I. \[99^{51} + 1\] seems to point to a bias among \(i: b\) transduction and correlated with earlieness of swarms.

**Hyp.**
1. \(i\)'s start earlier for unknown reasons, but move at same rate as \(b\).
2. \(i\) readers get a great starting advantage at the same time, but there are differences in effective motility.
3. \(b\) becomes more of a selection when results in comparable ratios.

**Replica unpurified array of \(99^{51} + 1\):**

\[
\begin{align*}
&1001 A 1.3 = C 1.2 \text{ early swarms, i} & &\text{lysozyme/\(LT\)}
\end{align*}
\]

\[
\begin{align*}
&B 4.7 = C 1.2 \text{ delayed } i & &\text{all+}
\end{align*}
\]

\[
\begin{align*}
&C 8.14 = C 1.2 \text{ delayed } b & &\text{all} + 7, 3, 4, 7 + 5, 6 -
\end{align*}
\]

From repression, providing compare movement ofmot. age.

\(2000 - 847\) duplicate plates, 2 ferment.

\[
\begin{align*}
&\text{ - deam in mm} \\
&\text{A} 25-25 \quad 25-20 \\
&\text{B} 31-27 \quad 28-25 \\
&\text{C} 28-29 \quad 26-29
\end{align*}
\]

If anything, B, C > A better than the converse. These were isolated from different plates, and any difference maybe irrelevant to the present issue. **Hyp. 2** maybe excluded, but 1 vs. 2,3 cannot now be determined.

But see also 1030.
11/12
927 htr 2
94 x 106

10.7
10.8
10.9
10.10
10.11
10.12

3.2
2.5

4.5

999 - 4
999 - 4
999 - 4
999 - 4
999 - 4
999 - 4
999 - 4

11/12
927 htr 2
94 x 106

10.7
10.8
10.9
10.10
10.11
10.12

3.2
2.5

4.5
12/12/52

Add 1 ml to 5 ml ca.10^8 PLT2 in broth, Incub. at 37° 10 minutes.

Assay LT-2.

<table>
<thead>
<tr>
<th>Control</th>
<th>Serum (82)</th>
<th>ca. 2 decades in 10 ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)</td>
<td>(3)</td>
<td>at 1:100</td>
</tr>
</tbody>
</table>

Do a more careful test in this range:

Quantity of serum needed to prevent plaqunig (and presumably, secondary hyperagglutination).

12/19

Mix ca.1 ml 2x10^6 PLT2 + 1 ml 10^10 LT-2 + 10 ml broth

After 15 minutes add to equal volume of various serum dilutions, plate on EMB lar.

| 1 1:1 | Magnesium noted, small, may be reduced in number |
| 2 1:5 | ca.10^{3+} |
| 4 1:10 | " |
| 8 1:20 | " |
| 16 1:40 | " |
| 32 1:80 | " |
| 64 1:160 | " |
| 128 1:320 | " |
| 256 1:640 | " |
| 0 0 | ca.10^{3+} |

Note: clear plaques noted: 3 or "o," 1 or "1." No others!

Very high serum conc. will be needed to prevent cross-infection!
Dec. 15, 1952

12/14. Made ca. 5 x 10^7 cells in 10 ml 0.1% D. A. + Ca. A = W1/485  B = E64.13

| $\text{CaSO}_4$ | 1.0 | + | ++ | +++ | +++ | +++ | +++ | +++ | +++ |
| 2.5 x 10^{-5} | + | ++ | ++ | +++ | + | +++ |
| 3 $10^{-5}$ | + | ++ | +++ | + | +++ | + | +++ |
| 4 $2 x 10^{-5}$ | + | ++ | +++ | + | +++ | + | +++ |
| 5 $10^{-4}$ | + | ++ | +++ | + | +++ | + | +++ |

6PM, 1st reading 9:30 AM 12/15.

a) Start one ml N.A. 9.20 AM. Remember.
b) 110 PH
c) 6PM 12/16.

Results: 1024 A2 - 4, B63 - manual mix. cataniae in both.
w: few smaller colonies 05, A2, B2, A3, B4. Restarted. 11/16. suje

12/18. Repeat test. in T(0) as above. 1485/486.

| $\text{CaSO}_4$ | 1.0 | 1485/486 | B |
| 2 $5 x 10^{-6}$ | + | +++ | + | +++ |
| 3 $10^{-6}$ | + | +++ | + | +++ |
| 4 $2 x 10^{-5}$ | + | +++ | + | +++ |
| 5 $10^{-5}$ | + | +++ | + | +++ |
| 6 D(0) $10^{-5}$ | + | +++ | + | +++ |
| 7 D(0) | + | +++ | + | +++ |

(D) cultivate? - detritus ca.

(over) No dwarf colonies from any plating!

Stuck out at 986. No stem sem!

(over) Restarted 1/3.

1/8 AM.

1939 + 15 + 17
1939A + 15 + 18 +
2042 + 3 + + +
2090 + 4 + + +


No colonies of strain on tryptophane for 2090. 2090 seems to do relatively much better in broth than in agar.
Try β-12 on broth, again. No affect.

2090 - numerical but limited than the others in necessary.

of excited and unexcited necessary 2090, 1939A. 2090 An: increased

\[ \text{midurit at same slow rate penman but reached higher penman} \]

despite poor growth seen below from 2 for 1939 exp.

in T(0) 1939 EC4: B + W1939A, more pen Edwell

25, 12, 6, 3 ppm HNO3 to T(0) liquid.

1939A

<table>
<thead>
<tr>
<th>PP4</th>
<th>0</th>
<th>++</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>++</td>
<td></td>
</tr>
</tbody>
</table>

12/21. Results. A25, B
A25: stud
B36/2: normal ++ only
B25: some minute colonies in numerous ++

Retain these. all normal exp.

These rpts: fail to confirm Weid, Edwell, Loebelation.

Jecv

as received from Edwell (standard strain) W1939A co a mixture of

Halt and Hal. Both are highly stable, but Hal oxygen did some

alter papilla toward +. (Halt) + W2090 did not give normal Hal-.
S. Sendai 82771 is being considered for S1 studies on determination of phase. However, it appears to be remarkably weak. Attempt to isolate a smoother strain.

All isolates, rich from lyophil, are at least partly completely subject to nutrient agar, rendering H-serotyping difficult. In addition, H- is rapidly attenuated on solid medium. 0.75 for 82775. Look at other Salmonella epidemicos.

See 1024, 1035
**Multiplicity reactivation**

FA12: ca. 10^9  999 E3: "160/m^2"  Does this depend on multiplicity?

**Sw666**  12/17. Estimated titer is 2x10^9  FA12 = 10^9

1. Mix 1 ml E3 + 1 ml undiluted titer. Plate 1 ml on EM15 lac +
2. " "     "  1:10
3. " "     "  1:100

After 10 min at RT, add 1 ml sodium to 1, 1 ml indole to 2, 3
and plate 1 ml sample on EM15 lac, afterthought: also O2

EM1lac  Cal: pigm.  ind +
1  6,7  (0.015 ml)  2
2  2,8  (0.05 ml)  4
3  1,5  (0.06 ml)  1

Multiplicity reactivation probably does not account for the residual plaques.
12/22

All 1003: Strainout plaques. 4 to violate pure lines. An initial streaking.

- Mix. of clear and turbid plaques, both small; 2+3 also mixed, mostly.
- Large clear plaques, 4 small and larger clear plaques. For first purr.
- Pick well isolated clear plaques, grow on LT-2.

- Initial streaks, 927 and 928 wasn't lysed by any plaque. LT-2 was
grossly lysed. 666 showed only few-weak plaques on the.

Grow plaques on LT-2/2 in broth. All but #3 gave virus lysates.

a) Test vs LT-2, 927, etc.
   b) Add ca. 10^5 cells LT-2 to eq. vol. LT-22. Plate in 1 mil 22V4

at various conditions and 0. Three times is a presumptive

= 1/4 x 1 mil of diluted cells. All plates' equal volumes

1. No FA22, No 22V 1005
2. No FA22, 22V (10^2)
3. 10M FA22 10^3
4. + 22V 10^3
5. 1M FA22 + 22V 10^3
6. 257 FA22 + 22V 10^3
7. 257 No-22V 10^3
8. 46 M FA22 10^3
9. 45 M + 22V 10^3

6 of 5 x 2

Inoculate exp. to 22 protein
against 22V! Discern of
very high multiplicity of 22, this
may be adsorbing - interference!

Titers of V4: 12 x 10^8, 1 x 10^7 confl. 10^5. All plaques clear!

(From more accurate titration, were 10^8.)

Infectivities: LT2
- 927 x R R
- 928 x R R

(921)
- 128 x R S

x can also be
seed to reinit.
some smooth survivors of 22V + LT2 may have
Follow through serial transfer to give self-multiplying plaques until isolated
as PLT-22, 22V-sensitive, near lysogenic

On SW666 22V gave scattered plaques at 10^{-3}
(e.g., ca. 10^{-5}) Plaques not very large, with lytic
Restart on SW666 to get 22B6 - retention lytic actin + LT2,
now turbid plaques on SW666.
However, attempt to induce lysogeny on SW666 gave 1/4 self-sensitive
10^15. 1 ml cty 10^3, 10^4, 10^5 PLT22 + 10^9 LT2/ml (2 ml)

RT.

A

PLT22

10^8 count: 111 x 10^7 + V: 3 x 10^7 288 x 10^5

B

10^6 count: 120 x 10^7 + V: 0 x 10^7 2 x 10^5 (589 x 10^3)

C

plaque: 2 23 x 10^7 (1 strain) + V: +++ x 10^5

D

0 count: 129 x 10^7, with 22V: 6 x 10^5 1073 x 10^3 +++ x 10^5

Plate c 22V at various dilutions, also filtration & C.

A/r 1/2 PLT22 assumed 3 x 10^6 of plaque titre and "pertinent titre."

Results. Phage added was 2.3 x 10^8 Initial settin then 10^7.

Bacterial count was 1.2 x 10^9 containing 1.07 x 10^6 background resistant.

Phage added

A 2.3 x 10^7

B 2.3 x 10^6

C 230

D 0

\[
\frac{2.3 \times 10^7}{2.3} = 1.2 \text{ resistant bacteria per plaque former!}
\]

7 contaminated colonies appear at A \((10^7)\) acc 9. For all added unus!

Test transduction of FLV3 (224V) 1 ml

\(\text{Supp: no response}\)

all salt stable. Test lysogenicity after

purification: all lysogenic possible, exc. #1 (grows poorly.)

This is within lysog. nor sensitive.
Type of dysprosity:

Kiln 1 prep. in CHCl₃, streak on LT-2

<table>
<thead>
<tr>
<th>Type</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>8</td>
<td>22</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td></td>
<td></td>
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<tr>
<td>22</td>
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</tbody>
</table>

22 type is turbid phage.

6,7 were intact under in hemassay on LT-2

6, 7 = turbid phages.
10 c.c. transantuine. Resting and replated to LT 2.
All strains are lysogenic. #1 and 2 had possibly non-lyogenic components: E2 lysogenic.

E1 appears to be non-lyogenic, resistant to 22, 22v.
It still reacts with anti IX-XII. May bear "immune-1" type. Test for heresidinability.

By growing E1 in LT 2, 11/17 plasma was secured.
1066 E1 may thus be another "weak lysogenic". 8.
1093 B3, 1094 C1.

1066 E1 plated alone gave numerous small colonies

O(a) + FA Y3 gave 1 day + " "
+ FA 22, 1 ml. ca 300+ larger colonies

435 + FA Y3 : 1, 3, 5
435 alone gave 61

May be "intermediate" allele.

Reculturate. Small colonies may be being an added host's component.

Check these colonies (Strep)

1. 50435 sp. ++++++ ++ +
2. 1066 E1 sp. +++ ++ ++ +
3. 1066 E1 FA Y3 +++ +++ +++ ++ +
4. " " FA 22 +++ +++ # # # # # # # +
5. 50435 FA Y3 ++ + + + + +

+++ strong growth 11/16.
++ " " 48h, mild brothup. (important?) (over)
+ moderate "

Apparent monosomic may be weaker (correspond to intermediate ?)
50435 now may be monosomic. Check requirements relative if free. Compare.
240, 259
Submatrices of
10061, SW435
= 10061A 10061C
12/27/52.

X-ray counting A Notre Dame / U of Chicago
56864l

\[ \begin{array}{ccc}
0 \times 10^7 & \text{repeat} & \text{cal}^+ / \text{ml} \times 10^2 \\
92 & 53.61 & 36 \\
26 & 24.31 & 48 \\
117 & 3.7 & 12 \\
\end{array} \]

\( \left( 7.3, 6, 2 \right) \times 10^{-2} \)

Assay in large plate
61,70

\( 48 \)

\( 6.8 \)

\( \text{original stock} \)
64

\( \text{approximate theoretical point} \)

\( \ldots \) 0 is alternated ca 1 decade / 200,000
FA is diminished (?) from 28-12

\( \text{In view of tremendous doses given, the same does not appear to be promising} \)

C still held out: all stable salt.
Incidence of hypersensitivity: 10/12
ca 12/12/53

SW948 - FF9.

+ FA 9, 10, 12 — gave no tox. except
leptomeninges 12 - x 948
a few survivors 10 - x 948

FA10 - x 948 2B, 2a  FA20 - x 948 2a.

SW948 grows smoothly in broth but gives very rough colonies on
NPA. Nevertheless, these react strongly with anti - I - II; IX XIX.

Check adsorption of PT 22

see 1045

Where are results of 22 - x para A - 0?

0
Dec. 24, 1952

11:35 PM

LT-2
Total (x10^7) PL 12-2 dil to "10" "Continuity"

A: 0: count
B: 1 ml + 1 ml 78,78 x10^6
C: 1 ml + 1 ml 85,88

D: plaque assay (broth plates; sal sus LT-2: x10^7: 67,73; c floor cell 130)
dil in terms of original 4th

c1103
condition of cells may affect the quantitative recovery of [x]
the memory needed cells or other inhibitors.

No effect of multiplicity or survival. The actual ratio: 4/3 was
128/128 and 130/130/
130/128 in B and 130/82 in C but amount actually
adsorbed was not established.

Detail in B, C:
c1 85 plating, 40mm. circular contaminated. Many solitary and
mosaic-plug formed. Formed these. Repeat to 22V.
c2 88 repeat to LT-2 Hemanim.

B (x:1). Many colonies have a central clearing difficult to tell whether
definite plaque or not. Obvious plaque, in 17/18 almost all others
have central plaque.

Small central plaque are multiplicity?
Large plaque delayed or right?
B+ Lysogenic

21 non-lysogenic
57 lysogenic

Of these, 17 showed chronic plugging and are therefore contaminated.

On replication, 8 additional were spraying sector-plugoned

Strain 1 remains lysogenic for purity (15 can be picked)

25 contain Ori colony 27 not
21 non-lysogenic

\[
\frac{21}{78} \text{ non lysogenic} = 0.269 = e^{-1.3}
\]

Actual ratio 13:9 = \frac{130}{125} = 1.04

\[\phi:13\]

C: 10-4 ca 10.

C2: 7/88 non-lysogenic = 0.0795 = e^{-2.5}

Are these non-lysogenic? Test for sensitivity (allure 220°)

Also test non-contaminated lysogenics.

Of remaining 81, only 4 are strongly contaminated

A: non-lysogenic on PLT722

B: study out non-contaminated lysogenics.

Preliminary test of C16 strains were picked (7 recent 220°)

All showed a few lysed colonies on streaks. Conclude that all are actually contaminated.


UV'd FA22, protect, vs. 22V?

1. Dilute stock FA22 at 1:30
   UV A 20 minutes (10 ml) at 50 cm

   Add 1 ml to 1 ml LT2 (10 hours broth)
   Plate out \\
   UV at $10^{-5}$

0: LT2 & FA22 + 22V, $10^{-5}$: 5 survivors

A: LT2 & FA22, $10^3$ plaque on LT2, $10^3$ survivors; 22V at $10^{-5}$

B: plaque:
   $0 \times 10^5$, $0 \times 10^3$, $0 \times 10^1$

Survivors 22V: $0 \times 10^7$, $0 \times 10^5$ (check these two lipoprotein).

Note: Return killing (decay of the broth, increase vibration?)

UV'd LT22 assume to have lost its protective function, but the dose may have been excessive. Check to maintain ability.

C.5) As above A, FA22 UV 10 min. Enough

K.D. FA22 UV 0 min. 10$^{-6}$ plaque on LT2, 58 x 10$^6$, recovery ok!

E: no FA22 16 min recovery.

F: 22V UV 10 min. assay. (viruses of 1/20 diluted)

at $10^{-5}$, C, D, E $10^3$ survivors with UV. 10$^{-6}$ UV, see no to high survivors in the control. Y.D. indication that this dose also removed protective power.

Diluted phage is killed by UV much faster than broth, as one should expect.

K: 10 plaque survivors. See L-M for more thorough essay

Any non-plaque lipogenic? 2 lipogenic was not clearly self-plaque in vaginal

Include these.
B-13

8 "non-contam." colonies picked out. 6/8 showed 1-5% phage
colonies and are therefore contaminated. 2/8 showed no overt
phage. Replicate for further test.

1. colonies evidently not lysogenic. Perhaps, first whole batch also
   contaminated.

2. 

Conclusion: all sensitive. Initial scooping as
   lysogenic; non-contam.

C-B

8 out of 10 colonies stained out. 3 out of 8 clear.

Replicate

end test, apparently pure lysogenic (might happen, up to 2%
of the 3 "clear" plates possible non-lysogenic).

2 single colonies not seen. No sep., lysin noted in materials.

Thus, multiple infection may give some uncontaminated lysogenic clones

B-A 15 tests 10/15 single LP22 S B are not 22 S (try 22 V?)

1 self-phaged. All lysogenic (inhibited?)

C-A 8 tests: 7 22 S 1 22 R = non-cont lysogenic (reduced).

Thus is too high, considering
non-propagation. Some infected cells = pure sensitive clones?

Save B 1/2 and C 1 as
1009 BA and 1009 CH.
1009 BA, 2A. 3eim person studens.

Gr. hypogynicity i a typical "hypogynous" case.
This experiment is faulty for using 22V/272 rather than 22V/27-14 in the last step.
Important comparison:

$L_A - M_A - L_C$

Note $M_A \gg L_A$ although 5x as much FA was used.

Absolute counts seem rather high also, presumably if FA used!

Transmission by 22V may be ignored.

Survival of transmission

\[
\frac{L_A}{L_C} = \frac{248}{113}
\]

Survival of population

\[
\frac{L_A}{L_B} = \frac{400 \times 10^5}{10^9} = \frac{4}{100} = 0.04
\]

\[
\frac{878 \times 10^5}{10^9}
\]

Expected surv = \( \frac{\varphi}{L_B} \) = \( \frac{10^8}{4 \times 10^7} \) = \( \approx 2.5 \)
New LT-2 mutants
UV FA22

ca/2/31

SW9/14: qesc UV (ca 50 xsec/plate)
del 13 plates

del 5

del 10

1 shoot del - (SW950) and Hal - (SW951)

SW950 also had some "fuzzy" colonies as well as shoot del -
these => firm +

SW950 = SW4/14 (LT-2) del -

SW951 is clear +, not susceptible to selective medium although
irregularly reoccurs

Response of SW950:
A: Spirit +
B: 
FA22 1 ml 2 x 10^2
C: FA22 (1:30) see 1009/4Y 23 papillae
D: FA22 UV (1009 N) 9 papillae + 59 plaques

Thus FA22 behaves like FA10/12 in response to UV.
UV'd phage foci (papillae). Though it does not infect a protot
cell remain stable.

A: Lp^3
B: 20/20 Lp^+
C: 9/9 Lp^3

It can be inferred that FA22 can also
be UV'd so as to separate phage from
transduction.

SW950 / ET196 del - in a 15 plate, 1 sectored => SW952

This is almost, like 151, and maybe suitable only as an uncontrolled
mutant.
Add (10^3) PLT 22 (in 0.1 ml) to 1 ml heat-killed broth (10^7) 9:00 - 9:30. Plate 10^-1, 10^-3, 10^-5 in SW950.

A: ca 20 x 10^5
B: ca 100 x 10^5
C: ca 60 - 80 x 10^5 (control) not desire at 10^2
D: ca 100 x 10^5

614 sperm for LT-22

Unfortunately, plates examd.

Consistent with: 950 > 918 > 694 > 0. Notes seem unaccountably lower.

Has antigen been destroyed? Incubate should use live cells for adsorption, then kill. Each labeled resp. aggl. (slide) c. 50 x 50 squares.
2/11/53

Overnight broth cult. boil 10 min.

Add ca. \(10^6\) FA22 in 0.1ml to 1 ml \(10^8\) killed bacteria.

Rinse up to 10 minutes. Add 1 ml \(10^9\) Assay (1ml, 0.1ml)

Assay, 1 ml

\[ A \]
\[ 67 \]
\[ 94 \]
\[ 48 \]
\[ - \]

270

Expt. 1.7. Use higher dilutions.
A1: 38 x 10^8 = 1.0 x 10^8
B: 46.3 x 10^8 = 4.2 x 10^8
C: 3 x 10^7
D: 1.4 x 10^7
E: 1.1 x 10^7
F: 1.3 x 10^7
G: 1.0 x 10^7
H: 0.8 x 10^7
I: 0.7 x 10^7
J: 0.6 x 10^7
K: 0.5 x 10^7
L: 0.4 x 10^7
M: 0.3 x 10^7
N: 0.2 x 10^7
O: 0.1 x 10^7

Notation - Translation

1/14/93

1/14/93

10/10-5:10

10/10-10/17/2

10/10-10/17/22

pH 9.0

pH 9.0

pH 9.0

pH 9.0

10/10-10/17/2

10/10-10/17/22
check plaque type in LT2
22V1-4 : all lytic, similar action
1012 B suspensions : all turbid
Stokes PLT-22 : turbid
2 - clear plaque : lytic
2 - turbid plaque : turbid

Especially minor of 10/12/3, clear plaque must have been contaminated (mycoplasma, hemagglutin?)

Replica tests of B: 1 lysogenic colony on two plates.
Overall result is almost negligible transmission or infection with PLT-22.

<table>
<thead>
<tr>
<th>FF</th>
<th>4</th>
<th>FA ×3</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>9,11</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>H</td>
<td>6,6</td>
<td>5 (0.05)</td>
<td>5</td>
</tr>
</tbody>
</table>

(v. effective transmission. This titre seems very high!)

Apparently stage was insufficient. All transmissions were normal, but ascertainment is obscure. Also note that transmission defect may have been too heavy.

**SUMMARY.**

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>4 x 10³</th>
<th>PLT-22</th>
<th>3 x 10⁸</th>
<th>22VR R</th>
<th>10 x 10⁷</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

22VR (δ phase) = 4 x 10⁷ / 4 x 10³ = 1% (cf.)

<table>
<thead>
<tr>
<th>SW666 + FA46</th>
<th>sal+</th>
<th>Flav−</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−1</td>
<td>−</td>
</tr>
</tbody>
</table>

| 928 + 11      | −1   | −     |
Host adaptation

FA 21, 22, 41A, 13, C

FA 41 = FA 21 plaque resolution on LT-2.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FA 22</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>FA 22</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Y1A</td>
<td></td>
<td>100 x 10^4</td>
</tr>
<tr>
<td>Y1B</td>
<td></td>
<td>50 x 10^9</td>
</tr>
<tr>
<td>Y1C</td>
<td></td>
<td>20 x 10^3</td>
</tr>
<tr>
<td>Y1E</td>
<td></td>
<td>10 x 10^7 (turbid)</td>
</tr>
<tr>
<td>Y6G</td>
<td></td>
<td>100 x 10^7 (turbid)</td>
</tr>
</tbody>
</table>

---

log ratio, essay on Y X

adapted to

A
B
C
D
E
F
G

Y
2
4
4
4
4
7
-1

---

The adaptation of PLT 22 to sw 66 is therefore reversible and is presumed a host-induced adaptation.

It also affects 22N, which gives turbid plaques on sw 66 when adapted, but does not induce lysogeny.

Note that FA 22 has a deficient of Y while the re-adapted phages FA 41 have a deficient of Y. This suggests a dual effect, part reversible, part not (host-adaptation, virulence). This may also account for previous impression that host-adaptation was not reversible.

---

the test lysogeny is pure Y-! all show some Y- interaction with sw 95D! (suggesting that 95D is lytic for 666!).
1/3/53

\[ \text{FA}46 \times 666 \text{ Probable lysos. No Tox. S.} \]

(FA45/SW618)

(long)

9/28: 4 \% K 2 as ni. 3 plates; no swarms.

A.

Isolate 3 of the K 2 's. Also pilus empty, nearly again. VICB, LT-2

\#2 and \#3 or. Show typical PLT2 plaque. \#1 did not.

1/9

Retest isolated colonies: all lysogenic (PLT2 type)

\[ \text{FA}43 = 22V/LT2 \quad \text{FA}44 = 93/SW950 \quad \text{FA}45 = 43/666 \quad \text{FA}46 = 45/618. \]

1017: FA43 \times 953 \rightarrow H+

And that for FA41/44 missing of H+ from 22 \times 950.

1006 FA43 \times 435 \rightarrow H+ and low yields.

\[ \text{FA}43 \times 435 \rightarrow \text{H+ and low yields.} \]

\[ \text{FA}45 \times 435 \rightarrow \text{H+ and low yields.} \]

see above 1017
1/19/53. Plating 300 PLT2 + SW954 ± FAS3
+ FAS3 300 plaques, all clean.

100 nl 1 ml confluent lysis/spot of plate; clear plaques on remainder
+ FAS3 2 x 10⁻² → 0. Some presumptive particles are involving.

In preparation S3A = FAS3/PT2. Plaques very small, scarcely
discernible. Titers 100 - 10^⁴ x 10⁴.

D) 1-2 resistant = SW954/FAS3 + PLT2

954 + FAS3 seems to show some possible delay. Restrict to
separate possible components.

E) SW954, 956 not dysgenic /952.

Some very vague interaction of 952 - 958, 958?

F) 954 gp⁺ PLT2 showed no lytic response to FAS3A or 53A -
PLT2. (v. h. inhibition of growth on spreading noted).
& grow FAS3A (53/PT2). Titers (SW954) 6/10^⁸
January 15, 1953.

Amphorae received (duplicate) 1/14/53 as #1, 2, 3 respectively. Derived by both and Speir's conversion as "cosmopolitan" Salmonella phasea. Label FA 51-3-

a) Test mycotic mutants. All behaved alike except as indicated:

sw9920 5
666 l
648 927
927R1

sw948 had background regrowth to all 3.
1. sw688 5. 927 3 showed no response to any.
2. sw930 had considerable background for 4.

3. Florida 3
52AR
London 5

b) Plate #1 ml on seed in sw666, 912.

c) Select resistant mycotic of those mixtures. Enumerated:
1. LT-2/51
2. 948/52
3. 775/52


C1 was noted to show full lysozyme resistant strain from 53 adjusting FA 22.

Repeat C1 is not lysed by FA 22 + FA 53, not separately.

a) Obtain C1 lysogenic!

C1 = sw994

C1 and C2 smooth hydroxically smooth (IV, XII); (I, XII resp.)
C2 is not susec. to PL 22 + FA 53.
A. Titrate FA22 (stock) in SW952, SW953 in EM632, 0(NH) 0(N)

Titration required for further studies.

1029L1B. Showed FA22 to have activity of 100. \( \frac{1}{1} \times \frac{1}{10} \times \frac{1}{10} = \frac{1}{100} \text{ ml} \). ca 100,000/ml.

(also 22U, and UV 22 and check fluorescence for cal, 7-7)

10126G. Showed \( \frac{1}{1} \times \frac{1}{10} \times \frac{1}{10} = 50,000 \text{ /ml.} \)

If ca. 2000 previously assayed in SW 925.

FA22 D(meth)
cells have to be washed for D (Hist)

SW952

1001 ml 30 (count may be ones, higher - plate somewhat ca 20,000

> 7/100

FA47.1ml > 30 spread so!

SW953

FA43.1 3 326. numerical transcribe for
FA44 2
FA47

EH1/Ehgaltry

SW952

FA22 11.06 7/100

102 1/54

0 5, 2 (small, delayed)

1009 N 8+3 delayed 25 plaques
11 ml 3 10+5 21 plaques

Thus H+ / Ca++ = ca. 10:1 for SW952.

SW953 has relatively poor response
D/meth) plates:

Sub 40 = 7
" + Hsubcath, 8
+ FA47 ca20 (sm.)
+ FA4715 10
+ FA52 8

(presumably residual FA22)
January 16, 1953

A. B = SW950, Yhoma culture.
B. B 2ml + FA22 ("10") 2ml
C. B 3ml + " 1ml (4.4)

R.T.

As assays involve dilution of FA22 1:300 and 1:1000, 
set up only practicable for A, B.

1. A, B, C at 10^-7 for survival
2. A, B, C at 10^-5, 10^-6, 10^-7 with FA44, 10^-1.
3. B, C at 10^-6, 10^-7 for plaque in SW950.

4. A 1ml O (with)
  B 1ml O (with) + FA44
  C 1ml EM120

7. A 1ml EMT20

\[ A) \frac{106,1\times 10^6}{2\times 10^4} \]
\[ B) \frac{92,1\times 10^6}{78,87\times 10^6} \]
\[ C) \frac{1,0\times 10^6}{3,6\times 10^6} \]

\[ \text{Phase ridder: 4,4} \]
\[ \text{Phase ridder: 2,2} \]
\[ \text{Plague ridder: 2,1} \]
\[ \text{Plaque ridder: 2,1} \]

Summary: Initial Culture: 1.2 x 10^6 + PLT22 0.97 x 10^6 = 2.1 x 10^6

A. FA44 Surv.: 2.1 x 10^5

B. FA44 Surv.: 2.1 x 10^5 = ca. 10^{-4}

C. FA44 Surv.: 2.1 x 10^5 = ca. 10^{-4}

Add PLT22, calculated: 10^9 ______ 3 x 10^9

Why discrepancy between B and C?

C was allowed to progress only slightly longer, but FA44 is 50x too low.
\[ A = 0.02 \text{ ml FA 22 Emulsion; .02 ml D (meth)} \]
\[ B = 1 \text{ ml FA 4710} \]
\[ C = 1 \text{ ml FA 43} \]
\[ D = 50 \text{ ml D.1} \]
\[ E = 50 \text{ ml E.1} \]

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If 3/6 no accessory.
4/8 lower yield.
Cetyramine

Cetyl Trimethyl Ammonium Bromide (Cetramine). Rec'd from Dr. Tim (Behrert + 1/4/46 — spmd.) Acc'y Bradley & Boyd.

Inhibits phage adsorption.

Mix 10⁴ PLT + 10⁹ swiss.

Add 1 ml successive dilutions of CTMA, plate 1 ml.

1. 1 ml 5% = 5/10000 ~ 10³ bacterial survivors

\[
\begin{align*}
1 \times \frac{1}{5} &= 1/10000 \\
1 \times \frac{1}{5} &= 1/5000 \\
4 \times \frac{1}{5} &= 1/2500 \\
5 \times \frac{1}{2} &= 1/500 \\
6 \times \frac{1}{2} &= 1/100 \\
7 \times \frac{1}{10} &= 1/10^6
\end{align*}
\]

Not advisable for limiting cross-infection.
952. \(Hfr-Lac^{-} \times HfrP^{+}\), Abandon

953. \(Hfr-Lac^{-} \times HfrLac^{+}\)

955. \(H310 \times 1895\) \(\frac{1}{12}\) Malu, \(H313\)

But appears to have segregated already in previous efforts.

\(H310\) then muted to give very high yield \(x^P\)-
\(H310\) segregants: \(2\) each \(Lac^{-}\), \(Lac^{+}\) are \(F^{-}\). Test more extreme pools! \(\Rightarrow\) Then \(10^{+}, 5^{-}\) all \(F^{-}\).

956. \(H311\) (Mot2+) \(\times Hfr\). No Malu. Recombination not perfect.

23 Lac\(^{-}\)tested: all Mal\(-\)! (Very few Mal\(+\), but some found).

Abandon all there.

Continue \(H310 \times\)

\(Hfr-Lac^{-} \times Lac^{+}\) ... (1940 \(\times\) 1953 / EH13Lac...)
958. H245 x W1922. Some Hfr Lact
Hfr F+ Hfr

Hfr F-
964 H310 x W1607 mEHS lac. 2/24 lac+
Mal- sr Mal+

3 lacv. 2 Mal+ 1 Mal- (H322)

and hemizygous lact-! (note H310 is Mal-).

Superseded May 1057
July 4, 1952

Summary of Hfr x diploid crosses etc.

952. Hfr lac- x Het lac, EMBlac, occasional lac- (balanced) but mostly lac+ recombinants. H3/6 = Mal- lac- TL-  

\[ \times 1895 \times 167 \]

953. (H2675 Mal-) = H312 prot. x W1895 m EMS Mal.  

Not ready yet \( \rightarrow \) H318, 3/19 ! Should be segregated.  

Mal+ are TL+, Causa Mal-  

(mostly lac+, Mal+).

955. H310 x W1895 (1895 x 1177 medium, TL- Mal- lac+) EMS Mal.  

First trial gave \( \frac{1}{4} \) Mal+ H313 lac+ +4 Mal-  

Second: 0/24. Best H310 itself in Hfr? \[ \text{Maltacv?} \]

8/1.  

Recheck Hfr x F- \( \rightarrow \) F- (haploid) only.


gave numerous lac+, 6/6 dip were lacv MHly Mal-  

Rare Mal+ 5/6 Mal+ lacv  

Further tests needed, but presumably may mean that elimination is not bypassed in 1n x 2n (still for Mal).  

H320

A: Mal- Check for hemizygosity

B: Cross segregants
958  H245 x W1922
TL Lacy Mal-
EMSHal. undetermined
Male isolated. Test supports for mutation, 176.
H321

960  TL
H316 x W1895
EMBMal. Male lacy Mal - for testidomlycan Mal!

959  H295 xc. Cantamine
To be done

a) Further tests on 955: for less Mal-pure (is Mal
ever eliminated?). H310 itself may be hemizygous?

b) Segregation of H313 = recovery of Hfr?

c) Transmission of Hfr to Mal+ progeny?

d) Transmission of Hfr in H316 x Hfr?

959: H295 recAdamiss: H317 lp+ R. lp2 R segregating?

obtain Mal- recombinant for comparison, repulsion?

954: lac+ R recA from F+ x F-.

957. What peculiarity of \( \lambda /1827 \) can be demonstrated?

On gross test, \( \lambda \) did not recombine.
2/22/53

kunzendorf. G145-52 = A E. Single colony picked and multiplied = A1 = SW 961

2/23. Dissolve A into serum tubes:

k1, k6.

After 48 hours, k1 showed rough slabs which spread very slowly. 2/28: spread through.

k6 grew out and filled the tube = A/k6. Rough + heat antigenic.

Quieter uniform A/k6 except c ≤ 1,5/k1 but not 1,5/k6) or 1,2.

(over)

2/22. Dissolve A1 on plates of k1, k6 again.

A23: Bulbs on k6, not on k1—slowly overgrown. (Surface spreading.

P2.3 pick = D.

slab spread may obscure bulbs. Satisfactory. Than tubes.


1 small rough bulb on k1. Remember to try to pick c into 4 tubes.

C = cholera scis: c = #153

D = A1/k6 plates. Y uniforms /3 small plates.

Y mass cultures all react: c: + k1: +, k6: - r3 slide test.

use D3 as strongest reaction and cut single colonies.

Each of Y colonies react: c: +, k1: +, k6: - r3 slide (c = 0)

Prepare broth culture for testing. Dose D1 mg. k1, k6 E:

c very smooth, though k6 is slightly inhibited in k1. Strongly inhibited in A. Difficult to spread. 2/18 still not spread.

E: one plate showed two rough bulks. Pick to necessary. (May have undergone two steps of selection)

sw)

D1 = 958
D: More in k1, k2 55: frac of kbb removed; k1 in 48 hours = D2
2/6D3 k20D2 in k1

Titrate D1, living of heated 58° 1 hour & formalized.

<table>
<thead>
<tr>
<th></th>
<th>Living</th>
<th>Heated</th>
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<tbody>
<tr>
<td>c:</td>
<td>1000++</td>
<td>1000++</td>
</tr>
<tr>
<td>k1:</td>
<td>50+++</td>
<td>50-</td>
</tr>
<tr>
<td>k2:</td>
<td>100++</td>
<td>100-</td>
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</table>

Repeat

<table>
<thead>
<tr>
<th></th>
<th>Living</th>
<th>Heated</th>
</tr>
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<tbody>
<tr>
<td>c:</td>
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<td>1000++</td>
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<tr>
<td>k1:</td>
<td>100++</td>
<td>100-</td>
</tr>
<tr>
<td>k2:</td>
<td>100++</td>
<td>100-</td>
</tr>
<tr>
<td>c:</td>
<td>1000++</td>
<td>1000++</td>
</tr>
</tbody>
</table>

Previous k20form for c: 10000xx

confirms notion of kummerdorf = 1.5, x... c, x... with x compound absent in other 1.5 sera. (cf. buffin serum). Heat stability makes somatic antigen smile, but reactivity of living cells is much better than formalized. Some type is recorded by selection in kummerdorf rendering.

Titrate buffin serum: D1 living

<table>
<thead>
<tr>
<th></th>
<th>1:80</th>
<th>1:100</th>
<th>1:200</th>
<th>1:500</th>
<th>1:1000</th>
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<td>++</td>
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<td>++</td>
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<tr>
<td>c, ++</td>
<td>++</td>
<td>++</td>
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</tbody>
</table>

Start buffin is even more satisfactory

Same (titer of 1:500)
2/23-4. B1 (not pm) into tube of k1, k6 SS:

overnight: A1 k1  k6

B1 slow diffuse spread + + + near end of tube

2/25. Titrates D1, A, C: (1 hour 30).

A.  

\[
\begin{array}{ccc}
\text{c} & 100 - & 5000 - \\
k1 & \text{500 ++} & 1000 ++ 2. ++ 5. ++ 10. + & 20. + & 1: 10,000 \\
k6 & \text{500 ++} & 1. ++ 3. ++ 5. ++ 10. ++ 20. ++ & 720,000 \\
\end{array}
\]

C.  

\[
\begin{array}{ccc}
\text{c} & 1000 ++ 10. ++ 100,000 - \\
k1 & 100 - & k6 100 - & < 100,000 \\
\end{array}
\]

D.  

\[
\begin{array}{ccc}
\text{c} & 1000 ++ 2. ++ 10. + \\
k1 & 50 - 100 - 200 - 500 - 1000 - 2. - & < 50 \\
k6 & 50 - 100 - 200 - 500 - 1. - 2. - & < 50 \\
\end{array}
\]

of B1 at 1:180, 1:500!  Yields: ++ (k1 1:50, 1:100)

Ax to C++ k1++. still shows while aggl. from est. from streak of D1. CF heat killed cells (sanitized compound?)
2/27 G. Mix cells and treat with bovine 10% serum.

<table>
<thead>
<tr>
<th></th>
<th>C:1:1000</th>
<th>C:1:500</th>
<th>C:1:100</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW958.bv.</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Heat</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chondrosarcoma 153 bV.</td>
<td>++</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>D2</td>
<td>++</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>LUV.</td>
<td>++</td>
<td>++</td>
<td>++</td>
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</table>

The factor is also present in 153, presumably diluted by a non-immunizing serum. It has been substantially eliminated in D2. The factor is presumably absent from chondrosarcoma serum which migrates readily in Kurgendof serum. It is heat-labile (presumably H+), but also formalin-labile.

Test serum at 1:50 with D1 being
- Bovin 1.5 (153) and 5 (bovin absorbed at 157) ++++
- All others negative: H, K, F, H, K, 1.2; human, d., 1, 2, 3 (bovin)

To select 5% only phases from C:1.5, presumably should use 1, 2 serum.

"Phase stability" of jenema may be due to similar concentration of bovin - 1.5.

Effect of formalin (Add 5% formalin to D1 cells)

<table>
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<tr>
<th></th>
<th>C:1:1000</th>
<th>C:1:100</th>
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</thead>
<tbody>
<tr>
<td>LUV.</td>
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<td>++</td>
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<tr>
<td>form.</td>
<td>++</td>
<td>-</td>
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</table>
Further questions:
1. Does the explanation of anomaly (cf. 45-47)?
2. Reversion of C
   a) 958 appears to be stable in C (Colindale) SS. cf. D3.
   b) Does Colindale C inhibit migration of 961: tested 1/80
55.
3. Do C' present in Colindale C serum (not previously diluted with 1,5, etc...)
support the former hypothesis? If so, C' reagent possibly best prepared by
absorbing C' with D3. Absorption of bible serum with C, q.s. para 1,5 would be less safe.

Misc. Tests:
E: 153 = reagent in bible serum (unify C')
961 in C (Colindale)

Titrate in C, bible:
(blood c -) 902
(serum 958C)
80
958C

<table>
<thead>
<tr>
<th>SW961</th>
<th>C1:1000</th>
<th>++</th>
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<tbody>
<tr>
<td>1,5</td>
<td>bible</td>
<td>1:1000</td>
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</tbody>
</table>

980 ++
961 ++
3/4/53. Stability of $\phi$ phases:

- 3/8/53: no

Other reasons:

1. 1,2,3 bins $\rightarrow$ 24 hrs. survived through

2. $k_5, k_7$ (pam 278) $\rightarrow$ 2-3 days $\rightarrow$ (k5 slightly down)

3. $k_3$ $\rightarrow$ substantially improved in 4 days: couple looks

   "k_2, k_3" remain probably preferred.

   (try Edwards 1,2. if so!)

   However, k_5 and k_7 are "effective reasons", may

   still have some residual components. (agg. titer < 1:50)

4. 961/1,25 (157 reasons): survives about equally prompt

   in k_6, 12 Edwards, 1,2,3.
Fresh stocks of 0901 received from A. Felix. Also test SW542, in adit, and SW556 succeeeded from hypsoch (0901 from Kauffmann and Edwards respectively).

After 6 weeks, 0901 Fink 1-2 remained stable 4 days. On plates, (1 each) #1 stable; #2 gave 1 swarm 4/86, 2d 7/24.

A: SW401 1 swarm
   2d plate: 7 swarms: (2)
B: Both

c: SW452 0 swarms 15/plate; 2d plate: 1 swarm: (2)
D: SW456 1 swarm

All remaining about equally stable (ca 1 swarm/2 plates)

E: 0901 #1 + FA22: 8 swarms after 24 hours (control 0)

V: numero trails
48 h. 1 sw.

F: 0901 + FA9 (SW666) 3 swarms numeral trails
0901 + FA12 (SW682) 4 swarms numeral trails
motility / f

10/22
breeds both sets 66 g, 067 g.

overnight: motility not diffuse but from coalescent swarms

---

C - D: single colonies as above.

W6 w1678
C1-3 "smooth" 4-6 "rough".

10/11 overnight:

C spreading initially rough and patchy, later different from

local and outgrowing

D   "

10/27

All reached bottom except 04

Second passage: all reached bottom, ca 24 h.

A. 3/15/53

Student in M. A. Purified ascites to H2B. A compatibility test

<table>
<thead>
<tr>
<th>X876</th>
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<tr>
<td>C1</td>
<td>+</td>
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<tr>
<td>2</td>
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<td>3</td>
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<td>+</td>
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<tr>
<td>10</td>
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10/15

Grown in broth together 74 h.

Grown separately

plated on EMS loc.

LO

10/22
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<th></th>
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<td>+++</td>
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<td>c3</td>
<td>+++</td>
<td>++</td>
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<tr>
<td>c5</td>
<td>-</td>
<td>+++</td>
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<td>1</td>
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<tr>
<td>D3</td>
<td>-</td>
<td>4</td>
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<tr>
<td>c6-o</td>
<td>+</td>
<td>+(+</td>
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<tr>
<td>(58-161)</td>
<td></td>
<td>+</td>
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<tr>
<td>D1-o</td>
<td>++</td>
<td>1</td>
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<tr>
<td>(W1678)</td>
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<td>1607</td>
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D4: + T

- D3 seems to be F-, but also sterile.
- D2 is poorly fertile, not F-

Analyting and F test:

209: c2, c3 seem F-
1177 x 2209
1876 x 2209  20
1177 x 2207 (1876)  40
1877 x 2209 (1876)  10  3
1177(2207) x 1607

2207 and 2208 are fumigated by W1876.
4/6/53. 6 cultures 58-161, 407 W/678 and through mortality tubes (3 pass) 3 and 1, resp.: mostly adhered.

58-161: W2207, 2x08: F-, noninfective, infectable
W2206 F+ nearly Hfr; infective. Not studied for infective. (See TCN) (penicillin S R+)

W/678 W2209 F-, non-infective
3/1
Impure fury-A (5VA) from purified 26 phase of 3VA.

3/13/53 P: 5VA - xC72 < 24h → d = 1.2

891x → 5VA. Leave overnight. → d

(5) 957x → 960x → d

Due heat killed, unpurified, into d + 1.2 for possible 26 phases.

3/18. No 26 phases.

Repeat 3/18/53 aqueous mixture of 891, 957, 1 in d = 1.2 xenon.

3/19/53. Swam in S (in a 1.2 tube). Others (2 d = 1.2 each). No


3/20/53. 123S survived. 3/21. 26: purified, no

swam in 26 in 24h. Need to Edwards as 5w99.

sw999/26 = 999B! mates 26 ++ 1.2 ++ 1.5 ++

2 - 5 ++.

New phase is 26, 1.5... or mixture. Mixture.

Of: sw999

999B (not pur).

sw999 ++ ++ ++ ++ ++

5/5 single chance

Same same way. sw999 apparently acts fairly specifically in 26

Still, monitor in 1,555 for further relation.

sw999 and 999/15 xenon still work in 26 in 1,555, and 1:1030 wet

are not inhibited by it.
A. SW738 (1:2 sec) x FA40 (seeded a:1.5) [2; enx serum 5s]
B. x FA3 (altered c+1,7) [1]
C. SW676 (2.33) x FA22 (1:1) [c+33] 5s 3s
D. SW78 (1:ex) x FA40 [c:ex] 5s 3s
did not grow in serum 2/28 grew fairly well
E. SW676 x 14-21 (1:12) [c:12] moderate spread in medium
- control (14 days old)
- medium: 3/4 up buds, continued slow
- growth 3/3 all were - x: 4
F. abymu 1+2 x FA55 [c:12] 56 (-12) [c:12] No buds; all control 3/3
G. x 57 grew in same medium 3/3
H. x 57 [c:enx serum 5s] all still - 2/28

2/4/81. A. control and test show similarities but no swarms.
B. 
C. control: no spread
D. after emulsification, a:

J. FA54 x SW871 (-1,2) 3/12. Spread throughout, yes/no.
K. " 960 " control: unwashed.
L. (559 strain, slow affer) 1/2. Slow spread, yes, not control, - all control 1+2, 1+2, 1+2, (3 sec)
M. FA50 (SW546) x manit. 6 (500-51, a:1.5) [a/5]
N. 3/2. Slow spread, yes, not control, - all control 1+2, 1+2, 1+2, (3 sec)

See 1/28

*Note: (2) serum seems to restrain altered c+1,7 but not control (1,5)
(1 1/2 sec)
A - faild? Needs multiple replication
B - Probably 5 has anti-7

C - $i:1,2 \rightarrow z_{33} \rightarrow c:$
    Save one as 102.3C1
    Best evidence so far that z_{33} is a phase
    I homologue.

D (parallel to A).
    $i: enx \times a:1,5 \rightarrow B:a:enx. SW_975$
    $(\text{of 925})$
    $\text{PA 40 (nominal phase 2) may be mixed.}$
    \text{Needed phase 2:}

For: $(-1,2) \rightarrow a: enx. 3/7: \text{no consistent spread in any}
\text{exp or control. Activity of PA? 3/10}
\text{Glates. spreading dense}


G - MMC -

H -

SW_973 (3 cultures)

M: 1,2: $\rightarrow a:1,5 \rightarrow 1,2:1,5$

\[ \text{2 serum} \rightarrow [\overset{5}{\text{slide}}] \]

$\text{M1 mi 1,2,3 serum gave inhibition from restricted growth. 3/7: no serum.}$

$\text{S: i all passed through}$

$\text{M: i eventually passed through}$

\[ \overset{5}{\text{slide}} \]

Control gave 1 no change

$\overset{5}{\text{slide}}$

maybe 1, 10 or 1, 11?

Maybe cultures again

made i 5 as did older broth.
SW 957 eventually gave spread through tube; 891 and 960 remained immobile. Magg. 0, 1, 2. PR + helical + Magg. but through 5.

3/1 5H, 1, 2 react (weakly) in 2. Plant single colonies in

3/2.

Inhibition bubble, 2. Subary. spread = 5.

This would suggest

d = 20 (phase not necessarily) → x:1,2 → d:1,2

Test 5, 1 in 1, 2 SS. → 0. L are d:1,2

→ single colonies: 5: 

L: 

SW 960:

R tubes

J: __ 1:2000 5:1:1000

L: ++ ++

960 ++

957 ++

K finally gave out in 2. Serum: unagglutinable.

Select in SS: → Magg. (?) Kittel test. same K' (Magg.).

J = SW 974

K' = SW 977 (v. wh. maximum after passage twice in SS = d?)

L' = SW 960

B phase 891 957 960 → 1031. Hold off further work until

Very dark is understood.
1023 F&H report

3/19: F -
(6H small buds / not progressive)
(56,57 = abmy)

G: 333:
maybe 22°. Test single doxyc +
verify 233: eu
Test run with:  SD76 12 +
SW5V6 - ++

A.  
- 938 elt 0701-1 ++
- SW959 H1601.2 ++
- SW893 ++
- SW730 -
- SW1174 ++
- J.Taylor 1233.92 ++

B.  
- Arg 9DH + 8911-57 +
- Arg 791 732-19 ++
- Arg 710-52 ++
- Arg 710-52 ++
- Arg 9DH +
- Arg 9DH +

C.  
- S 1185.95 ++
- S 1185.92 +
- S 1180.90 ++
- S 1180.90 ++
- 4a : 5 mg

Note: 1.5 : ++ 36 : ++ after restting

Note: isolate 2 phases of agglutinability for 2 weeks.

Note: passage from rabbit 4 con x
aggl. in colon + ca 2-3 in.

Note: colonies through 15 days

daily butt with 4a, first to rotator for present purpose.
Test type parallelograms for phase purity.

Battleship from studies.

a) slide aggl.

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S. budvum strains from Edwards (Mar. - XXVII)

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4102 - proved tolerant to D: a !

culture is recorded as long live

--- Tube agglutination ---

b: 1/2

+++ =

--- Of previous page: the

b: ++

--- Mac b semen to

--- isolate 1, 2 phases on

--- subsequent transmission

to b: cex ; no agglutination -

--- Sheare morphosis:
3/1/53

(Bought harkle 2/15 + 1/53)

SW901 = S. choleraesuis kurjandorf, recently studied, 1/45-52, purified and 
mobilized. = −1:5, (c)?,...

SW958 = SW901 selected at 4W / immortelle semen. = c, c' = 75 C = 158 / kurjandorf semen. = c = -

Non-motile: 1520 - 1526-51 (see SW532-553) presumably all
non-motile deduced from putative virodetector. See letter to M. Yocham 7/2/53.
This SW should not be found. Other Vn not included in accesseses. Relationships of
3010-49 & 3012-49 not questioned.

Kerfmann's DM: recommended as highly aberrant

= whole 2.24?

Monophasics: −1, 2

Storks 191: lepton, ? listed as typhimurium.

SW960 = 5594-51 (Kerfmann) listed in buletis. Phage typing as page 15 but
is −1, 2.

(Best list in table?)

SW 959 = Hauriou VA H? No list but listed as −1, 2

3550-51: 2 cultures found, mehod monophasic 1, 2 and 2 rep.

Woolfin's name: 3550-51 as 0, 3551-51 as 0.142. 3550-51
is probably a fairly stable 6 that latum did give a 1, 2 phase. This should be verified.

SW 891, acc. to PRE letter, is −1, 2, 3 (Thiel-Cornell) + T91.
3/4/53 914/1A = SW 937/6 → \( z_{33} \rightarrow + \).  

See 979-9 and K.  914, K15-16 kept as magnifiers.

Now tested as possible \( z_{33} \) variants. → noted \( z_{33} \)

After mating 2 variants:

1. 14 enx; i
2. K15 enx
3. K16 enx

(through \( z_{33} \)) → through env:

\( z_{33} \)

\( z_{33} \) env.

K16 = \( z_{33} \) enx. 3 typical variants: SW 981

K15 also wants \( z_{33} \); 1, 2 at 1:500 / 1:1000!

but story repeats again: maybe rough. T. O.

Note 1023. SW 676 -x. Failed. Repeat 3/15.

PA 49-x SW 666

16 slow buds only. Eventually grown. At 1500/1500.

\( z_{33} \) LT-2

no mot. at all. T. O 10/21

SW 1005 selected from SW 705/6 +12 in tube (1/3 after motility solution of ph1). The ph2 appears

\( z_{33} \) env. (335 vs. env. Motility?)

\( z_{33} \) env.