Tests on 276 crosses

1. Bacteriophage resistance segregation.

<table>
<thead>
<tr>
<th>Plate 5</th>
<th>T-1</th>
<th>T(0)</th>
<th>T(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
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<td>+</td>
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<td>S</td>
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<tr>
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<td>+</td>
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</tbody>
</table>

- 4 B- out of 31 attempts. This is not a random segregation.
- 284-1 + 284-3 may be original mutants. See infra for determinations.

Scale out and test for broth.

<table>
<thead>
<tr>
<th>Plate 4</th>
<th>T-1</th>
<th>T(0)</th>
<th>T(B)</th>
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<tr>
<td>45</td>
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- Yeast? contamination.
### Biochemical reactypes

<table>
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<tr>
<th>Plate</th>
<th>Tube 0</th>
<th>Tube 1</th>
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<tbody>
<tr>
<td>T(B.)</td>
<td>T(Φ)</td>
<td>T(B,Φ)</td>
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<tr>
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</tr>
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</tr>
<tr>
<td>15</td>
<td>-</td>
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</tbody>
</table>

This is very suspicious. There should not be so many prototyes per original plating data.

### Notes

- **m BT.**
  - 21
- **ΦT.**
  - 22

32. Uplate 4 tubes

- 23
- 24
- 25
- 26
- 27
- 28

Isolates behaved similarly.

Φ is just shown, or T+T- very weakly in this strain. Exploit it.
Filter Y41 culture in YB (from 283).  Dil ca 1:3 E YB.  CO.

1.  Disp 1 ml YB 58-161.  
   30°C 1 P 25.

2.  Disp YB E 1 ml 58-161; 1 ml Y41 (culture above).
   Plate 1 P 27.  CO 2 50.

Disp YB E Y41 0 25.  Filter 1 P 27 ses above 1.
   30°C 58 1(1) 1 7

Plate in T(0) 7 P 28.

0.
7/26/46.
YP medium 1ml each. 86.30° P26 - N28 Plate in T(0).

3. Y10 + y14
   10.

4. Y11 + Y24
   300

5. Y11 + 161
   100

6. Y11 + Y43 o. (K-12 x B/1)

48 hours. But not quite optimal numbers.
July 28, 1946

BP28. Mix 2 drop of mixture. 8h. 30°

1. Y24 + Y41 T(Ba)  + 1
2. YB YB  + Y  6
3. Y24 + Y10 T(Ba)  + 4  0
4. YB YB  + Y  150 <

BM+TL5: Y40 + 679-680 YB  + Y  33
6. Y40 + Y45 YB  + Y  0
7. 58-183 X + YB  + Y  30
8. 679-680 (top)  - mL  mT  0
   2.680

Plate 0.1 ml = 1-7 into T(0). 8 into O, L, T.
Same with suspensions.

YB is OK but not entirely consistent. Compare culture to another.
E.G. Y40 + Y45 should be repeated.

Struck out 679-680 and use thereafter as Y47.
7/28/46

Test Y9m:

N
V
M
W

- +
++ --
++ --
++ --
++ --

Nethionine may be much stimulatory in wild type.

Evidently nethionine + some vitamin may be needed. (chlorine?)

Try series 2 vit. left out.

TLH + Vits. 12h.

1. B1
2. B2
3. ph 
4. nicot
5. folic
6. B6
7. niacin
8. pant
9. mos
10. biot

11. +V+yha
12. TLH+yha

Y44:

8  3 28

H + 1000 ml.

24h  36h

++
++

+10°C
++
8 P.M. 7/28/46.

Plate 1 incl. 287-4 into

<table>
<thead>
<tr>
<th></th>
<th>O</th>
<th>30, 25, 26</th>
<th>Average: 27</th>
<th>3</th>
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<tr>
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<td></td>
<td>30</td>
<td>3</td>
<td>1</td>
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<td></td>
<td></td>
<td>38, 35</td>
<td></td>
<td>29</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>185, 150, 126</td>
<td></td>
<td>116</td>
<td>4.0</td>
<td>S</td>
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<tr>
<td></td>
<td>T</td>
<td>50, 52</td>
<td></td>
<td>51</td>
<td>24</td>
<td>1.0</td>
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Summary: one might think: T - included
          P - linked either to B, O, or C.
          B, O, C also linked to each other. Need other data.
          Analyze other lineages. Test for resistance.
          A T-10 + and chemical by q. of those ind.

P30

<table>
<thead>
<tr>
<th></th>
<th># test</th>
<th># resist</th>
<th>fraction</th>
<th>Cale 5/M constant</th>
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<td>0.00</td>
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<tr>
<td>6</td>
<td>T</td>
<td>26</td>
<td>8</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Check R. 2B -
Check S, V 8P - 2P +
Check S, R, V

5 T - S
4 T - R,
10 P' + 2P' S
1 T + R,
7/29/46.

M28 pour s0 ml coli ~ D3, D14. 5h. 30°.

Inoculate each 1, 5, 5 mins to u-v exposed tube.
More 1 ml into coli ~ 6h 30°. 1 ml into 3 plates. Cover.

A. D3
1 min 10^5
2 min 10^3
5 min 10

B. D14
1 min 10^5
2 min 10^3
5 min 10

Use D3 1 min, D14 2 min.

Pour detection plates in T (CN) at 10^-8 dilution 6 h 30.

D3 - 12 x 40 = ca. 500 colonies 1 small colony.
D14 - 12 x 9 = ca. 100 colonies 1 small colony.

Plates contain do not pick.
7/30/46.

Going over old records, select all available which tested + on minimal (agar plate) but which were picked from small colonies. Determine inheritance of this characteristic.

A. ST - series.

<table>
<thead>
<tr>
<th>No.</th>
<th>Culture</th>
<th>Results</th>
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<tbody>
<tr>
<td>1</td>
<td>172-1</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>172-25</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>172-15</td>
<td>+</td>
</tr>
<tr>
<td>4</td>
<td>172-32</td>
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<tr>
<td>5</td>
<td>6305</td>
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<td>8</td>
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<td>9</td>
<td>6319</td>
<td>+</td>
</tr>
<tr>
<td>10</td>
<td>58</td>
<td>+</td>
</tr>
</tbody>
</table>

11. 6320     +
12. 6329     +

Numerous colonies appeared 10 P1.

*Plated too heavily.

A. Series. 3 P1.

Anaerograph.
Y10/1 × Y24.
TLB, B0E

30 JUL 1956

1 degree. 45°, 30°, 7P 30.

Wash and plate: Cale. typewrite 222 B 20.9

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 | 046,47,64 | 52 | 23 BFT | 12 | 17 |
| 2 | 70,66 | 16 | 24 BBL | 13 | 33 |
| 3 | 49,61 | 3 | 25 BFB | 14 |    |
| 4 | 22+..31+ | 26 TCL | 11 |    |
| 5 | 28+32 = 60 | 8 | 27 TCL | 10 |    |
| 6 | 44+44 = 88 | 36 | 28 TCB | 13 |    |
| 7 | 99+70 | 112 | 29 BTL | 73 [4,7] | 302 |
|* 8 | BFB | 4 | 30 TTB | 39 | 52 |
| 9 | TCB | 0 | 31 BBL | 41 |    |
| 10 | 6 | 0 | 32 BCT | 5 |    |
| 11 | 12 | 0 | 33 TCL | 5 |    |
| 12 | BCB | 19 | 34 TCB | 14 |    |
| 13 | CTC | 5 | 35 TCB | 15 S | 15 8 |
| 14 | FFB | 3 | 36 TCB | 20 |    |
| 15 | FLL | 10 | 37 TCB | 43 |    |
| 16 | BCB | 23 | 104 | 38 TLL | 39 |
| 17 | CTC | 11 | 0 | 39 TCB | 30 |    |
| 18 | 10 | 0 | 40 BFT | 56 |    |
| 19 | 8 | 0 | 41 BFB | 28 |    |
| 20 | TL 35 | 196 | 42 BFB | 53 |    |
| 21 | TBC | 22 | 43 TCL | 24 |    |
| 22 | LBC | 46 | 44 TCL | 23 |    |
| 350 |    |    |    |    |    |

*prép.  
*pl.  
*ph.  

Use in 1-7 net elevation.
August 1, 1946

Inoculate 36 hr. culture of 67S<sup>+</sup>-680 u.v. resistant tube, 2 ml. into test (YB) 1.9 ml. into coli.<br>
No. 2. Detection plates.

Pick 8 colonies:

<table>
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<tr>
<th></th>
<th>H</th>
<th>L</th>
<th>V</th>
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<tr>
<td>8</td>
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</table>
August 1, 1946
Received possibly contain, A 31 ε titre ca. 10⁹.

Inoc 1 ml ca. + 1 ml K-12 culture into YB plates. 30°C 50 P31-

Centrifuge off cells + sterile filter.
Plaque out T7 + T3 on K-12 and on B12 lawn. 1×10⁻⁴, 1×10⁻⁷.

A1. T-3, T-7 clear; others turbid (secondary growth?)
Filter T-3, T-7.
Repeat with others. n.g.

Plate T3, T7 geobre + mutants for resistance.

T3 Y40 5° do many resist. T7. Not mixed well; no lysis?
Y41 good lysis minute of plate 16 / 10.
N. C.

Culture phages ε B L. A2. + K12 no lysis.

3/16:
Filter, T2 3 T 2 3 +
Filter, T 7 6 +

High titer developed, turbidity cannot be lost after filtration of T2 which leaves no resistant. T6 could not be developed. Titers of other phages not consistent.

Redevelop T7 or K-12.
Tests on 240 - Varis R-dialage
See 290, August 1, 1946.

A. From 290-2 (in B) Test 5 R.

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B. From 290-5 (or P) Test 20 S.

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C. From 290-6 (on T) Test 10.

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<td>S</td>
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Check:

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</table>

p⁺ S 4 10
p⁺ R 1
1. Phage resistance from 0 plates. T-1. 25/35 susc.

2. do. B plates. 6/20

3. do. L plates 6/10

4. do. B1 plates

5. Bφ [Exp. 1:20] 2+ 1 B-

6. Bφ ϕ [Exp. 2:3] 2+ 1 B-

7. T-1 or TL, T10, LB.

8. T-1 or TL, T10, LB.

9. Bφ L [Exp. 1:3] 4+ 3 T-


11. Bφ T, [Exp. 1:6] 3+ 4 T-

12. φ TL [Exp. 1:3] 4 T- L- 2 T- 1 L-
Tage analysen: 297.

Recheck Biochemical reg.

{297 - 6, 11.}
Spread ca. 10⁶ bacteria on surface coli 20 plates.
Incubate 0-170 secs. under lamp. @ 17 cm.
Check in and look for spreader.

0.00
0.00
0/100
0/100
0.00
Sprayed after 36 hr. incubation.

0:00 5:00 10:00 15:00 20:00

Plates remained contaminated.
Repeat: 2 P. 9.
Comm. 200 plates for dup colonies. Use 3% agar base. 58-161.

Use complete cultures 10⁻⁴ 1 ml.

1. 10⁻⁶ 1 ml 75.
Residual remaining vol.: 0

2. 10⁻⁴ 1 ml +++ (compatible < 7500)

3. 1 sec. ++

4. 2 sec. ++

5. 5 sec. ca 200.

6. 10 sec. ca 10. (some may have been shielded by edge of plate).

6 sec. is diff. to control. Use 40 secs. and a higher conc. back.

\[(0.02)^{-} = .0007\]
August 8, 1946.

Quadrats 1.5 mins. in quarter tube.
P 0.1% DMSO 5 ml into 50 ml coli. 50. 1198.
detection plates 2A11. in T (cyst, nic).
Pack 12 03 , 10014.

all grow in $P(0) = [T + nic + cyst]$
8 AUG 1993

P8 mox. YB.
599 plate into 0, etc. 0.5 ml

\[ \frac{y_{24} 	imes 10}{1} \times \frac{y_{12.71}}{1} \times y_{10.7} \]

A

<table>
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<tr>
<th>26</th>
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<th>28</th>
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<tbody>
<tr>
<td>C</td>
<td>C</td>
<td>28</td>
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</table>
| C  | 26 | 10 | 29 | R1 = 0.34

B

<table>
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<tr>
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C

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</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>T</td>
</tr>
</tbody>
</table>

Sample colonies (left for sex types).
August 10, 1946.

P10. inoc 50 ml col 0 + 675-800 th. 30°.

P11 Wash & inoc 5 ml into T(0) + NEAA + Vits + EAA -

Plate 1 ml into T(0), T(1c) T(8h). a) leucine

b) threonine.

Plates: L. 22
T. 4
0. 0
August 15, 1946.

Dr. JVB P12 Plate M14. Sec each.

1. Y x Y
2. Y x 101
3. 101 x 101

301-1-3

1. B φ T
2. B φ L
3. C B
4. φ
5. φ TL
6. B TL
7. B B
8. B φ T
9. B B L
10. B B T
11. B φ T
12. φ L
13. φ B L
14. φ T
15. φ L

301-4,5

301-1-5

Collect B φ and test for B. 

Collect + and examine for heterogeneity. Select a + which appears to be true.

Summary:

<table>
<thead>
<tr>
<th>B</th>
<th>φ</th>
<th>T</th>
<th>L</th>
<th>B</th>
<th>φ</th>
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<td>86</td>
<td>36</td>
<td>3.2</td>
<td>4</td>
<td>5</td>
<td>1</td>
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</table>

Mean plates counted:

146 | 37 | 31 | 55 | 56 | 52 | 19 | 16 | 28 | 41
Strains:

K-12  L15  6522  B1/2  Proteus
58  679  148-324  Y1  B11  (O, I, enes)
58-161  679-680  332-171  Y2  B  B3
58-278*  679-680A  209-301  Y3  T  D14
58-309  679-185  732-171  Y4
58-336  679-740  538-228  Y5
58-580*  679-662*  572-228
58-593*  679-680  1230-228
58-610  679-680-79  825-304
58-741  679-680-710
58-2451
3214
3232
3256
4899*
5230
5255
5273
5298
5411*4
5450
5580
5631
5636*
58
6049
6177
Y17
Y17-
Y15
Y16

* 66-489  lys.
* 151-171  lys.
* 18-151-171-meth.

Shigella paradysenteriae
Aerobacteriaceae: enterics
Enterobacter aerobius
Entobacter vibrio
Pseudomonas mendocina (Wicherau)
P. mendocina (Spiegelman)

Allergens: E. colii. Yale 4635, pestil.

Yeast:  S. cerevisiae. Yale 307212. pestil.
Sericillus.

15 Aug.
I. 2 drops Y40 into 5 ml YB config: 2P/1 30°
2. 50 u/ml – 1P/5, N16 – filament, "zygoporus" common.
3. 100 - moderately inhibited.
4. 150 - strongly inhibited.
5. 200 - " penicillin."

Repeat:

1P21.
1. Penicillin 2500 u./50 ml + 1 ml water Y10/1. 5h 30°
2. 4P22. Filamentous + circular rods. V. rare "zygoporus.

4P21. 2 drops 1 ml Y10/1 into YB 50 ml 5h 30°
Salmonella stocks.

August 20, 1946.
Received from P+S diagnostic labs. to persistents 

24 hr. readings:

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<th>R</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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24 hr. readings:

<table>
<thead>
<tr>
<th>R</th>
<th>9a</th>
<th>9b</th>
<th>9c</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>10</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

para A: methionine, tryptophane
cholerae: methionine
leuconarin: - any unknown.

5 pullorum stocks - see infra. as above analysis
Crosstracks Salmonella pullorum, and SISH 2 T1, T3, ...
10PM. 8/24/46.

30°C. 1% B. 1 ml more.

1. Y24/1 x Y10
2. Y24/1 x Y10/1
3. Y24/1 x 679-680
4. Y24 x Y10

Plate 5 P28 (1/2 ml) ex colonies P30.

5 ϕ TL, B, very crowded.
6 ϕ LB, very crowded.
7 ϕ TL, B, very crowded.
8 ϕ TL, turbid.
10 ϕ EE, turbid.
11 ϕ CTB, too turbid.
12 ϕ CTL, too turbid.
13 ϕ ELB, too in E.

System contains too much B, B. 30°C evidently.
data:

Plates: Colony types:

BφTB, 15 + 6 φ 5 B, 2BφR 1B, 1B?

10 φ LB, none taken

BφTL 20 + 4 φ 1 BφR 1? 1φ2 1BφT φL?

BφTB, 5 + 3 B, (1B,φ) 1B, 10, 1 L: macrotype.

+27/37 R, 8'9 R B, 10/10 R φ

imixld (304-1) see 305

40 + 1 B, 1 φ?

10 φ 3 BφR

9 B, 1 B, T

(8B,R,1B,1)

304-1: attached + yeast:

10/10 S!!

φL: app. OK incub. but, detail. same growth as φ alone!
P30. streak out and test colonies for T1 resistance.

1/15 resistant ① → 20/20 R.  
10.  ① → 1/10 R.  (str. crit.)  
6.  streak out ① + ②

Test with reg. of several types.

1. ①  ++
2. ②  ++
3. ①  ++
4. ①  ++
5. ①  ++
6. ①  ++

2: resistance component of ①  (Beta 1 - slow on -C? )  ++

a: test ① and ② colonies for resistance:

Compare 301-1.

26: all resistant.

∴ 301-7 is evidently a mixture of R + S, 1/10 colonies from which was also contaminated.
10 SEP 1946

Salmonella pullorum
lcr cinchococcum

48 hour 512x YB. Broth 1:100-1000
1. T(0) 
2. T(6)

more colonies
not turbid!

Later showed mild cystine
September 4, 1946, AF.
The 6 & combinations of B, B1, T, L are available.

Strainout on NSA plates and inoculate colonies into 50 ml YB to CC slants for inocula to confirm growth factor requirements. Incubate with excess T1, T3 in NSA plates for virus resistant mutants.

<table>
<thead>
<tr>
<th>Source</th>
<th>Mut. No.</th>
<th>Virus</th>
<th>Revert?</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;TL&quot;</td>
<td>679-680</td>
<td>Y30</td>
<td></td>
</tr>
<tr>
<td>&quot;TB1&quot;</td>
<td>304. H.+</td>
<td>T-</td>
<td>R1, S3</td>
</tr>
<tr>
<td>&quot;BL&quot;</td>
<td>300-1</td>
<td>1</td>
<td>R1, S3</td>
</tr>
<tr>
<td>&quot;BT&quot;</td>
<td>285-24</td>
<td>1</td>
<td>S1, S3</td>
</tr>
<tr>
<td>&quot;BB1&quot;</td>
<td>301-2</td>
<td>1</td>
<td>S1, S3</td>
</tr>
<tr>
<td>Rev.&quot;LB1&quot;</td>
<td>445</td>
<td></td>
<td>S1, S3</td>
</tr>
</tbody>
</table>

Use revert Y number.

BB1
- 11 R
- 13 M
BB
- 11 R
- 13 M
LBT
- 11 R
- 13 R

Yield: 11, R, 13 M
8 Sep 1943

Recal. from Raphaël Langem:

\[ a \quad 15L-171 \quad \text{lys} \]
\[ b \quad 18-15L-171 \quad \text{meth} \]
\[ c \quad 66-489 \quad \text{lys} \]

According to Brownjohn, \( a : 5 \) single colony subtilin

\( b : 1 \) colony away from \( a \).

Test \( a \) and \( b \) on:

<table>
<thead>
<tr>
<th>Lys</th>
<th>Meth</th>
<th>Lys Meth</th>
</tr>
</thead>
<tbody>
<tr>
<td>A8</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>A10</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>B</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>C</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>+</td>
<td>+++</td>
</tr>
</tbody>
</table>
8 SEP 1946

Instrual 36 cm. Y10 into colonies (48h.)

1. C
2. B
3. T
4. L
5. B, T
6. B, L
7. T, L

no survivors! (readability?)