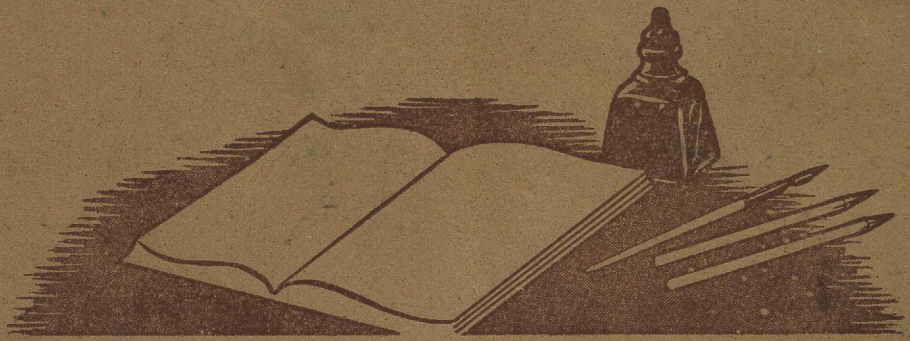
RULED FEINT



EXERCISE BOOK

3.25
2.30

NAME Dr. K. Bahadur

SCHOOL

RE-ORDER No. 1

BRITISH MADE

(13)

(16) (13) → (A) garden soil, ref. 3. 3rd. INO., 5th May. 30°C. azoto. medium,

(13) (14) (14) → Ref. 3, 3rd. INO. 5th May. 30°C. azotobacter medium. (13, 14, fast. grow)

(14) (15) → ~~Ref. 3. 3rd INO 5th May 30°C azotobac medi.~~

(15) (16) → ... Ref. 2, 3rd INO, 5th May, 30°C. Azo. medi.

(15) (16) ~~... Ref. 2, 3rd INO. 5th May 30°C. Azo. medi.~~

(17) ... City soil - 3rd. INO., 5th May, 30°C.

(18) ... Ref. 5, garden soil A, 3rd. INO 5th May, 25°C, Azo. medi.

(19) ... Ref. 5, garden soil A. 3rd. INO, 5th May, 25°C Azo. Medi.

(20) ... ~~Az~~ Ref. 12, B garden soil, 3rd. INO. 5th May. Azo. medi. 25°C.

(21) ... Ref. 1, garden soil, 3rd INO. 5th May, 36°C. Azo. bact. medi.

~~(22) ... Ref.~~

(22) - Ref. 21, Reseeded 9th May, 36°C, Azo. lac. garden soil.

(23). - Ref. 21, Reseeded 9th May, 36°, Azo. lac, garden soil.

(24) Ref. 13, INO, 9th May, 30°C. Azo. bact,

(25) Ref. 14, INO, 9th May, 30°C. Azo. bact.

(26) Reff. 15, INO, 9th May, 30°C. Azo. lac ← Clear brown ring appears after eight days — slight pigment formed

(27) Ref. 15. INO. 9th May 30°C. Azo. lac.

(28) Ref. 17, INO. 9th May 25°, Azo. lac.

(29) Ref. 18. INO. 9th May 25° Azo. lac.

(30) Ref. 20th INO. 9th May 25° Azo. lac.

(31) Ref. 20th INO. 9th May. 25° Azo. bact.

>

~~ap~~ 11th May. 50

22 + 23 two types are 23 gives a distinct ring after 2 days. Other one does not.

24, 24, 25, - (27) fast (26) - 30° = 7

-25° = 4

(32) — Oak litter. 1st INO, Azo b. med. 12th May '60. 30°C.

(33) — Incubated for the 1st culture of flat soil — (A. 27/4), 13th May '60. ~~Room~~ at all temp.

(34) — ———————— (B 27/4), 13th May '60. All Temp.

(35) — City garden soil — 3rd INO. on 13th May. Room Temp.

(36) — Ref. 22. INO. 13th May, 36°C. Azo. lact. medium.

(37). Ref. 22. INO. 13th May, 36°C. Azo. lact. medi.

(38) Ref. 23. INO. 13th May, 36°C, Azo. lact. medi.

(39) Ref. 24. INO. 13th May, 30°C. Azo. lact. medi.

(40) Ref. 25. INO. 13th May 30°C. " " "

(41) Ref. 26. INO. 13th May 30°C. " "

(42) Ref. 27A. INO. 13th May 30°C. " "

(43) Ref. 27B. INO. 13th May 30°C. " "

(44) Ref. 28, INO, 13th May '25°C. " " ".

(45) Ref. 29A, INO, 13th May 25°C " "

(46) Ref. 29B, INO, 13th May 25°C " "

(47) Ref. 30 A. INO. 13th May. 25°C — " " — Slow growth.

(48) Ref. 30 B. INO, 13th May, 25°C " " Fast growing.

(49) Ref. 31 A INO. 13th May, 25°C, " " Fast growing. Distinct only on 16th.

~~49~~ (50) Ref. 31B, INO. 13th May '25°C " "

(51) — Ref. 22, 36°C, 16th May, Mineral free (mf). azotobacter medium)

(52) Ref. 23, 36°C. 16th May, Mineral free azotobacter.

(53) Ref. 26, A, 30°C, INO 16th May, mf azo.

(54) Ref. 26. B, 30°, INO. 16th May. mf azo.

(55) Ref. 26. C, 30°C. INO. 16th May. mf azo.

(56) Ref. 24. A, 30°C. INO. 16th May mf azo. No yellow pigment sol. in water. D. brown pigment. 24/5 less gas.

(57) Ref. 24. B. 30°C. INO. 16th May mf azo. — Grows well, on without Ca, forms a yellow water soluble pigment. & Dark yellow or brown pigment. non growth. 24/5.

(58) Ref. 27A. 30°C, INO. 16th May mf azo.

(59) Ref. 27B, 30°C. INO. 16th May mf azo.

(60) Ref. 25A. 30°C, INO. 16th May mf azo.

(61) Ref 25 B, 30°C. INO. 16th May mf azo. 1the part shows a little evolution of gas.

(62) Ref. 25C, 30°C. INO. 16th May, mf azo. — The part 25 C [illegible] indicates Humus, much growth

(63) Ref. 12, A, 25°C, INO, 16th May, mf azo.

(64) Ref. 12B, 25°C. INO. 16th May mf azo.

(65) Ref. 12C. 25°C. INO. 16th May mf azo.

} very strong black pigment after 20 days. starts 13th day. 12, 20, 31b, 50.

(66) Ref. 30 A, 25°C, INO. 16th May, mf azo.

(67) Ref. 17A, INO. 16th May, mf azo. 25°C.

13, 24, 39, 56, 57, 80, 90, 100, 101

14, 25, 40, 60, 61, 62, 78, 104, 105, 84.

2, 15, 26, 41, 87, 53, 54, 81, 83, 95, 79, 55,

27, 42, 43, 58, 59, 86, 102, 103,

68 — Ref. 30A, IND. 18th May, 25°C, ago. ~~20C~~.

69 — Ref. 28A, IND, 18th May, 25°C ago.

70 — Ref. 31A, IND, 18th May, 25° ago.

71 — Ref. 31A, IND, 18th May, 25° ago.

to be examined.
72 — Ref. 45A, IND, 18th May, 25° ago

73 — Ref. 48A, IND, 18th May, 25°C ago.

74 — Ref. 50A, 18th May, 25°, ago.

75 — Ref. 49A, 18th May, 25°, ago.

76 — Ref. 46A, 18th May, 25°C ago

77 — Ref. 29, 18th May, 25°C ago

78 — Ref. 25A 18th May, 36°C. ago.

79 — Ref. 26C, 18th May, 36°C ago.

Exam. 80 — Ref. 13, 18th May, 36°C. ago. — Fast going 20/5. Growth stopped after an [illegible] 21/5

(81) — Ref. 26A, 18th May 36°C ago — effervescence on 23rd May.

~~Exam.~~ (82) — Ref. ~~30~~ 36A., 30°C, ago, 18th May — moderate growth (effervescence with evolution of gas)

83 Ref. 26.B, 30°C ago, 18th May. — Scum formation.

84 Ref. 14, 30°C, ago, 18th May — Fast going

85 — Ref. 38A, 30°C, 18th May, ago. — Fair growth.

Exam. 86 — Ref. 27A, 30°C, 18th May, ago — slow growth with effervescence

87 — Ref. 41A 30°C, 18th May ago. — Slow growth. Lots of foam at surface 24/5.

85, 84, 83 appear to be interesting. 20/6/60.

88 – Ref. 37A, 30°C. 18th May ago.
89 – Ref. 51B, 30°C. 18th May ago.
90 – Ref. 39A, 30°C 18 May ago.
91 – Ref. 35. A., Room temp, 19th May mf ago.
92 – Ref. 22. 36°C, 20th May, mf ago. No gr th. 23/5
93 – Ref. 23, 36°C., 20th May, mf ago. – No gr th. 23/5
94 – Ref. 37A, 30°C. 20th May mf ago. = =
95 – Ref. 83, 30°C. 20th May mf ago. – Some filamentous colony,
96. Ref. 84A, 30°C. 20th May ago.
97. Ref. 84A, 30°C. 20th May mf ago.
98 – Ref. 85, 30°C. 20th May. mf ago.
99 – Ref. 85, 30°C, 20th May ago.
100 – Ref. 56, 30°, 20th May mf ago.
101 – Ref. 56, 30°C. 20th May ago.
102 – Ref. 59, 30°C. 20th May mf ago.
103 – Ref. 59, 30°C. 20th May ago.
104 – Ref. 60, 30°C. 20th May mf ago.
105 – Ref. 60, 30°C 20th May ago.

23/5/60. Culti 36°C — 80, 81,
30°C — 56⁻, 60, 57⁺, 62, 64⁻,
95, 87, 83, 103, 27A

106 — Ref. 66A, 20 mg, 25°C, mf. azo. (Ca+Mg free)

107 — Ref 66A, 20 mg, 25°c, mf azo.

108 Ref. 66A, 20 mg, 25°c, ~~mf azo~~ azo.

109 — Ref. 67A, 20 mg, 25°c, mf azo. (Ca+Mg free)

110 — Ref 67A. 20 mg 25°c. mf azo.

111 — Ref. 67A, 20 mg 25°c, azo.

112 — Ref. 50A, 20 mg 25°c. mf azo.

113 — Ref. 76A, 20 mg, 25°c. azo.

114 — Ref. 77A., 20 mg 25°c azo.

115, Ref. 73A, 20 mg 25°c, azo.

Final selection:

36° — 80, 81°

30° — 85, 82, 84A. 57, 52, 83,

25, 109, 107, 48, 74.

Q 8

116/74 — Ref. 74, 24/5 mg, 25°c. azo.
examined fresh pure.

117/107 — Ref. 107. 25/5 mg, 25°c. azo

118/73 Ref. 73. INo. 25 mg, 25°c. azo.

119/109 Ref. 109. INO. 25 mg. 25°c. azo.

120/59 , Ref 59, 1No. 26 May, 30°c. ago.

121/62 , Ref. 62, 1No. 26. May 30°c. ago.

122./83A Ref. 83A, 1No. 27, May 30°C ago.

~~83/A~~ 123/82A Ref. 82A. 1No. 27, May 30°C ago.

124/84A - Ref 84A. 1No. 27 May 30°C. ago

125/85A Ref 85A 1No 27 May 30°C. ago.

126/81A Ref 81A. 1No. 27 May 36°c ago.

127/80A Ref. 80A. 1No. 27 May 36°c. ago

128 - Ref. B. 27/4 , 1No. 1/Jun '60. ago.

129. Ref. 128. 1No 8/6, ago.

130 - Ref. 123/2. after the ~~dd~~ P.T. picked up to 130/1, 130/2

131 — Ref. 121/1. after P.T. picked up two. 131/1, 131/2

7/6

93 — $\frac{93}{1}$, $\frac{93}{2}$, $\frac{93}{3}$ on 7th Jun.

126 " $\frac{126}{1}$, $\frac{126}{2}$, $\frac{126}{3}$ "

127 A Ref. $\frac{123}{2}$, ~~separated from~~ a petty Disc.

128 →

27/6 W.O. Ref. Norris-1's Az. Vinelandii, (W.O.)

L.H.1.-0 Az. macrotogenes. (L.H.1.-0)

222 - Az. Chroococcum (Chm)

V5 - Az. agilis (A.K.)

5½ 74

(107.) 

6. Pure. non motile, in clusters three or four. either there are two types of organism the one seen distinctly and its shape is  .

9 73 – Culture has spherical cells. seen  mostly in groups of more than two.

7½ ✓ The colony is smeared in a mucilagenous mass.

✓ 109 – Pure cells very big and held together with
7½ a mass of mucilagenous matter.

30°C.

3, 59 – Infected with small point and rod shaped bacteria. Cellcolonies are round with a few very big cells.

6½ ✓ 84A. – All the bacillus are rod shape. It appears that these curl and take up a round shape and appear as above big cells. Smaller in size.

7½ ✓ 63 – Rod shaped, from large colony which are not oval but in lumps. Resp

3 83A. – Rod shaped, yeast like and dot shaped three colonies –

2½ 84A Mic – 11.

✓ (85A) — Peculiar spherical moving organism.
$5\frac{1}{2}$.

81 — No good.
80 — Impure —
✓ (92) — Sherical, mobile, pure, some ~ Shape.
Then became spherical and ... with shining mucin and then died.
93 — Clear Rod shaped, pure, cells, a few (very few dot shaped)

87 — Long rod shaped, form big clusters, and gives 30°C
a lot of effervescence. No formation of black pigment. 30°C
8/10 (103) — Yeast like, very pure.
$6\frac{1}{2}$ — 26B — Spherical mobile, colony like yeast. 30°C
56 — . { : then three types pure. 30°C.

Sunny cupps 31st May 36° — 73 & 109
30° — 84 A, 63, 103, 87,

61- Infected

(95) — yeast cell like, some big but coil after sometime. It has to be seen whether these are the same bacteria.

25°C (87) Infected.

8½ 75 • small spherical, brown fast moving, dark in colour fairly pure 25°C.

(20) Infected.

50A — Thick growth of a few types - yeast and big endospore det. dark.

Incub.: 7/6°

123/2 Is the fastest growing organism. } 30°C.

120/2 Is fast grow.

93/1 Is fast grow - 35°C.

111/2, 66/2, 109/1, 75/1, 75/2 are fast grow of 25°C.

10th Jun '60.

30°C 123/2. The organism is spherical, motile and distinct protoplasmic round nucleus is observed. There is almost all size of spheres seen and either the smallest one is one variety of bacteria and the largest one is another type or these are

representative of the different stages of growth of a same organism.

121/1 — Long rod shaped, sometimes a few of them join together to form a mycelium type structure. Non-motile. However a few brown granular non motile st. is also seen. Other than this two ∞ and δ st. are also seen.

121/1A - No. organism was seen.

128/2 — Infected.

12th Jan 25°C.

66/2 — Infected.

30°C (75/2) quite pure. rod shaped, motile, mucin forming, There is some spherical very cells so a P.T. needed.

30°C — (11/2), 111/3, 109/2 — 25°C

123/2, — 30°C

36, 127°C/2

✓ 111/2 One big variety of cells which are big rod shaped but form a thick mucilaginous coating. Another small rod shaped orgo. Only two varieties (Pure)

✓ 111/3 — Pure big enlarged mucin - big thin organs. - dimensions seen.

✓ 109/2 — Medium size - mucin, yeast like cells, Pure.

109/1 Useless →

(72/2) — It has small rod type cells which unite to form a colony. Motile, thin, small but a few larger orgo. Cells are

So it may be P.T.

120/2 – Mixed. fine rods. and long loops with a few swollen rods.

Room Temp. { 128/1 – Small dot like or may be small rod, dark in color, highly motile. Pure. no slime for colonials. color given to but ~~greffemmes~~. Thick gr.

128/2 – . Pure Same as above. Thick

14/6 Pure. 128/2. Black small spherical motile cells. Pure. Thin growth.

Pure. 128/3 Short rod shaped pure. ~~Thin growth~~

Pure. 129/4 Small round dot like, appear white in one angle and dark black in the other, motile, from colony and semi

Pure 128/5. ~~Dot like small~~ small rod like dark brown cells, fewer in number, from colony and in hedge member.

Pu. 128/6 Small dark brown rods. motile.

36°C

127/2. Small, oval, dark brown, motile move in one direction forms a slime (Very. Pure)

127/3 – Mixed cult –

93/2 Mixed.

30°C. $\frac{122}{1}$ - Mixed.

P.T. $\frac{10D}{1}$ — It contains a few very very long thread like bacteria. These may be isolated.

At 36° The test $\frac{127}{2}$:- round (oval) bacteria. motile,

At. Room temp.

motile. $\frac{128}{1}$, $\frac{128}{2}$, $\frac{128}{3}$, $\frac{128}{4}$, $\frac{128}{5}$, $\frac{128}{6}$.

At. 30°C - $\frac{123}{2}$ yellow.

At 25°C. $\frac{111}{2}$, $\frac{109}{2}$

15/6 $\frac{25°C.}{\frac{74}{2}}$ — Small rod shaped organisms but a few spherical motile strands also. Infected.

P.T. $\frac{74}{1D}$ Small rod shaped, thin, nonmotile organisms, mostly but a little infection of oval moving organisms and a few very long organisms.

Pure. $\frac{50}{1}$ Long thread like organisms, motile, divisions distinct, a few small rod shaped organisms are seen but these may be the young of the older organisms.

Pure. $\frac{50}{2}$ - Small rod shaped strain, nonmotile, a few organisms are small rod shaped and motile. These may be the young ones ?. No motile.

$\frac{107}{2}$ - Infected.

$\frac{73}{1}$ Infected,

P.T. $\frac{106}{1}$ small rod motile mostly but infected.

$\frac{66}{1}$ Pure small rod shaped, motile. from colony + Plate,

$\frac{66}{2}$ - Infected.

$\frac{66}{1}$ - Infected.

P.T. ~~$\frac{66}{66}$~~ $\frac{107}{1}$ - Mostly ~~a~~ short rod, motile but a few large moving objects.

P.T. $\frac{111}{1}$ - Big colony of oval or spherical cells, but fairly good rod shape st. and a few moving rod objects. It should be seeded on P.T. because it does not form spirit.

$\frac{93}{2}$ - Infected.

$\frac{127}{3}$ - Infected.

Conversion. Culli No. $\frac{50}{1}$, $\frac{50}{2}$, $\frac{66}{1}$. are pure 25°C, 30°C,

P.T. $\frac{100}{1}$ Mostly myl. long shaped organism but a few Clostridium. P.T. isolated.

Pure. $\frac{123}{1}$ - Small rod shaped motile, from colony, but a few myl long ms are present.

121/1A – Infected.

120/1B Infected.

Temp. 30°C.
123/1, 100/1

30°C. 16/6. 103/3 – very pure long rod shaped motile. ~~Appr~~ differently at diff age.

P.T. 103/1 – Hook shaped thin non-motile organism mostly but a few clostridium.

104/2. Infected.

104/1 Infected.

13/1 Infected.

13/3 Infected.

103/4 Infected.

100/2 Infected.

13/2 Impure.

P.T. 87/1 Mostly rod shaped motile. a few oval dark brown motile organism.

? 38/1 Long motile, motile dark brown in color and a few clostridium.

P.T. 103/2K Mostly long shaped motile organism, non-motile hook shaped and also a few clostridium.

P.T. $\frac{43}{2}$ – ~~B~~ Pure rod shaped medium bacillus, motile plus a fungus (brown in color) is observed.

P.T. $\frac{43}{1}$ Some unspecified organism. Pure.

24/Jan '60. – 30°C

~~28~~'

$\frac{103}{3}$, culture very pure. at 30°C.

$\frac{122}{2}$ – Round zigzag moving objects, perhaps with a tail, brown pigmented patches are seen. I have seen a few long bacillus.

Pure –

$\frac{121}{1}$ – Mixture of spherically moving and long rod shaped motile bacteria.

$\frac{120}{2}$/1 Spherical nonmotile cells. a few small brightly motile cells

Pure $\frac{103}{2}$/2 – Motile rods, brown to brick or blue.

$\frac{103}{1}$/1 – Could not see.

$\frac{120}{1}$/1 – mixed.

$\frac{120}{2}$/3 – Almost pure culture of clostridium but a few such st. are well isolated and motile. Rest nonmotile

$\frac{100}{1}$ Clostridia or long rods.

100/1 | 1 — Clostridia + long rod.

130/3 — Yellow culture, bottom local growth, network, a small point like object moving. It may be either a new organism or fungus + bacteria.

Rom Tempt. 128/10 — Mixture clostridium + small rods.

128/8. — Could not see.

25°C.

27/6. 50/1 | 1 — very pure small rod and motile. with wavy motion.

75/2 | 2 — Pure, rod seems vertical, less growth than the above.

50/2 | 1 — very pure, thick growth, motile rod.

66/1 | 1 — Pure, a bit larger in size and motile rods.

75/1 | 1 — Rod, motile, pure, yellow flower like pattern. as if a crystals are being formed. If these are bacterial st. it is one of the most extraordinary thing

75/2 | 1 — Pure rod [illegible] motile, There are a few round cell colonies [illegible]. If these are not inorganic salts these may be diff bacilli.

74/1 ✓ Mucin, pure, motile, rod.

28/6 66/1/2 ✓ Non motile very pure rod like. Good growth.

✓ 50/2/2 This motile rod pure, but very little growth.

✓ 75/2/3 A bit larger rods pure and motility seen only a in young age.

✗ 106/1 A mixture of rod motile and oval dark colored motile sl.

✓ 75/1/3 rod non motile Pure one type. Thick growth.

✓ 75/1/2 - Non motile rod, pure,

29/6 - 30/6 11/1 mixing rods and a very big oo bacteria. P.T. essential.

107/1 - Mixing spiral & rod shaped cells. As I do not have special cell culture there my be P.T.

29/6. At 25°C.

50/1/1, 50/2/1, 75/1/1, 75/2/1, 74/1, 66/1/2

75/2/3, 75/1/3, 66/1/1

18th May.

37A – Thick mucilagenous ring in 6 days.

37B – Ring is thin on 6th day

36A – The growth is granular

36B – Granular and very little.

56 – A little growth in myago.

53 – A little growth with bubble formation

49+50 61, 60, 62 is the order of growth in myago.

31A – Excess growth and black pigmentation in 9 days.

Final,

30°C. – 13, 43, 87, 100, 103, 104, 120, 121, 122, 123,

25°C –

25th June

Special attention should be paid to the following cultures

30°C. – 103. – It is a pure culture and fixes sufficient nitrogen.

$\frac{103}{3}$ It is very pure and its N fixation is to be tested.

$\frac{120}{2}$/3 Fast growing clostridium.

121 is N-fixing but is not pure,

120 – Small & long rods.

$\frac{122}{2}$ – Maximum fixation of N.

$\frac{123}{1}$ – Pure

$\frac{123}{2}$ – Pure.

So. 103, $\frac{103}{3}$, $\frac{120}{2}$/3, 121, 120, $\frac{122}{2}$, $\frac{123}{1}$, $\frac{123}{2}$

Are the cultures of our interest at 30°C.

122

$\frac{120}{2}$ Kept – but not pure.

This forms two colonies (i) triangular dark brown 1B. (ii) White shiny brown W.B. 3

gives me (i) white W. (ii) dark brown coloured B

gives two colonies (i) swollen & brown coloured S.B. (ii) Small dark P brown. D.S.B.

Forms star like colony. centre dark coloured.

Estimation of Nitrogen.

20/6. 30°C. - analysis in the order 87, 103, 120, 121, 122, 123.

87 — 10 c.c. culture medium digested and

$\frac{N}{50}$ H_2SO_4 - 0·7 > 0·3.
1·0 >

103 — 10 c.c.
$\frac{N}{50}$ - 2·35 > 0·7
3·05 >

120 — 3·16 > ·59
3·75 >

121 — 3·8 > 0·8.
4·6 >

122 — 4·675 > 1·075
5·750 >

123 — 5·80 > ·85
6·65 >

These were sealed on 2/6. Kept at 30°C and analysed on 20th June '60. The media was prepared in 50 c.c. conical pyrex flasks.

21st June. 25°C. The analysis of the cultures from 2nd June.

109 — 75, (low growth bottom)
111 — 66, medium growth, sediment at the bottom and very few
107 — 74 - low growth. bottom
50A — 106 - (fair growth) little at bottom and dispersed
low growth, sediment at the bottom, very little also,
Medium growth at the bottom, a very few
111 — medium growth, a little sediment, few white very, yellow
109 — medium growth, well dispersed bigger pieces at the bottom. medium

The culture media were put ~~[illegible]~~ in the boiling tubes.

The order is 50A, 66, 74, 75, 106, 107, 109, 111,

The old culture of the following have colour ring.

Brown — 106, 75, 107, 74, 66, of which the ring of 106 & 66 is very mild where as the rest form distinct brown ~~ring~~ pigment.

Yellow media — 111 — The top remains white

White top. 50A, 109, have white scum.

The age of these above tubes can be seen by the culture records. and the description has been written from the test tube culture.

50A — ·035 / ·835 > ·800. ✓

66 — [illegible] appears cm. & viscous. — ·925 / 1·800 > 0·875 ✓

74 → 1·90 / 2·35 > 0·45 ✓

75 → 2·425 / 2·525 > ·1

106 — No. ~~[illegible]~~ acid reqd.

107 — No acid required.

109 — 2·875 / 2·975 > 0·1

111 — 3·15 / 3·20 > ·05.

28th Jun '60

Tempr. ~~93~~ 36°C. Only no. 93, 126 & 127 were prepared.

There was not much growth in any of them.

Anyway I analyzed them.

started on 2/6.

(I) 93 — 2·5 / 2·625 > ·125

(II) 126 — 2·73 / 2·85 >

(III) 127 — 2·95 / 3·35 >

(IV) St. 29/5 One Lactose : — cond. slow 2/6 8·435 / 8·600 > ·235

V ·4 gm. of paraffin + colloidal molybdic acid (cold) → 3·45 / 5·95 > 2·5

VI Only ·4 gm of paraffin. — 6·0 / 8·325 > 2·325

Azotobacter Medium:

Mannitol	15 g.	$MgSO_4$	0·2
K_2HPO_4	1·6	NaCl	0·2
KH_2PO_4	0·4	$CaSO_4$	0·1
$CaSO_4$	0·1		
$FeSO_4 \cdot H_2O$	0·015		
~~Ka~~ $NaMO_4$	0·001		
agar	– 1 l		

'Anabaena Medium' used by Fogg for N-fixing algae,

K_2HPO_4	– 0·2 g	in one l of pyrex glass distilled water (essential)
$MgSO_4 \cdot 7H_2O$	– 0·2 g	
$CaCl_2$ anhyd.	– 0·1 g.	
NaCl	0·05 g.	

Trace elements

Fe	– 0·04 mg Fe/l	1·17 use $FeCl_3$ or Fe citrate or EDTA complex.
Mn	– 0·1 mg Mn/l	·38 use $MnCl_2$
Mo	– 0·1 mg Mo/l	1·63 Molybdic acid.
B	– 0·1 mg B/l	·6 boric acid
Cu	– 0·01 mg Cu/l	·04 $CuSO_4$,
Zn	– 0·01 mg Zn/l	·07 $ZnSO_4$.

0·8% of oxoid No. 3 agar,

G. Cone 7 Queens Gate Pl. KNI 9410

Mn — 54·93

Fe — 55·85

Mo 95·95

B. 10·82

Cu — 63·57

Zn — 65·38.

1·4 / ·4 } diss. 1000. (14) 1 c.c. ·2, ·4, ·8, 1·2, 3·2.

·05, 1·0, 1·5, 2·0, 2·5.

After eight days.

	III/3	III/2
Blue ~~Pink~~ Red – gelatine	Liquifies	Liquifies.
Black – Bacto-Tryptone broth.	Growth	Growth with lots of sediments.
Yellow – Nitrate "	growth without liberation of gas.	Growth with liberation of a little gas.
White – lactose broth	No growth a little gas produced	Vigorous growth through out the medium with liberation of gas.
Blue – Sucrose "	No growth a little gas	Vigorous growth with liberation of gas
Pink – milk broth. .	Does not Clott milk.	Clotts milk.
(Red) – serum broth. . (Peter)	No growth but a little of gas produced.	Growth with the formation of serum gas liberated.

Apiezon High Vacuum Grease

ARITHMETICAL TABLES

Numeration Table

Units	1
Tens	12
Hundreds	123
Thousands	1234
Tens of Thousands	12,345
Hundreds of Thousands	123,456
Millions	1,234,567
Tens of Millions	12,345,678
C. of Millions	123,456,789

Sterling Money Table

4 Farthings	1 penny	d.
12 Pence	1 shilling	s.
2 Shillings	1 florin	
2 Shillings & sixpence	1 Halfcrown	
5 Shillings	1 crown	cr.
10 Shillings	1 half sov.	
20 Shillings, 1 sov. or 1 pound		£
21 Shillings	1 guinea	

Arithmetical Signs

\+ Plus ; sign of addition
— Minus ; sign of subtraction
× Sign of multiplication
÷ Sign of division
= Sign of equality
: :: : Sign of proportion
$\sqrt{}$ Sign of the square root
$\sqrt[3]{}$ Sign of the cube root
° Degree, ′ minute, ″ second
∴ Therefore

Troy Weight

For Gold, Silver, and Jewels.

24 Grains	1 pennyweight	dwt.
20 Pennyweights	1 ounce	oz.
12 Ounces	1 pound	lb.

Apothecaries' Weight

For Mixing Medicines.

20 Grains	1 scruple	scr.
3 Scruples	1 dram	dr.
8 Drams	1 ounce	oz.
12 Ounces	1 pound	lb.

Avoirdupois Weight

For all Goods except Gold, Silver and Jewels.

16 Drams	1 ounce	oz.
16 Ounces	1 pound	lb.
14 Pounds	1 stone	st.
28 Pounds	1 quarter	qr.
4 Quarters	1 hundredweight	cwt.
20 Cwt.	1 ton	tn.

Hay and Straw Weight

36 lb. Straw	1 truss	
56 lb. Old Hay	1 truss	
60 lb. New Hay	1 truss	
36 trusses	1 load	

Long or Lineal Measure

12 Lines	1 inch	in.
12 Inches	1 foot	ft.
3 Feet	1 yard	yd.
2 Yards	1 fathom	f.
5½ Yards	1 Pole	
40 Poles	1 furlong	fur.
8 Furlongs or 1760 yds.	1 mile	

Cloth Measure

2¼ Inches	1 nail
4 Nails	1 quarter of a yard
4 Quarters	1 yard

Solid or Cubic Measure

1728 cubic inches	1 cubic foot
27 cubic feet	1 cubic yard
24¾ cubic feet	1 solid perch mason's work
12¾ cubic feet	1 solid perch brickwork

Imperial Heaped Measure

		Lbs. Avoird. of Water
8 Gallons	1 bushel	= 80
3 Bushels	1 sack	= 240
12 Sacks	1 chaldron	= 2880

Imperial Dry Measure

		Avoird. of Water—lb.	oz.
2 Glasses	1 noggin	= 0	5
4 Noggins	1 pint	= 1	4
2 Pints	1 quart	= 2	8
4 Quarts	1 gallon	= 10	0
2 Gallons	1 peck	= 20	0
4 Pecks	1 bushel	= 80	0
8 Bushels	1 quarter	= 640	0

Square Measure

144 Square inches	1 square ft.
9 Square feet	1 square yd.
30¼ Square yards	1 square pole
40 Square poles	1 rood
4 Roods	1 acre

Table of Motion

60″ Seconds	1 minute
60′ Minutes	1 degree
30° Degrees	1 sign
12 Signs, or 360°	the circle of the earth

Table of Time

60 Seconds	1 minute
60 Minutes	1 hour
24 Hours	1 day
7 Days	1 week
4 Weeks	1 month
365 Days	1 leap year
366 Days	1 year
52 Weeks	1 year
12 Calendar or 13 Lunar Months	1 year

Days in the Month

Thirty days hath September,
April, June, and November,
All the rest have thirty-one,
Excepting February alone,
Which has but twenty-eight days clear,
And twenty-nine in each leap yr.

MULTIPLICATION TABLE

2 Times	3 Times	4 Times	5 Times	6 Times	7 Times	8 Times	9 Times	10 Times	11 Times	12 Times
1 are 2	1 are 3	1 are 4	1 are 5	1 are 6	1 are 7	1 are 8	1 are 9	1 are 10	1 are 11	1 are 12
2 - 4	2 - 6	2 - 8	2 - 10	2 - 12	2 - 14	2 - 16	2 - 18	2 - 20	2 - 22	2 - 24
3 - 6	3 - 9	3 - 12	3 - 15	3 - 18	3 - 21	3 - 24	3 - 27	3 - 30	3 - 33	3 - 36
4 - 8	4 - 12	4 - 16	4 - 20	4 - 24	4 - 28	4 - 32	4 - 36	4 - 40	4 - 44	4 - 48
5 - 10	5 - 15	5 - 20	5 - 25	5 - 30	5 - 35	5 - 40	5 - 45	5 - 50	5 - 55	5 - 60
6 - 12	6 - 18	6 - 24	6 - 30	6 - 36	6 - 42	6 - 48	6 - 54	6 - 60	6 - 66	6 - 72
7 - 14	7 - 21	7 - 28	7 - 35	7 - 42	7 - 49	7 - 56	7 - 63	7 - 70	7 - 77	7 - 84
8 - 16	8 - 24	8 - 32	8 - 40	8 - 48	8 - 56	8 - 64	8 - 72	8 - 80	8 - 88	8 - 96
9 - 18	9 - 27	9 - 36	9 - 45	9 - 54	9 - 63	9 - 72	9 - 81	9 - 90	9 - 99	9 - 108
10 - 20	10 - 30	10 - 40	10 - 50	10 - 60	10 - 70	10 - 80	10 - 90	10 - 100	10 - 110	10 - 120
11 - 22	11 - 33	11 - 44	11 - 55	11 - 66	11 - 77	11 - 88	11 - 99	11 - 110	11 - 121	11 - 132
12 - 24	12 - 36	12 - 48	12 - 60	12 - 72	12 - 84	12 - 96	12 - 108	12 - 120	12 - 132	12 - 144