May 21, 1918.

\[ W-67 \times Y64 \quad \text{Lac}^+ - V,^5 \times \text{Lac}^2 - V,^R.\]

Among 28 plates carrying ca. 100 good-sized colonies each, only 7 + colonies were noted (2 uncontamin.). Ca. 1/100 + : -.

Score +5 for phage resistance.

\[ \text{Lac}^+ : (\text{only 3 rapid} +) \quad \text{ACC} \text{ R}.\]

\begin{array}{c|c|c}
\text{Lac}^- : & R & S \\
\hline
10 & 0 & \\
20 & 0 & \\
18 & 0 & \\
\hline
48 & 0 & \\
\end{array}

Deficits are again missing.

Hypotheses:

1. \text{Lac}^- is not lethal in sexual progeny.
2. \text{Lac}^- is linked to a "setback" which maybe a nutritional requirement.
3. \text{Lac}^- are not produced in these cases due to chromosome aberrations or related phenomena.

2. Cross W-67 and Y64 on glucose medium.
3. If an "inversion" what are the limits of its action.
May 21, 1948.

On EMS lac - B.

1. W-108 X Y40. Cross n.g. W-108 (only streaks on glucose agar)


S + treated MRL V, R.

What linkage relationships are indicated if the lac + are merely not recovered? The combinations are:

By Lac + V, R Tl. X Lac - V, S. Lac + may simply be closely linked to V, or situated so that a triple interchange is required to give a 'lac + V, S' combination, e.g.

I

<table>
<thead>
<tr>
<th>DM</th>
<th>Lac</th>
<th>Tl</th>
</tr>
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<tbody>
<tr>
<td>+</td>
<td>V</td>
<td>S</td>
</tr>
<tr>
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<td>-</td>
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</tr>
<tr>
<td>+</td>
<td>R</td>
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II

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Note
May 24, 1948.

Basic salts + EMB +
before series + TCB, BM

G.

---

1. Na succinate 1%
2. " " 0.5%
3. Asparagine 1%
4. " " 0.5%
5. Na aspartate 1%
6. " " 0.5%
7. Na glutamate 1%
8. " " 0.5%

Designate EMA. (cost > $1/kit.)!

---

b. Case W-108 x Y40 on a plate each of series S. 1924.

(W-108 is ca 1/4 lac +. sol. cannot be varicin.)

strike out

m a plate each of series L.
3P
1+2. No. pustular colonies. Prinpoint background. (poss. a few v.sm.)
3.+ 4. Numerous pustules > 1mm. diametrically, many already showing lac+ or - . 4a little larger than 3, but uncertain.
5. Prinpoints
6. Like 5
7. Prinpoint background.
8. << 7.

Asparagus, so far, is the most superior supplement.

9:30 P.

1,2, 7, 8 prinpoint background.
3, 4. (asparagus) 3: v. well developed colonies, especially lac+. Numerous colonies not so large but more numerous.
4: do. lac+ more accentuated lac- possibly slightly smaller.

5, 6 (aspartate). 5: Fewer colonies, lac+ only
6: Ditto

9A. 26.
1,2, 7, 8.
Prinpoints, v.g.

3 shows slightly higher yield than 4, which permits lac+ counting on 1.
lac+/lac- character is perhaps more distinct on 4. Background is satisfactory probably less marked on 3.

5. Yield about 1/5 of 3. Lac- tends to be smaller than lac+, but not necessarily.

EMS standard: Exceeding background, yield point variable in 25%
May 26, 1948.

An ace FMA:

1. Y46 x W45
2. W108 x W45

1) Non-yield.
2) Yields too low.

\[
\begin{array}{c}
\frac{1}{4} + \frac{3}{4} = 1 \\
0 + 0 = 0 \\
0 + 0 = 0 \\
12. 0
\end{array}
\]
May 27, 1948.

On bac + Iller A:

3. W-67 x Y46  Non-yield (1 colony/1 plate). S+V,R. No -

4. W-67 x Y64.

A29:

Yield much higher in W-67 x Y46 than in W67 x Y64.

All - (many started to precipitate - probably Y64).

Test on T1.

4': 33 - all R. No +.
May 28, 1948

1. W-145 x Y46 R. Lec B.
2. W-337 x Y46 R. Lec B.
3. W-145 x Y87.
4. W-45 x W-145
5. W-337 x Y87.
6. W-337 x W45. Lec B.

A31:

\[\begin{array}{c|c|c}
+ & - \\
1 & 9 \\
1 & 3 \\
0 & 23 \\
\hline
2 & 35 & 37 \\
\end{array}\]

\[\begin{array}{c|c|c|c}
\text{MB} & 0 & 3 plates \\
L0 & 0 & 12 \\
4 & 0 \\
\end{array}\]

2 plates unannealed + and -

1:

\[\begin{array}{c|c|c|c|c|c|c|c|c|c}
+ & - \\
9 & 8 & 2 & 16 & 14 & 12 \\
12 & 5 & 10 & 6 & 3 \\
\end{array}\]

\[\begin{array}{c|c|c}
27 & 60 & 187 \\
\end{array}\]
Yield too low for satisfaction


\[ \begin{array}{ccc}
0 & 0 & 0 \\
0 & 1 & 0 \\
1 & 0 & 1 \\
\hline
2 & 1 & 0 \\
\end{array} \]

Background pattern heavy, but not dormant.


\[ \begin{array}{ccc}
1 & 0 & 0 \\
1 & 0 & 0 \\
\end{array} \]

Dense background.

Many small photobases.

Plate only satisfactory. Hotel!

(7) Colonies pooled exhaustively, + tested on lac EMA + T1.

\[ \begin{array}{cccc}
49 & 14 & 11 & 6 \\
50 & \text{(total)} \\
64 & 17 \\
61 & 20 \\
\end{array} \]
June 2.

3 \((W - 145 \times 187)\)  +  -

\[
\begin{array}{ccc}
6 & 25 \\
\frac{4}{3} & 29 \\
\frac{3}{4} & 20 \\
\hline
17 & 78 & 95
\end{array}
\]

(6) \(W - 45 \times W - 327\). Notes crowded. About 1% + colonies.

Bee competition!
January 29, 1948.

1. W-67 x Y46
2. W-67 x Y64
3. W-45 x Y46
4. W-125 x Y40
5. W-123 x Y40

A31.
1. Yield (6) (Glucose EMB) 10 plates + 3 Lee plates.
2. OK: - > + (linked to 134).
3. 2 plates. Should be vac B.

June 3.
2: on Lo, 14 +: 2 -
on Lo, many plates show more - than +. Many micro colonies are papillate or have turd color.

On source:

<table>
<thead>
<tr>
<th>Lo</th>
<th>4</th>
<th>12</th>
<th>8</th>
<th>18</th>
<th>15</th>
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<td>9</td>
<td>18</td>
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<tr>
<td>Lo</td>
<td>31</td>
<td>45</td>
<td>76</td>
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</tbody>
</table>

\[ \chi^2 = 10.9 \quad p = .001 \]
2 - studied to be B, A, T.

\[ -R \quad -S \quad +R \quad +S \]

<table>
<thead>
<tr>
<th>L0 plate</th>
<th>10</th>
<th>3</th>
<th>0</th>
<th>2</th>
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</table>

"+" of previous page mean may not be truly so.

<table>
<thead>
<tr>
<th>LB</th>
<th>16</th>
<th>13</th>
<th>8</th>
<th>10</th>
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<td>29</td>
<td>20</td>
<td>12</td>
<td>0</td>
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</table>

These plates are truly to be for accurate study.

3: 13 all -
Nutritional mutant run: S. typhi-murium

May 29, 1948.

Irradiate suspensions of S-20, and 21 as follows.

Grown (6 h.) suspensions of S--- in YZ-glucose, shaken, resuspended in H2O.

S-20 exposed to Hanovia output at aperture of lamp in quartz flask shaken by hand. 5 ml. suspension added, .5 ml removed at stated intervals to 10 ml. tubes of YZ-glucose shaken at 37.

S-21 exposed in 1 ml. lots in 10 cm Petri Plates, exposed at table level (ca 12 cm) .5 ml samples removed from each plate.

S-20: 10, 30, 60, 120 and 180 secs. Samples: 0 + 0 + 60 + + + + + + + + + +.
S-21 2, 5, 10, 20, 30 and 60 secs. Samples 2 - 10 + + + 20 - 60 + + + +.

Dilute S-20, 10 second and S-21 5 second exposures 10^{-7} and plate in minimal layered agar, 24/30.

For reference, S-20 = 5 W^{-1} and S-21 = 5 W^{-2}.

Ca 30 plates each, and 10,000 colonies.

II picked, 9 grew-up in series S-21
23 " , 21 " " series S-20.

Numbers 1-21 are S-20; 22-30 are S-29.

Mutants SW-3 and SW-4 ( ) from S-20

SW-5-8 ( ) from S-21.
<table>
<thead>
<tr>
<th></th>
<th>Lactose</th>
<th>MacConkey</th>
<th>EMB</th>
<th>LAC</th>
<th>EMB</th>
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</table>

**Note:** All except 2 of which is shown with a typical EMB plate.
Plate a mixture of W-108 and T1 on the EMB, select 8 surviving colonies and plate out 3 times. Test these 8 and W-108 on T1 and on TS:

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<thead>
<tr>
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<th>T1</th>
<th>TS</th>
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<tbody>
<tr>
<td>1</td>
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<td>8</td>
<td>RR</td>
<td>RR</td>
</tr>
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</table>

W108

The R,R types are presumably V1\text{R} and the R,S V1\text{A}. Select 1 and 2. There is an unusual predominance of V1\text{A}: (2/8).

See 231c. W-100 is T5\text{R}. 

May 31, 1948.

On Lac + E. coli EMA.

1. 58-161 x W399
2. 58-161 x W400
3. W45 x W399
4. W45 x W400
5. W67 x Y10
6. W67 x Y64
7. W67 x Y46
8. W45 x 58-161
9. W45 x W45

June 3.

2. Ditto.
3. No yield (1 col/3 plates).
4. All - colonies, probably not failed. Close linkage of Lac to Vib confirmed.
   Strain to Haldane. All out of 3 are Mal- with heavy + contamination.
5. Yield ok. > 1 glucose thanon lactose. Perhaps 10% of colonies + lactose.
6. Tn2 inducer not starting.
7. No yield, no glucose or no lactose.
8. Like 1. Pick at random to lactose.
9. 1 plate. 1+, 30+ V - colonies.
Q. 2 classes of colonies.  large spreading, probably + and small compact, - ?

Frequencies:  "+"  "-"  20  578 / 598.  Ca. 3.3% + in agreement with
Test "+" and "-" separately on EMA-1a (15), best pheromone observation

"+"  -R  +R  -S  +S
  27  0  0  0  0

"-"  53  0  0  0

\[ \frac{80}{81} \]

Q. Same as Q in appearance of projection of +.

"+"  30  0  0  0  1

"-"  53  0  0  0  0

\[ \frac{83}{84} \]

Altogether only about 2/18/15 or ca. 1.5%
5a. Pick from glu EMA to lactose EMB.

5b. Pulled 4 lac- strains out on lac EMB.

210-5g (1-4%).

May 25, 1948.

Test for: \((c_{12} + BM)\) p25 - A27.

1. \(T(m) + 10\%\) succinate
2. " " + Y.Ck.
3. " " N2Case
4. " " Vits.
5. \(T(o)\) glucose-asparagine 2.

<table>
<thead>
<tr>
<th></th>
<th>A W-67</th>
<th>B 58-161</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>± +</td>
<td>± ++</td>
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<tr>
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<tr>
<td>14</td>
<td>+++</td>
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</tbody>
</table>

\(p_{26}. A_{27}\).

W-67 is not nutritionally distinguishable from 58-161.

Strain out on \(Lac A + BM\) etc. p26.

11A. \(^{+\text{p}}\). ++  v.small

11B. +++ +++ +++

Lecy - should be produced without

Ampicillin or \(A_{27}\) plates.

217

Incubate + shake in Y2-glucose tubes, overnight.
1 5 3
B516, B516x and Nalb arg = B5-
Wash + resuspend cells in vol. 0.2 citrate saline buffer.
Spread 1 drop each of 0 + 2 together and separately on T(0) plates. Also have Y2 with 0.5 ml inocula together + separately + shake. Also carry along 3.

June 2, 1948.
1 0 colony, 1 slight background
2 0, 0 practically no background

1+2 11, 6 background nearer heavier than with 1 only.

(need other medium).
Also plate suspensions from above:
1 0, 0
2 0, 1
1+2 (mixed separately) 4, 9 7 (odd!)
1+2 (mixed together) 1, 0

The possibility of recombination is not ruled out by these experiments.
June 2, 1948.

P. Spread .1 ml of suspensions of p. 212 on Nutrient Agar plates containing 1140.014/ml of penicillin & sterile treptone.

1. Bs 16 (thyrphophanless)  2. Bs 16/Y (cytochrome).

1. Scattered colonies in sterile portions of plate.
   P5: ca 10 colonies distinct; some spreading confuses count.
   P10: 5 distinct colonies.
   S1: Almost confluent background, with papillae.
   S5: ca 200 distinct colonies, no background.
   S10: ca 100 distinct colonies.
   N.A.: Heavy smear.

2. P1: ca 12 distinct, v. large colonies (smear). 
   P5: 2 colonies, quite large.
   P10: No colonies.
   S1: As 1.
   S5: (Plate culture dried). Ca. 500 colonies (smear?).
   S10: Several hundred colonies.
   N.A.: Heavy smear.

Keep high count plates for purification, as N.A. is +ve drug.

Student: Test single colonies on P10, S10 and N.A.

<table>
<thead>
<tr>
<th>Plate</th>
<th>P10</th>
<th>S10</th>
</tr>
</thead>
<tbody>
<tr>
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<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>16/S10</td>
<td>++++</td>
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<tr>
<td>16/P10</td>
<td>++++</td>
<td>-</td>
</tr>
<tr>
<td>16/S10</td>
<td>++++</td>
<td>-</td>
</tr>
</tbody>
</table>

Very large colonies in triplohydram agar.
P3. Use Y2-glucose 7/P10 and 1S/10 to obtain cultures for high cup variants. 

Spread 1 drop each culture on NA 7 Read A5.

16/10 P5 P10 PS20 P120 S10 S50 3/10 S500 0

8

16/510

-1 centim. ca 100 scattered colonies. 3 different mixed small

5

16/4/1 P10 200 700 2a 30 1-700 2 large 0 small

16/4/510

num. num. 500 200 100 small Smell Santed 40 6 0

Almost (small)

Sented.

Test the following, as indicated:

S500 S100 P10 P100 S10

Summarize.
Test colonies from the following plates & cultures.

<table>
<thead>
<tr>
<th></th>
<th>P10</th>
<th>P100</th>
<th>S10</th>
<th>S100</th>
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<td>&quot;164 S10</td>
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<tr>
<td>16410/1000</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>R</td>
<td>R$^5$</td>
<td></td>
</tr>
<tr>
<td>164 P100</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>164 P500</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>164.510 .P100</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>R</td>
<td>R$^5$</td>
<td>S</td>
</tr>
<tr>
<td>164.510 .P100</td>
<td>S</td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

Streptomycin resistant are OK, sharp distinction between the 10 and 500 unit levels. No penicillin resistant so far noted.

Streak-out on NA, the cultures 213B-1 and 213B-2.
June 3, 1948.

1. W-337 x W-45
2. W-145 x Y40
3. W-126 x Y40.

Simultaneously, streak out W-45 and Y40 as lecA+(B+Y).

P4. W-45+Y40 are well grown on the synthetic medium, but none of the crosses show any colonies of significant size.

P5. 1. No colonies on lecA+B+.
   2. No colonies on lecA.
      Some plates of T(B+) have colonies, irregularly scattered
   3. No colonies on T(B+) or lecA+B+.

P6. 1. No Colonies.
   2. few colonies from T(B+) to lec T1.
   3. 1 + colony on plate.
June 4, 1948

\[ \text{w-133} \times \text{v/v/o.} \quad \text{on} \]

A) \( \Gamma(B,.) \)
B) \( \text{Lac A}(0) \)
C) \( \text{Lac A}(B) \)
D) \( \text{Lac A}(B,.) \)

P6. Colonies appearing in D, after C. \( \text{ca 6/plate m A.} \)

A. \( \text{ca 6/plate} \)
B. \( \text{2+/5 plates} \)
C. \( \text{ca 100/plate} \)
D. \( \text{ca 50/plate} \)

A. Plate with test suspensions on T/min Lac EMB. Background to vary. All halo + V.R.

B.

C. + D. peeps + and - rapidly:

\[ \begin{array}{c|c|c}
| & + & 24 \\
| + & 1 & \\
| \hline
& 20 & 6 \\
\end{array} \]

\[ \begin{array}{c|c|c}
| & + & 17 \\
| + & 0 & \\
| \hline
& 11 & 1 \\
\end{array} \]

\[ \begin{array}{c|c}
& 28 \\
\hline
& 1 \\
\end{array} \]
Salmonella Irradiation

double mutants.

June 4, 1948,

Irradiate washed 8 h. suspensions of SW-3, SW-7, SW-8 and S-21, in 1 ml. lots in open Petri plates. Recover ½ ml samples to NZ-glucose broth, and shake overnight.

In S-21 series, plate .05 ml sample from the initially inoculated cultures to estimate killing rate. 5, 10, 20, and 30 seconds under Hanovia lamp.

Assuming inoculum of $5 \times 2 \times 10^8 \times 0.05 = 5 \times 10^6$, the killing's can be estimated.

<table>
<thead>
<tr>
<th>sec</th>
<th>5.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.000</td>
<td>.3</td>
</tr>
<tr>
<td>2.37</td>
<td>4.3</td>
</tr>
</tbody>
</table>

These suspensions were inadvertently autoclaved.

---

Graduate the above washed suspensions, as above, dilute as indicated, and plate directly into detection plates. SW-3 suspensions not available.

<table>
<thead>
<tr>
<th>sec</th>
<th>5 = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>10P6, 36L. Cori e N366. Test tartar. Agar.</td>
<td></td>
</tr>
<tr>
<td>SW-7</td>
<td>SW-7 series not yet grown. Don't cover.</td>
</tr>
<tr>
<td>SW-8</td>
<td></td>
</tr>
</tbody>
</table>

On T(0) plates, single drops of SW-3, 7, 8 as indicated.

<table>
<thead>
<tr>
<th>No.</th>
<th>Colony</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3, 2</td>
</tr>
<tr>
<td>7</td>
<td>2, 1</td>
</tr>
<tr>
<td>8</td>
<td>2, 1</td>
</tr>
</tbody>
</table>

Numerous plaques noted (syphylomucos?)

3 x 7 x 8, heavily with 10-2 colonies. See 217.
SW7 series formed small colonies only on June 9. Throat plate. L-12-V supplement not optimally the proportion to used.

SW1 and SW8 series. About 20% of SW1 and 10% of SW8 were small colonies. Either mutant or contaminant. Picked tubes about 100 in each set. Pick colonies to small tubes 1/2 with loop, suspend E193 and put visible nuclei in 10% into T(C)+
fygrophon. Most was - in small tubes; the following were +:


SW8: (delay scoring).

Test SW1: 1-3 and SW8: 2-2 in T(7x) large tubes.
All +++. Small tube tests are inaccurate. T.O. exp.

217. Plate SW3 & SW7 on N.A. in 10^- dilutions included.

<table>
<thead>
<tr>
<th>SW3</th>
<th>SW7</th>
</tr>
</thead>
</table>
| 10^-1 | 10^-1     | Dead host growth
| 10^-7 | 10^-7     | Isolated colonies (ca 1000) do.
| 10^-7 | 10^-7     | Isolated growth. No plaques.
| 10^-1 | 10^-1     | 3
| 10^-1 | 10^-1     | No evidence of hypogran.

Of hypogran. on nutrient agar.
June 5, 1948.

**SW-6. (pab.)**

<table>
<thead>
<tr>
<th>O</th>
<th>Vit.</th>
<th>pab.</th>
<th>HC</th>
<th>pat+HC</th>
<th>pat, HC, PP.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After 18.7 hours: -  +  +  -  ++  ++

**SW-7. (leuc, val, val).**

*S. nov. control.*

<table>
<thead>
<tr>
<th>O</th>
<th>HC</th>
<th>L</th>
<th>IIL</th>
<th>L:V</th>
<th>L:IL</th>
<th>L:V</th>
<th>L:IL:V</th>
</tr>
</thead>
<tbody>
<tr>
<td>-7</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

Leucine - isoleucine - valine

+ (Y) 18 hours: + + + + + + + + + + + + + + +

**SW-8. (pypt.)**

<table>
<thead>
<tr>
<th>O</th>
<th>pyr.</th>
<th>indole</th>
<th>aniline</th>
<th>nicotini</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18 hours: -  ++  -  -

Later: + + +
June 8, 1918.

\[ Y53, Y40 + W108 \text{ in } Y2 \ldots (\text{glucose or gluconic}) \]
\[ A - \text{shaken} \quad B - \text{unshaken} \quad \text{Mix volumes and plate} \]
\[ 1 \text{ drop each in lacA} + 8, \quad \text{and lacA} + B, \quad T(\beta, \gamma). \]

1. \[ Y53 \times Y40 \]
2. \[ Y108 \times Y40 \]

B anaerobiosis are, of course, much less dense than A.

A 10.

1A. \[ 27, 23, 34 \quad \text{in } T(\beta, \gamma). \]
\[ 27-1+ \quad 0 \quad \text{in lacA}. \]
\[ 7, 4, 11 \quad \text{tiny colonies on lacS}. \]

1B. \[ 1, 0 \quad \text{in } T(\beta, \gamma). \]
\[ 16+, 22-, 15+, 24-, \quad \text{lacS}. \quad \text{Better definition of } +1- \text{ but not quite clearly.} \]

2A. \[ 5 \quad \text{in } T(\beta, \gamma). \]
\[ 15-7 \quad \text{in lacA}. \quad \text{All-} \]
\[ 4, 14 \quad \text{in lacA} \]

2B. \[ 52-2+, \]
\[ 97-6+ \]
\[ 30-1+ \]
\[ 21-3+ \]

\[ \text{lacA.} \quad \gamma +1- \text{ definition good, somewhat better than } \text{ lacS.} \]
\[ \text{lacS.} \quad \text{conclude: Shaking is certainly deleterious to crosses!} \]
p11.

1B. (LaC 5.)  
3H+ : 31 -  
Too many + 7.

LaC A.  
94 : 15 -

2B.
To 10 ml T(0) add:

A. 0.2 mg dl-isoleucine and:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>.20</td>
<td></td>
</tr>
</tbody>
</table>

B. 1.0 mg dl-valine and

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>±</th>
<th>(Try adding leucine to this!)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>.02</td>
<td>±</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.05</td>
<td>±</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>.10</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>.20</td>
<td>±</td>
<td></td>
</tr>
</tbody>
</table>

c. .17 dl-isovaline

.12 dl-isoleucine

.02 l-leucine

.03 dl-valine

(optimal for Neurospora).

D. H.C.  +++

2:1 vol/ vol: isoleucine

++ best so far.

SW 5: Tween 80, intact RNA, all acid, Cozymase PCL -

++
Phenolphthalein Phosphate.

Prepare plates of NA to which Na Phenolphthalein Phosphate (Paul-Lewis; sterile) is added.

Select out A. (S10-7) B. (K-12) & C (B. subtilis 16).

After 24 hour growth, expose plates to NH₃ vapor.

A & B: show no change in color at any cone.

C: 100Y No change

200Y colonies become light pink

1mg. colonies become dirty pink.
Also:

Dulcitol  

V. weak  

Phenylpyruvic acid  

++

Cellulose  

--

Salezin  

--

Mannitol  

--

Note: very weak + fermentation of

Mannose & of mannitol can be

Revealed by selecting papilla of SW7.

These are extremely weak.
June 10, 1948.

Inoculate SW-7 and -8, 1 ml in open petri dish, 10 secs. Dilute 1/10 ml/10 broth, and spread 1 drop per plate of xylose + arabinose EMB.

1. SW-7 on arabinose; SW-8 on xylose.

2. Also, about 10 plates each, 1 drop whole culture spread on plate and incubated directly, 5 secs.

SW-3 / arabinose  SW-7 / xylose.

166. SW-7 and SW-8 are xylose-negative, as expected.

SW-7 treatment on arabinose was excessive + only a few small colonial per plate. No mutants. Suggest selecting for Xyl + mutants. Easily isolated + purified.

Check fermentation reactions on -EMB:

<table>
<thead>
<tr>
<th>SW-3</th>
<th>SW-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xyl</td>
<td>++</td>
</tr>
<tr>
<td>Ara</td>
<td>++</td>
</tr>
<tr>
<td>Blu</td>
<td>++</td>
</tr>
<tr>
<td>Bal</td>
<td>+</td>
</tr>
<tr>
<td>Lra</td>
<td>+</td>
</tr>
<tr>
<td>Mab</td>
<td>+</td>
</tr>
<tr>
<td>Sab</td>
<td>+</td>
</tr>
<tr>
<td>Manitol</td>
<td>+</td>
</tr>
</tbody>
</table>

Correlation between:

- + - glucan and xylose; ?

+ + - S. typhimurium fermentation

++ + - acrumbenil slower than

+++ + - coli!!

- in thick part of plate; + + elsewhere

++ ++ - ++ negative

++ ++ - ++ positive

++ ++ - ++ evisceral
June 11, 1948.

Incorporate 50 μl T2 reagent into agar + 1% lactose as indicated:
A. N2L buffer (Phosphate buffer) = N2L
B. " + .1% Na-formate = N2LF
C. Nutrient broth = NBL
D. " + Formate = NBLF.

A. 11. Make NA on each plate:
    \[ K = K-12 \]
    \[ S = B. subtilis \]
    \[ SW = SW-7 \]
    \[ W = W-400 (hec-0) \]

A. K: Colonies colorless or faint pink. 1 large dark red colony (223-1) (223-2)
    SW: Isolated colonies dark red.
    W: Colorless declined.

B. As A. K: Same to red but not mixture.
    SW: red white colonies in the colorless zone.
    W: All colonies declined; definition somewhat better than A.

C. K: Nearly colorless; All colonies of W & SW show up very well.

D. About the same as C. K: same pink. SW & SW somewhat more intense.

Test 223-1 + 2 in hormone medium for Lee-EMB.
1 is Lee- 2 is Lee+ (probably colony from SW-7).

See over:
Mix H₂O and straining NL. EMBLac

+ and - easily scored as each other's presence provided the plate is not too crowded, whereas are found the absence as colorless. The method shows considerable promise for the detection of non-fermenters.

Difficult traces should be blind in an attempt to obtain uniform coloration often - even in crowded areas, which would facilitate their detection.

sw-5

Y. Ck.
1 5 mcg  ++  = L. Bulgaricus factor.
2 1 mcg  +  
3 500 y.  =  heter. ++ (sw).
4 100 y =
5 20 y =

sw-7. Valine 0.2 mg/tube.

0.5 to + 0.2 mg L-leucine.

1. 1.0
2. 1.2
3. 1.4
4. 1.6
5. 1.8
6. 2.0

Nutrition of Sw. 5, 7.
Salmonella phage.

June 14, 1948.

Cultivate S-20 + S-21 in 1/2 overnight, in shaking.
Centrifuge raw medium, serum + pellet, supernatant. (Serum + filtrate)
Add 1 ml SF + 0.5 ml S-20 or S-21 to 10 ml broth.
Incubate 6-8 hours. Both are thoroughly turbid cultures.
(225-20, -21). Sediment bacteria. Test supernatant for phage by:
1) 1 drop "phage" + 1 drop bacteria (2) streak out phage + bacterial smear.

225-20:

1) large plaques noted in both. (May correspond to the phage attacking resistant bacteria?) - small plaques noted.
2) phage also noted.

225-21:

1) pattern of resistant colonies.
2) small plaques phage noted along streak.

Suspend plaques in water and streak out on homologous bacterial smear. [Could phage suspension should be filtered?]

After several streakings, pick from single plaques to:

Further cultures + recover phages. These may not be pure.

Sp-1 S20 small plaque
Sp-2 S20 small
Sp-3 S21 small