 ca 150, + & − ϕ		Appears to be fertile, F−
39	1817 ca 1000, + & − ϕ		Appears to be fertile, F−
40	1817 ca 50, + & −		Appears to be fertile, F−
41	control 2+		
42	0		
43	Control, smear, + & − 1177 11+ 1817 ca 150, + & − ϕ	Control: several very small − 1177: 3 mal + or V 1817 ca 200, +, −, V ϕ	Probably fertile
44	0		
45	0		
46	0		
47	0		
48	1817, 2+, 7−		
49	1817 2+	0	
50	1817 1+	0	
51	0		
52	1817 1+, 1−	0	

SRP tests of KK cultures

KK #	First trial	Second trial	Comment
53	0		
54	1817, ca 200, + & −		Appears to be fertile, F −
55	control 1 −	control 1 + & sl	Probably fertile
	1817 6 +, 4 −	1177 0	
	1177 6 +	1817 ca 100 −	
56	1817 12 +	0	
57	1817 ca 200 +, 10 −		Appears to be fertile, F −
58	Control 200 +		
59	1817 1 −	0	
60	0		

			Suc	Mal	x1177	x 1490	x1802	
119a		= 1051 unstable lac+	—	—	✓			wg 24
**	115	1048	—	—	0			
	112	1045.	—	+	0			
	124	= 1053 ~~also lac unstable~~ lac± mutabile cells	— —	+	0	✓		
129d		1056	—	+	✓	✓		wg 25
131 a		1057	+	+	0	(1+) 2+1-	?	
170c		1081	±?	+	✓			wg 26
		1074	+	+		1-?		
		1080	±?	+		1+!		

1063 (143a) Same as 055: B5 type

What serological diagnosis on the most types?

1052 121e -(143a) 1063 - inconsistent reactions. Save for retest
Mal- "rough" Lac unstable?

127a

135b

145a

151b

	Clifton	lac	Gb	mal	SM	Suc	CK	λ	EMS and SM			
1277	K 52	+	−	+	S	±	−	R				
1278	K 61	−	−	−	S	−	−	R				
1279	K 63	+	−	+	S	−	±	~~S~~ R				
1280	K 88	+	−	+	S	−	+	~~R~~				
(1281)	K 93	+	−	+	S	+?	−	~~R~~	2−, >100+	✓: all+	W-1764 (pyelitis isol. 1929)	
1282	K 99	+	−	+	S	+?	−	R	2+			
1283	K 108	+	−		S	−	?	R				
1284	K 120	+	−	+	S	+?	±	R				
1285	K 122	+	−	+	S	+?	−	R				
1286	K 130	+	−	+	S	−	−	~~S~~ ~~R~~ S	5−(?)	✓ lac-Mal−	W-1762 (pyelitis, isol. 1929) Wg 30	
1287	K 131	+?	+	+	S	+?	−	R				
1288	K 133	+	−	+	S	−	±	R				
1289	K 135	+	−		S	−	−	R				
1290	K 137	+?	+		S	+?	−	R				
1291	K 142	+	−	+	S	−	±	R				
1292	K 146	+	−	+	S	−	−	R				
1293	K 153	+	−	+	S	− (Lactose?)	−	R	2+			
1294	K 175	+	−	+	S	+	−	S/R	3+			
1295	K 197	+	−		S	−	±	R	1+			
(1296)	K 201	+	−		S	−	−	S/R	2+, 15−	several − ✓ (Schwartzmann)	~~[illegible]~~ fertile?	W176[illegible]

later, W1763 × 1817 → 14+, several hundred − × W1817

W1762 ✓ lac-Mal- SRP recovered in check

W1763 No growth in 1st check 1-7-52 | 12+, no −.

W1764 Excess +,+ (Control?) 1-7-52 | nothing

~~1296, 1281~~

~~[illegible] mixed~~. W1763 on recheck c̄ control, approx. equal no. mal + on cross & control. No −.
W1764 on recheck − ca 500 mal+ on control, confluent growth on cross.

Miller - U. of Chi. 11-30-51

		lac	cb	suc	ck	mel	SM	All λR EMS mel SM	
1297	1	(+), ~~sl+~~	-	-	+	+	S		
1298	2	+	-	-	+	+	S		
1299	3	+	-	-	+	+	S		
1300	4	+	-	-	+	+?	S		
1301	5	+	-	+	-	+	S	1+, 1-	Wg 44
1302	6	+	-	-	+	+?	S		
1303	7	+	-	+	+	+	S		
1304	8	+	-	+	+	+	S		
1305	9	+	-	+	+	+		4+, 2- (?)	
(1306)	10	+	-	-	+	+		2+, 2 sl	3-9-52 cross & control gave = no SRP
1307	11	+	-	+	+	+	S		
1308	12	+	-	-	+	+	S		
1309	13	+	-	-	+	+	S		
1310	14	+	-	-	+	+	S		
1311	15	+	-	+	+°	+	S		
1312	16	+	-	+	±	+	S		
1313	17	+	-	-	+	+	S		Wg 45 (fertile c̄ W1817)
1314	18	+	-	-	+	+	S		
1315	19	+	-	+	+°	+	S		
1316	20	+	-	+	+°	+	S		
1317	21	+	-	+	-	+	S		
1318	22	+	-	+	-	+	S		
1319	23	+	-	-	+	+	S		
1320	24	+	-	-	+	+	S	21+, 1-	
1321	25	+	-	+	+°	+	S	1+	
1322	26	+	-	-	+	+	S		
1323	27	+	-	-	+	+	S		
1324	28	+	-	-	+	+	S		
1325	29	+	-	-	+	+	S		
1326	30	+	-	+	+°	+	S		
1327	31	+	-	-	-	+	S		
sl (1328)	32	+	-	+	+°	+	S	plate crowded, - and sl+	nothing on second or third trials (1-7-52, 3-9-52)
1329	33	+	-	+	-	+	S		
1330	34	(+) ~~sl+~~	-	-	-	+	S		
1331	35	+	-	+	+°	+	S		
1332	36	+	-	+	+	+	S		
1333	37	+	-	+	+	+	S		
1334	38	+	-	+	-	+	S		
1335	39	+	-	-	+	+	S		
1336	40	+	-	-	+	+	S		
1337	41	+	-	+?	-	+?	S	1 sl	
1338	42	+	-	-	-	+	S		
1339	43	+	-	-	-	+	S		
1340	45	sl +	+	-	-	+	S		
1341	46	sl +	+	-	-	+	S		
1342	47	sl +	+	-	-	+	S		
1343	48	sl +	+	-	-	+	S		
1344	49	sl +	+	-	-	+	S		
1345	50	sl +	+	-	-	+	S		
1346	51	sl +	+	-	-	+	S		
1347	52	sl +	+	-	-	+	S		
~~134~~									

Miller, U. of Chi. 11-30-51

		lac	cb	suc	CK	mal	SM
1348	53	sl +	+	−	−	+	S
1349	54	sl +	+	−	−	+	S
1350	55	sl +	+	−	−	+	S
1351	56	sl +	+	−	−	+	S
1352	57	sl +	+	−	−	+	S
1353	58	sl +	+	−	−	+	S
1354	59	sl +	+	−	−	+	S
1355	60	sl +	+	−	−	+	S
1356	61	sl +	+	−	−	+	S
1357	62	sl +	+	−	−	+	S
1358	63	sl +	+	−	−	+	S
1359	64	sl +	+	−	−	+	S
1360	65	sl +	+	−	−	+	S
1361	66	±	+	−	−	+	S
1362	67	sl +	+	−	−	little or no growth	S
1363	68	sl +	+	−	−		S
1364	69	sl +	+	−	−		S
1365	70	sl +	+	−	−		S
1366	71	sl +	+	−	−		S
1367	72	sl +	+	−	−		S
1368	73	sl +	+	−	−	+	S
1369	74	sl +	+	−	−	+	S
1370	75	±	+	−	−	+	S
1371	76	+	−	−	−	+	S
1372	77	+	−	−	−	+	S
1373	78	+	−	−	−	+	S
1374	79	+	−	−	−	+	S
1375	80	sl +	+	−	−	+	S
1376	81	sl +	+	−	−	+	S
1377	82	sl +	+	−	−	+	S
1378	83	sl +	+	−	−	+	S
1379	84	sl +	+	−	−	+	S
1380	85	sl +	+	−	−	+	S
1381	86	sl +	+	−	−	+	S
1382	87	sl +	+	−	−		S

EMS mal SM

0

1396

Benham, Chicago 12-4-51

		lac	cl	suc	ck	mal	SM	EMS and SM
1383	P-2826	+	–	+?	–		S	
1384	97466	+	–	±?	–	·	S	
1385	P-103312	+	–	–	+	+	S	
1386	P-315797	+	–	–	+		S	
1387	P-349584	+	–	±?	+	+	S	
1388	P-395659	+	–	+?	+	+	P	—
1389	409468 U	+	–	+	+	+	S	
d (1390)	P-430208	+	–	–	+	+	S	3+, 11–	and conferm
1391	P-444266	+	–	–	+	+	S	
1392	P.448851	+	–	–	+	+	S	
1393	P-484064	+	–	–	–	+	S	
1394	P-497502 (2)	±	–	±?	–	±?	R	—
1395	P-497502	+	–	+?	+	+?	R	—
1396	P-524147	+	–	+	+	+	S	1+
1397	P-528421	±	+	+?	–	+	S	
1398	P-534103	+	–	–	+	+	S	λs Fertile, F– Wg 47
1399	P-536140	+	–	+	+	+	S	
1400	P-536484	+	–	+	+	+	S	
1401	P-537830 U	+	–	–	–	+	S	
1402	537880 U	+	–	+?	+	+	S	
1403	P-538022	+	–	+?	+	+	S	
1404	538031 U	+	–	–	–	+	S	
1405	P-538241	+	–	–	±	+	S	
1406	P-538268	+	–	–	±	+	S	
1407	593345 wound	+	–	–	+	+	S	fertile c F+ Wg 49
1408	P539686	–	–	–	+	+	S	
1409	Kruse throat	+	–	–	±	+	S	1+
1410	lac d from 1297	d	+	–	–	+	S	
1411	lac d from 1330	d	–	–	–	–	S	

Benham, Chicago 12-6-51

		lac	cl	suc	ck	mal	SM	EMS and SM
1412	18411	+?	+	+?	+	+	S	
d (1413)	P-21664	+	–	–	+	+	S	several hundred, +, –
d (1414)	P-102836	+	–	–	+	+	S	several hundred, +, –
1415	P-440680	+	–	–	+	+	S	fertile c F+; Wg 48
1416	454575 abdom. fluid	+? (1–)	–	+?	+	+	S	
d (1417)	P-503202	+	–	–	+	+	S	ca 100; 2+, 64+, 9– WG 34
1418	P-534617	+?	+	+?	–	+	R	—
1419	535633 peritoneum	+	±	–	+	+	R	—
1420	536603	+	±	–	+	+	S	
d (1421)	P-537686	+	–	–	+	+	S	ca 200, +, +?, – Check purity of parent OK
1422	P-537856	+	–	–	+	+	S	
1423	538263	+	–	–	+	+	S	1+
1424	lac⁻ from 1416	–	–	+?	+	+	S	

See opp. page

Catlin - Marquette

		loc	cello	Suc	CK	mal	SM	SRP	
1425	27c	+g	+	+g	—	+	P		
1426	35b	+	-	+g	—	+	S		
1427	38b	+	-	+g	—	+	P		
1428	38c	+	-	+g	—	+	P		
1429	38d	+	-	+g	-	+	P		
1430	46f	+	-	+	-	+	S	1+, 1- (?)	
1431	51d	+	-	—	+	+	R		
1432	55b	+g	+	+g	-	+	S		
1433	55c	—	+	±g	—	+g	R		
1434	57d	+	-	—	+	+	S		
1435	58d	+	-	+g	—	+	S	[illegible]	
1436	58e	+	-	±g	±	+	S	2+	
1437	58f	+	—	±g	—	+	S		
1438	59b	+	—	+	-	- little gr.	S		
1439	66b	+	+	+	-	+	S		
1440	66c	+	+	+	-	+	S		
1441	66d	+	—	+	—	+	S		
1442	66e	+	+	+	—	+	S	1+	
1443	66f	+	+	+	-	+	S		
1444	69f	+	—	-	±	+	S		
1445	84d	+	—	+	-	+	P		
1446	84b	+	—	+	-	+	P		
1447	84d	+	—	+	-	+	R		
1448	84f	+	—	+	-	+	R		
1449	85d	+	+	+	-	+	S	ca 100 col, all mal +	
1450	85c	+	+	+	-	+	S		
1451	85d	+	+	+	-	+	S		
1452	85e	+	+	+	-	+	S		
sl 1453	86b	+	—	—	+	mixed?	S		
sl 1454	86e	+	—	—	+	mixed?	S		
1455	89b	+	—	+	±	+	S		
1456	89d	+	—	+	±	+	S		
1457	89f	+	—	+	±	+	S		
1458	90f	+	—	+	+	+	S		
1459	90f	+	—	+	+	+	S	9+	
1460	91c	+	—	—	+	+	S		
1461	91d	+	—	-	+	+	S		
1462	91e	+	—	-	+	+	S	4+	
1463	91f	+	-	—	+	+	S	15+	
1464	94b	+	—	+	—	+	S		
1465	94c	sl	+	+	—	+	R		
1466	94d	sl	+	+	—	+	R		
1467	94a	+	—	+	+	+	S		
1468	95b	+	—	—	+	+	S		
1469	95c	+	—	—	+	+	S	ca 50+	
1470	95f	+	—	-	+	+	S	7+	
1471	96b	+	—	-	+	+	S		
1472	96f	+	—	-	+	+	S		
1473	98a	+	—	+	—	+	S		
1474	98b	+	—	+	-	+	S	plate crowded, all +	
1475	98c	+	—	+	—	+	S		
1476	98d	+	—	±	-	+	S	1+	
1477	98e	⊖, *	—	±	-	—	R (pigmented)		
1478	99a	sl, ⊕	—	+	-	+	S	ca 100, ± and - (?)	Questionable - form large, spreading light-colored colonies
1479	99aa	+ //	—	+	—	+	S		

1421 - on rechecking (3-9-52) got approx equal numbers real + imaginaries on unwound contd. two real -.

Catten - Marquette

		lac	cells	Suc	C/K	mal	SM	SRP	
1480	99c	(+g) -	+	+	±	+	S		
1481	99d	+, (+)	+	+	±	+	R		
☆ 1482	99e	+, (-)??	+	+	±	+	S	13+, 1-(?)	☆ see opp. page
1483	100b	sl	+	+	-	+	R		
1484	100ccc	sl	+	+	-	+	R		
1485	101d	sl	+	+g	-	+	R		
1486	101e	sl	+	+g	-	+	R		
1487	101f	sl	+	+g	-	+	R		
1488	102b	sl	+	+g	-	+	R		
1489	102d	sl	+	+g	-	+	R		
1490	102e	sl	+	+g	-	+	R		
1491	102g	+	-	-	+	+	S	ca 200+; several -(?)	
1492	103	+	-	-	+	+	S		
1493	103e	~~sl~~+g	+	+g	-	+	R		
1494	105a	+	-	+	-	+	S	15+, also background of small + colonies	
1495	105b	+	-	+	-	+	S		
1496	105c	+g	+	+	±	+	S		
1497	105d	+	-	+	-	+	S		
1498	105e	(+)+g	-	+	-	+	S	~~4+, 2+(?)~~	
1499	105f	+	-	+	-	+	S		
1500	106b	+, (+)	+	+	-	+	S		
1501	106c	+g	+	+	-	+	S		
1502	106d	+g	+	+	-	+	S	3+, 2-(?)	
1503	106e	+g	+	+	±	+	S		
1504	106f	+g	+	+	±	+	S		W1817 used
1505	107a	+	+	+	-	+	S		
1506	107c	+	-	-	±	+	S	~~1111~~	
SR (1507)	107d	+g	-	-	±	+	S	11+, 6-	
1508	107e	+g	-	-	±	-	S	1-	
1509	108b	+	-	+	-	+	S	turbid	
1510	108c	+	-	+	-	-	S		
1511	108d	+	-	+	-	-	S		
1512	108e	+	-	+	-	-	S		
1513	108f	+	-	+	-	-	S	1-	
1514	109b	+	-	-	±	+	S		
1515	109c	+	-	-	-	+	S	15+	
1516	109d	+	-	-	-	+	S	22+	
1517	109e	+	-	-	-	+	S	6+	
1518	110b	+	±	+	-	+	S		
~~1519~~	~~110c~~	~~no gr.~~							
1520	110d	+	-	+	-	+	S		
1521	110e	+	-	±	+	+	S	4+	
1522	110f	+	-	±	+	+	S		
1523	111a	+	+	±	-	+	S	1+	
← 1524	111c	(-) ~~+S~~	+	-	-	-	R	Though SR, did not grow on S mal SM	
1525	111d	(+) ~~+S~~	±	± impure? (OK)	-	+	P		
1526	111e	-	-	+g	-	+	P	Turbid	
1527	111f	+	-	+	±	+	S P	turbid (shows plaques)	
1528	112b	(+), ~~+R~~	-	-	-	-	S	1-	
1529	112c	(+), -	-	-	-	-	S	1+, 16-	Replicated to S lac SM, 16 lac+, 1 lac- all lac+
1530	112d	(+), -	-	-	-	-	S	6-	
1531	112e	(+), -	-	-	-	-	S		
1532	112f	+	-	-	-	-	S	5-	
1533	113b	+	-	+	±	+	S	5+	
1534	113c	+	-	+	±	+	S	ca 50+	

Margin note beside 1487–1493: transposed?

✱ One culture short between 1526 and 1537; missing culture provisionally assumed to be 1537 (113f)

Catlen - Marquette

		lac	cello	Suc	CK	mal	SM	SRP			
1535	113d	+	−	+s	−	+	S				
1536	113e	+	−	−	−	+	S				
✱ ~~1537~~	~~113f~~										
1538	114d	sl	−	−	−	+	S				
1539	114f	−	−	−	±	+	S				
1540	115c	+	−	−	+	+	S				
1541	115d	+	−	−	−	±s	S				
sl (1542)	115e	−	−	−	+	+	S	4+, 2−	Recheck confirmed fertility (6+, 32−)	WG 33.	
1543	115f	sl	−	−	−	±s	S				
1544	116b	+	−	−	−	+s	S				
(1545)	116c	+	−	−	−	+	S	2+ 7−	9 lac+		
1546	116d	+	−	−	−	+	S	3+			
1547	116e	+	−	−	−	+	S	1+			
1548	116f	+	−	−	−	+	S	7+			
1549	112a	+ascl+	+	+	−	+	S	2+			
1550	117b	+	+	+	−	+	S	1+			
1551	117c	sl+	+	+	−	+	S	.			
(1552)	117f	sl+	+	+	−	−	S	+++ no−			
1553	118b	+	−	+	−	−	S	.			
(1554)	118c	+	−	+	−	−	S	60−	→ all lac−		
1555	118d	+	−	+	−	−	S	.			
1556	118e	+	−	+	−	−	S	.			
1557	118f	+	−	+	−	−	S	.			
1558	119b	+ (sec)	−	−	−	−	S	3 days: 1 Mal+			
1559	119c	+ +/−	−	−	−	+	S	1−	Lac−	ow recheck - control gave ca 200 col; cross - confluent gr.	
(1560)	119d	+/−	−	−	+	·	S	60+ 3−	all lac+		
1561	119e	+/−	−	−	−	+	S	,			
(1562)	119f	(+/−)	+	−	+	+	S	ca 80 +, 8, −	5 lac+ n plate	ow recheck wg 43	control 1 mal+ cross 200 mal+ sel 17+/9
1563	120a	+/−	−	+	−	+	SR				
1564	120b	+/−	−	+	−	+	SR				
1565	120d	+	−	+	−	+	SR				
1566	124c	ng sl	0								
(1567)	125c	+	−	+	−	+	P−	+++ no−	all lac+	Recheck: confluent gr. no cross control	
1568	126b	ng sl	−	S	−	+	S				
1569	127b	+ ng 18hrs	+	+	−	+	SR				
(1570)	127c	+	−	−	−	+	S	+++ no−	all lac+		
1571	127d	+	−	+	−	+	SR	.			
1572	127e	+	−	+	−	+	S	.			
1573	128b	+	−	−	−	+	S	1+			
(1574)	128d	+	−	−	−	+	S	3 mag 3-2+			
(1575)	129a	+	−	+	−	+	S	+++ all−	→ all lac−		
1676	129c	+	−	+	−	+	S	.			
1577	129a	+	−	+	−	+	S	18+	18 lac+		
(1578)	129f	+	−	+	−	+	S	3+ 1−	all lac+		
1579	130b	sl	+	+	−	+	S	.			
1580	130c	sl	+	s	−	+	R				
1581	130d	sl	+	s	−	+	R/S				
1582	130e	+	+	+	−	+					
1583	131b	+	−	+	−	+	S				
1584	131f	ng. −	0 ±	±	−	±	P				
1585	132b	+ ng	−	+	−	+s	S	0			
1586	132c	(+) +s	+	+s	−	+s	S	2+			
1587	132d	+ ng	−	+	−	+s	S	0			
1588	132e	+ ng	−	−	−	±s	S	0			
1589	133b	n.g.									

3 components from 1482 all three cells +

1482 a : lac +, small colonies

1482 b : lac +, large colonies

1482 c : lac +, extremely gummy

1524 pinpoint colonies - may be +, but too small to tell.

Catlin - Marquette

			lac	cello	suc	CK	mal	SM	SRP
	1590	133c	−	±	±	−	+	R	
	1591	133d	+	+	+	−	+	R	
	1592	133e	+ mu	+	+	−	+	R	
	1593	133f	±	±	±	−	+	R	
	1594	135a	(+) +sl	+	+g	−	+g	R	
	1595	135c	(+)	+	+g	−	+g	R	
	1596	135d	(+), +sl	+	+g	−	+g	R	
	1597	135e	(+), +sl	+	+g	−	+g	R	
	1598	135f	+	+	+g	−	+g	R	
	1599	137a	+g mu	+	+g	−	+g	S	0
	1600	138d	+ mu	−	−	−	+	S	1
	1601	139a	+g	+	+g	−	+g	S	1 muc
	1602	140b	+	+	−	±	+g	S	0
	1603	140c	+ mu	+	−	±	+g	S	1− lac+
	1604	140d	+ mu	+	+g	++	+g	S	0
sl	(1605)	140e	+ mu	+	±g	±	+g	S	++/−? Appear lac+ & lac− on replica to S lac SM too crowded to be sure; repeat c̄ control
	1606	140f	+ mu	+	±g	−	+g	S	1− lac− (?)
	1607	140g	+ mu	+	±g	−	+g	S	0
sl	(1608)	140h	+ mu	+	±g	−	+g	S	17−/20+ about same proportion lac−/lac+
	1609	141a	+g	−	±g	−	+	S	1+
	1610	142a	±g	−	+g	−	+	S	1 muc
	1611	142b	+g	+	+g	−	+	S	3− 1−; others n.g.
	(1612)	142e	±g	+	+g	−	+	S	30+ all lac+
	1613	143b	+	−	+	−	{very little growth}	S	0
	1614	143c	+ mu	−	+	−		S	7− all lac+
	1615	143d	n.g.						
	1616	143e	+ mu	+	+	−	−	S	2− lac+g
	1617	143f	+	+	+	−	−	S	0
	1618	143g	+ mu	+	+	−	−	S	0
	1619	145b	+ mu	+	+	±	+g	S	0
sl	(1620)	145c	+	+	−	−	+	S	7+/1− 7+/1−(?)
sl	(1621)	145d	+ mu	+	−	−	+	S	10+/1− all lac+
sl	(1622)	145e	+	+	−	−	+	S	3+/6− 5 lac+; 4 failed to grow
sl	(1623)	145f	+ mu	+	−	−	+	S	1+/1− 1 lac+; 1 lac−
	1624	145g	+ mu	+	−	−	+	S	0
←	1625	147c	+	−	−	−	+	S	☆
	1626	147d	+	−	−	−	+	S	☆
	1627	147e	+	−	−	−	+	S	☆
	1628	147f	+	−	−	±	+	S	☆
	1629	147g	+	−	−	+	+	S	☆
	1630	148a	sl	+	+g	−	+g	R	
	1631	148b	sl	+	+g	−	+	R	
	1632	149b	+	−	−	+	+	S	☆
	1633	149c	+	+	+	−	+	S	15+
	1634	149d	+	+	+	−	+	S	
	1635	149f	+	−	−	+	+	S	☆
	1636	150c	+	+	+g	−	+	R	
	1637	150d	+	+	+g	−	+	R	
	(1638)	150e	+	−	−	−	+	S	ca 100+
	1639	150f	+ mu	−	+	±	+	S	appeared S^R in cross
	1640	150g	+	+	+g	−	+	R	
	(1641)	151d	+	−	−	+	+	S	9+, 3−(?)
	1642	151e	+	−	−	+	+	S	1+
	1643	152a	+	+	+g	−	+	R	
	1644	152b	+	+	+g	−	+	R	

Cattini – Marquette

		loc	cello	suc	CK	mal	SM	SRP
1645	153a	+	−	−	±	+	S	☆
1646	153c	+	−	−	±	+	S	Peripheral gr; also 1− in center
1647	153e	n.g.						
1648	153f	(+)	+	+	−	+	S	☆
1649	153g	+	−	−	+	+	S	☆
1650	154b	+, sl	+	+g	−	+	R	
1651	154e	+, sl	+	+g	−	+	R	
1652	154f	n.g.						
1653	154g	+	−	−	−	+	S	appeared SP in cross
1654	155c	+	−	−	±	+	S	☆
1655	155d	n.g.						
1656	155e	+	−	−	+	+	S	☆
1657	155f	n.g.						
1658	155g	n.g.						
1659	156a	+	+	+g	−	+	S	ca 100+; 2 gummy
1660	156b	+	+	+g	±	+	R	
1661	156d	+	+	+g	±	+	S	1+
1662	157b	−	±	−	−	±	S	
1663	157c	+	+	+g	−	+	S	25+, 5−
sl 1664	158b	+	±		+	+	S	☆ W 1885 strong colicin; many separate colonies of w5g in cleared zone
1665	158c	+	−	−	+	+	S	
1666	158d	+	−	−	+	+	S	11+, 20− Recheck 3+, 6− Wg 38
1667	158e	+	−	±	±	+	S	50+, 45− W6 36 on recheck, 70+, 49−
1668	158f	+	−	−	+	+	S	5+, 9−
1669	158g	+	−	−	+	+	S	11+, 4−
1670	159a	+sl	+	±	−	+	R	keep 1666, 1667 as diff. sacs. f.o. 68, 69
1671	159b	+	+	+	−	+	S	
1672	159c	+	+	+	−	+	S	
1673	161b	+	−	−	+	−	S	2−
1674	161c	+	−	+	−	+	S	
1675	161d	+g	+	+g	±	+	R	
1676	161e	+	−	±g	−	+	S	1+
1677	161f	+	−	+	−	+	S	
1678	161g	+	−	−	+	−	S	
1679	162b	+	−	+g	−	+	S	ca 600+
1680	162c	+	−	−	+	+	S	ca 100−
1681	162d	+	+	+g	−	+	S	1−
1682	162e	+	±	+g	−	+	S	
1683	162f	+	−	+	−	+	S	partially resistant in SRP plating
1684	162g	+	−	−	+	little gr.	S	
1685	163b	+	−	−	±	+	S	4+
1686	163c	+g	+	+	−	+	S	
1687	163d	+g	+	+	−	+	S	
1688	163e	+	−	−	±	+	S	[1+, 2−(?)] [10+, 2−] Wg 42
1689	163f	+	−	−	−	+	S	18+
1690	164b	+	−	−	+	+	S	
1691	164c	+	−	−	+	+	S	
1692	164d	+	−	−	+	+	S	ca 100 mal− or mal slow
1693	165b	+	−	−	−	+	S	37+, 3−
1694	165c	+	−	−	±	+	S	5− or slow
1695	165d	+	−	−	−	+	S	
1696	168b	+	−	−	−	+	S	32+ Recheck 1+, 1− WG 37
1697	168c	+	−	−	−	+	S	1+
1698	169a	+	−	+	−	+	S	
1699	169b	+	−	+	−	+	S	1−

1625 - 1664

SRP cross done on S mal ∃ SM by adding 1 drop regular SM soln to each suspension. Strains marked * showed ring of growth around edge of plate where SM was more dilute, though center of plate was clear. All such growth mal +

Catlen - Marquette

		lac	cello	Suc	CK	mal	S/M	SRP
1700	169d	+	−	+	−	+	S	75+
1701	169e	+	−	+	−	+	S	1−
1702	169f	+	−	+	−	+	S	1+
1703	169fg	+	−	+	−	+	S	
1704	170a	+	−	+	−	+	S	
1705	170b	+g	+	+g	−	+	R	
1706	170d	+	−	−	±	+	S	
1707	171a	+g	±	+g	±	+	R	
1708	171c	+g	±	+g	±	+	R	
1709	171d	+g	±	+g	−	+	R	
1710	171e	+	−	−	++°	+	S	1+
1711	172a	+	+	+	−	+	S	
1712	172c	+	+	+	−	+	S	
1713	172d	+g	+	±	−	+	S	
1714	172e	+g	+	+	−	+	S	
1715	172f	+	+	+	−	+	S	
1716	172g	+	−	−	+	+	S	
1717	173b	+	−	+	+	+	S	
1718	173c	+	−	+	+	+	S	
1719	173d	+	−	+	−	+	S	5+
1720	173da	+	+	+	−	+	S	
1721	173e	+	−	+	+	+	S	15+
1722	174a	+	+	+g	−	+	S	
1723	174b	+	−	−	++°	+	S	1+
1724	174c	+	−	−	++°	+	S	
1725	174d	+	−	−	++°	+	S	
1726	176b	+	−	−	−	+	S	
1727	176c	+	−	−	−	+	S	
1728	176d	+	−	−	+°	+	S	
1729	176e	+	−	−	−	+	S	
1730	177b	+g	−	−	+	+	S	
1731	177e	+g	−	−	+	+g	S	1+
1732	177f	+	−	−	±	+	S	
1733	lac+ fr 1497	+	+	−	−	−	S	
1734	lac+g fr 1478	+g	−	±	−	+	S	
1735	lac− fr 1460	−	+	+	±°	+	S	
1736	lac+g fr 1461	+g	+	+	±°	+	R	
1737	lac+ fr 1482	+	+	+	±°	+	S	1+
1738	lac+g fr 1498	+g	+	+	±	+	S	6+, 2− (?)
1739	lac+ fr 1700	+	+	+	±	+	S	
1740	lac+g fr 1524		±	± OK	±	+	P	
1741	lac+g fr 1525		+g	+g	−	+	R	
1742	lac+ raffy fr 1528		±	−	−	−	S	
1743	lac− fr 1529		−	−	−	−	S	24−
1744	lac− fr 1530		−	−	−	−	S	10−
1745	lac− fr 1531		−	−	−	−	S	
1746	" " 1559	−	−	−	−	−	RS	
1747	" " 1560	−	−	−	+	+	RS	++ no−
1748	" " 1561	−	−	−	−	−	RS	
1749	" " 1562	−	−	−	+	+	RS	++ no−
1750	" " 1563	−	−	−	−	+	RS	++ no−
1751	sl " 1582	−	+	+	−	+	RS	
1752	− " 1564	−	−	+	−	+	RS	
1753	− 1693	−	−	−	−	+	RS	++ no−
1754	− 1677	−	−	−	−	+	RS	R
1755	− 1682	−	+	+	−	+	RS	++ no−

			lac	cells	Suc	CK	mel	SM	SRP		
1756	lac+g fr 1586		+g		+g	−	+	S	0		
1757	lac sl fr 1594		sl		+g	mlb by 518?	mel?	R			
1758	" " " 1596		sl		+g	−	" ?	R			
1759	" " " 1597		sl		+g	−	" ?	R			
1760	lac− fr 1648		−					S	#		
1761	lac sl fr 1650		sl					R			
1762	lac sl fr 1651		sl					R			
1763	E. coli II Colwell		+		+	⊕	−	S	= W1939 = Wg 50		

~~Bernstein~~ – Cultures 9/16/53. (All human isolates).
1177 1817.

			lac	cells	Suc	CK	mel	SM	SRP		
1764	Coli 055B5	JD 4798	+		−	−	+	R			
1765		J.D. 790	+		+	−	−+	S			
1766		J.D. 2711	+		+	−	−	S			
1767		JD 6816	+		−	±	+	S		1+L+	1+L+
1768		JD 6882	+		−	−	+	S			
1769		AB. 1	+		−	−	+	S		2+	1+
1770		AB. 2	+		−	−	−+	S			
		~~AB 3~~	~~+~~		~~+~~	~~−~~		~~S~~			
1771		AB 3	+		+	−	−	S			
1772		AB 6	+		+	−	−	S			
1773		AB 7	+		+	−	−	S			1−
1774		AB 15	+		+	−	−	S			1−L−
1775		AB 21	+		+	−	−	S			
1776		JD 888	+		−	+	+	R			
1777		JD 890	+		−	−	+	S			
1778		JD 905	+		−	±	+	S			
1779		JD 3801	+		−	+	+	S			
1780		J.D. 903	+		+	−	−	S			
1781		AB 5	+		+	−	−	S			
1782		AB 27	+		+	−	−	S			
1783		AB 55	+		−	−	+	S			
1784		AB 52	+		+	−	−	S			
1785		AB 46	+		+	−	−	S			
1786		AB 5087b	+		±	−	+	S			
1787		J.D. 900	+		−	−	+	S			
1788		J.D. 917	+		−	−	+	S			
1789		AB 4	+		+	−	−	S			
1790		AB 8	+		−	+	+	S			16+
										[redacted]	~~All human (cracked)~~.
1791		AB 9	+		−	+	+	S			
1792		AB 10	+		−	+	+	S			
1793		AB 11	+		−	+	+	S			
1794		AB 12	+		−	+	+	S			
1795		AB 14	+		−	+	+	S			
1796		AB 16	+		+	−	−	S			
1797		AB 17	+		+	−	−	S			2 lac −
1798		AB 18	+		+	−	−	S		[redacted]	(cracked)
1799		AB 19	T		+	−	−	S			
1800		AB 20	+		+	−	−	S		3 [redacted]	(cracked)

			Enc	allo	Smc	CK	Wol	gm	SAP. 1127	1817	
1801	Cli 05535	AB 22	+		−	+	+	S			
1802		AB 28	+		−	+	+	S			
1803		AB 24	+		+	−	−	S			
1804		AB 25	+		+	−	−	S			
1805		AB 26	+		+	−	−	S			
1806		AB 28	+		+	−	−	S			
1807		AB 29	+		+	−	−	S			
1808		AB 30	+		+	−	−	S			
1809		AB 31	+		+	−	−	S			
1810		AB 32	+		+	−	−	S			
1811		AB 33	+		+	−	−	S			
1812		AB 34	+		+	−	−	S			
1813		AB 36	+		+	−	−	S			
1814		AB 37	+		+	−	−	S			
1815		AB 38	+		+	−	−	S			
1816		AB 39	+		+	−	−	S			
1817		AB 40	+		+	−	−	S			
1818		AB 41	+		+	−	−	S			
1819		AB 42	+		+	−	−	S			
1820		AB 43	+		+	−	−	S			
1821		AB 44	+		+	−	−	S			
1822		AB 45	+		+	+	−	S			
1823		AB 47	+		+	−	−	S			
1824		AB 48	+		−	−	+	S			
1825		AB 49	+		−	−	+	S			
1826		AB 50	+		−	+	+	S			
1827		AB 51	+		−	+	+	S			
1828		AB 53	+		−	+	+	S			
1829		AB 54	+		+	−	−	S			
1830		AB 56	+		−	+	+	S			
1831		AB 57	+		−	+	+	S			
1832		AB 58	+		+	−	−	S			
1833	~~Cli [illegible]~~	AB 59	+		+	−	−	S			
1834	Cli 011134	AB 1	+		−	+	−	S			
1835		AB 2	+		+	+	+	S	2+	[illegible]	
1836		AB [illegible]	+		−	+	−	S			
1837		AB 6	+		−	+	−	S			
1838		AB [illegible]	+		−	+	−	S	1−	[illegible]	
1839		AB 7	+		−	−	−	S			
1840		J2127 69	+		−	−	−	S			
1841		J2.5344	+		−	−	+	S			
1842	Cli 02636	AB 1	+		−	+	+	S		1+ [illegible]	
1843		AB 2	+		−	−	+	S			
1844		AB 3	+		−	−	+	S			
1845		AB 4	+		−	+	−	S	1 −	[illegible]	
1846		AB 5	+		−	−	−	S		1− [illegible]	
1847		AB 6	+		−	−	+	S		1+ [illegible]	
1848		AB 7	+		+	−	+	S			
1849		AB 8	+		+	−	+	S			
1850		AB 9	+		−	−	+	S		8+ [illegible]	

			lac	Cello	Suc	CK	Hal	1177	sal. 1817	
1851	Chi 02656	AB 10	+	—	+	–	+	0		
1852		AB 11	+	—	+	—	+	0		w 2665 = wC56
1853		AB 12	+	—	—	—	+	0		
1854		AB 13	+	—	—	—	+		4+8 - [illegible] = 1177 - , 1817 [illegible]	
1855		AB 14	+	—	+	—	+	0		
1856		AB 15	+	—	+	—	+	0		
1857		AB 16	+	—	+	—	+	0		
1858		AB 17	+	—	+	–	+	0		
1859		AB 18	+	—	+	+	+	0		
1860		AB 19	+	—	+	+	+	0		
1861		AB 20	+	—	+	+	+	0		
			Rogers - [illegible] in [illegible]							
1862	Johnson	011	+	—	—	—	+	0		
3	Smyth	0111	+	—	—	—	+	0		
4	Hewitt	0111	+	—	—	?	+	0		
5	[illegible]	0111	+	—	—	—	+	0		
6	Lindsay	055	+	—	+	—	—	0		
7	[illegible]	053	+	—	—	—	+	0		
8	Robson	055	+	—	+	?	—	0		
9	Norman	055	+	—	—	—	+	0		
70	Lockwood	026	+	—	–	?	+	0		
71	Rowe.	026.	+	—	—	—	+	0		

3
[illegible]
500

Ewing coli O55

Smal ↙

	O #	Ewing no.	Gal	Mal	Mtl	Suc	Cello	Lac	Xyl	Smtl	SM	T1 – 7; pl#22	+1485	λ λ2	F– 1177	F+ 1817
1872	1	~~66~~ 3872.50	+	+	—	|—		—	+	All	S			all R		
3	2	5624.50	+	+	+	—^{m}	↓	+	+	prh_s	S					
4	3	6556.50	+	—	+	+		↓	+		S					
5	4	53.57	+	—	+	+			+		S					
6	5	54	+	—	+	+			+		S					
7	6	55	+	—	+	+			+		S					
8	7	56	+	—	+	+			+		S					
9	8	57	+	—	+	+			+		S	T_1^S				
80	9	58	+	—	+	+			+		S					
1	10	59	+	—	+	+			+		S					
2	11	60	+	—	+	+			+		S					
3	12	61	+	—	+	+			+		S					
4	13	162.	+	+	1—	S			—		S				0+	0+
5	14	163.	+	+	—	S			—		S					
6	15	165	+	+	—	S			—		S				●	σ+ +
7	16	1703	+	+/–	—	S			—		R					
8	17	1704	+	+/–	—	S			—		R					
9	18	586.52	+	+/–	S+	+			+/–		R					
90	19	589.52	+	+	+	+			+		S	=W2691=W657			0+	4/5– ✓ –
1	20	590	+	—	+	+			↓		S					
2	21	591	+	—	+	+^{s}	↓				S				3–	0
3	22	967	+	+	+	+^{s}	—				S	**	++			
4	23	5913	+	+	+	+	S				S					
5	24	5925	+	—	+	+	—	↑	↑		S					
6	25	5926	+	—	+	+	—	+	+		S					

all 0 except where noted

0+ = single or 2 Mal+

Ewing coli O111

	O#	Ewing #	λ type (all λ^R λ_2^R)	T 1 2 3 4 5 6 7 plt32	lac	suc	glu	gal	mal	xyl	allo	sm	F− ×1177	F+ 1817	
1897	26	805.50 #67		all T^R		S		+ ↓	+	+	− ↓	S	0	0	
8	27	806.50 #72		all probes on Smtl		S			+	↓		S ↑	0	0	
9	28	807.50 #82			all +; except	S			+			R small			
1900	29	808.50 #95				S			+			S Slac	26+	34+	✓
1	30	1332.50	+ (1485)		↓ 41, 51	S			+			S ↓	1+	0	
2	31	1333 ↓	+ "			S			+			S	+/−	+	✓
3	32	1334 ↓				−			+			S	0	0	
4	33	1594				S			+			R	●	●	
5	34	5267				S			+			R			
6	35	5268 or 81				S			+			R			
7	36	5498			+	S			+			R			
8	37	5499				S			+			R			
9	38	5500				S			+			R			
10	39	5501			↑	S		↑	+		↑	R			
1	40	5623	+ 1485		+	−		+	+		−	S	0	0	
2	41	5690			−	+		−	+		+	S	1−	0	
3	42	5918			+	S		+	+	↑	↓	R			
4	43	5919			↓	S		↓	+	+		S	0	0	
5	44	6170 date 2				S			+	−		R			
6	45	6171 " 3				S			+	−		R			
7	46	6172 " 4				S			+	−		R			
8	47	6238				−			−	+		S	1+	0	
9	48	6239				−			−	+		S	6	1+	
20	49	6240			↑	S			−	+	↑	R			
1	50	6241			+	S			−	+	+	R			
2	(51)	6338 ↑			−	−			+	−	−	S	###	###	all lac−; typical ✓
3	52	1795.51			+	S			+	−	↓	R			
4	53	2092.51			↓	S			+	+		R			
5	54	585.52				S			+	+		S	0	0	
6	55	587				−			−	+		S	0	0	
7	56	588	+ 1485			S			+	+		R			
8	57	718				S			+	+		R			
9	58	719				S			+	+		R			
30	59	3546	± 1485 (diffuse)			−			−	+		S	2+	0	
1	60	4957			↑	S		↑	+	−	↑	S	0	0	
2	61	5927	± 1455 (diffuse)		+	−		+	−	+	−	R			
	~~62~~ ~~62~~	{~~5266.51~~ ~~5281~~ wrong strain}													

Plated on sm

O29 3 Mal+
O25 8 Mal −
O51 0

Ewing Coli from [illegible] Francis. 5/55.

All λ, $λ_2$, T_1 − T_7 resist.

	Ewing #		Lac.	Cello	Suc	Mal	M/H.	Xyl	SM	ETTS lac SM. 1122	18D
1933	586-52	055 B5 H6 (sporadic M'kee).	+	−	+	−	−	+	S	~~0~~	0
4	589-52	" "	↓	↓	↓	↓	−	↓	↓	0	0
5	590-52	" "	↓	↓	↓	↓	+	↓	↓	0	0
6	591-52	" "	↓	↓	↓	↓	−	↓	↓	0	0
7	3320-54	" (Sporadic Chi).	↓	↓	−	+	−	↓	↓	0	0
8	3321-54	055 B5 H10 (" ").	↓	↓	+	−	+	↓	↓	0	0
9	3701-54	055 B5 H− (" ")	↓	↓	↓	+	↓	↓	↓	0	0
40	3710-54	055 B5 H− (" ").	↓	↓	↓	−	↓	↓	↓	0	0
			↓	↓	−	+	↓	↓	↓	0	0
1941	121-55	0111 B4 H− (Outbreak Fla.)	↓	↓	↓	↓	↓	↓	R	—	—
2	124-55	"	↓	↓	↓	↓	↓	↓	R	—	—
3	128-55	"	↓	↓	↓	↓	↓	↓	R	—	—
4	4869-54	" (Outbreak, Ohio)	↓	↓	↓	↓	↓	↓	S	0	0
5	4870-54	" (" ")	↓	↓	↓	↓	↓	↓	S	0	0
6	3714-54	" (Sporadic Chi).	↓	↓	↓	↓	↓	−	R	—	—

Note 10/56. By this series, 589-52 is not futile. (771-1934). J.

776-1890

Cultures from Karakasević
(Yugoslavia)

7/55 DCG

776-

1947 82 (O_{111}-B_4)
48 96 (O_{111}-B_4)
49 30 R (O_{111}-B_4)
50 V57 (O_{111}-B_4)
19 51 C173 (O_{111}-B_4)
52 64 (O_{55}-B_5)
53 Dd13 (O_{55}-B_5)
54 92 (O_{111}-B_4)
55 93 (O_{111}-B_4)
56 1015 (O_{111}-B_4)
57 Dc 173 (O_{111}-B_4)
58 21 (O_{55}-B_5)
59 Da 39 (O_{55}-B_5)
60 Dc 99 (O_{26}-B_6)
19 61 C76 (O_{111}-B_6)
62 r26 (O_{55}-B_5)
63 1064 (O_{55}-B_5)
64 30 wf (O_{111} B_4)
65 V97 (O_{26} B_6)
66 V101 (O_{55}-B_5)
67 96 (O_{26} B_6)
68 V16 (O_{26} B_6)
69 47 (O_{111} B_4)

AUG 17 1955 F Ørskov

			x1177 (F-)	x1817 (F+)
1970	1064 = ~~W249~~	055 B5 H6	0	0
1972 ~~972~~	972	" "		
~~1972~~ 1971	Stolac P	" "	0	2 {1of 3 / [illegible] / control
1973	Stolac W	0111 B4 —	0	0
1974	abradum 4	0 111 B4 —	0	0
~~1975~~	Jonna P	0 111 B4 —	1:2 on ea incl control	
1976	416	0111: B4: H2	0	0

OCT 12 1955

1977 1064 lac+ Mal+ } see letter
1978 1064 lac± Mal+

July 8, 1955. Resume

SRP tests on named cultures.

① Fredericq series = 776-96-108 (xW1177) 2 kept as wg 9, 10

W 1377, 1395-97 x W1177

11/17/50 B/6 W1362 W1376 W 1113

1/1/51 Evening

for first 1500, mostly only 1177 as parent.

? were Shapiro's other strains (W1028 etc.) were tested ?

E.M.L. Aug. 1956.

Summary of Serotyping. wg series 1-50 inclusive. Feb. 1953. ~~xxxxxxxSeptx~~

note:

(i.e. rough)

strains omitted from table below were self agglutinable either before of after boiling or were unstable. H typing wherever it was possible to motilize the bacteria. Only in O neg. strains could K reading be obtained, during the interval that the typing was attempted. Method summarized in raw data.
Special emphasis on wg not done before by Ewing, or by Skaar.
Some reaction s only up to group.

1. O – H + (new group)
3. H – (skaar); O = 8
4. " ")O = C + N group. K present.
11. ?
12.) O–
13. morphol. rough . H: 13 + group F.
14. O–
15. H: A + C. O= 1 (12)
16. H= A + C
17 H– skaar. confirmed
18 " " "
19 " " ". O –. K 19
20. H: B run down to H 7.
23 O–
25 H = 4
26 H = 1
27 H – Skaar
28 O–
29 H = C,F,G. O–
30 H = F.)) O = 27
31 H– skaar. O–
32 O–
33 H group A. 4?. O 4.
35 H " E. O 21
36 H : A + C. O 9
37 2 types: K– O 4, 18. O+K+. K H D,F,G (A)
39 O = 4 (18)
40 O = 7
41 H: G, but late. Ox = 77
43. H: 4, C, F,
44 H: C,E,F. O 26 (21)
45 O = 77
46 H+ 7? O= 76
47 H= 13, O– K 3 (23)
48 H: F O = 81
49 rough

groups #20 poly V
O 124 21-20 single
5 titration series

K 60 no pools

H 7 32 → 7 polyvalent sera
5 each.