"अज्ञान तिमिरा ध्वस्य
ज्ञानाञ्जन शलाकया
चक्षुरुन्मीलितम् येन
तस्मै श्री गुरवे नमः"

गुरुनाथकी

   Ranganayaki

മനുഷ്യാ. വേഗം. വാ

ശ്രീണമ | മനുഷ്യാ. വേഗം. വാ.   V P. Cheats. ~~Ranganayaki~~

മനുഷ്യാ. വേഗം. വാ.

वागर्थौ इव संपृक्तौ। वागर्थ प्रतिपत्तये।

जगतः पितरौ वन्दे पार्वती परमेश्वरौ ॥

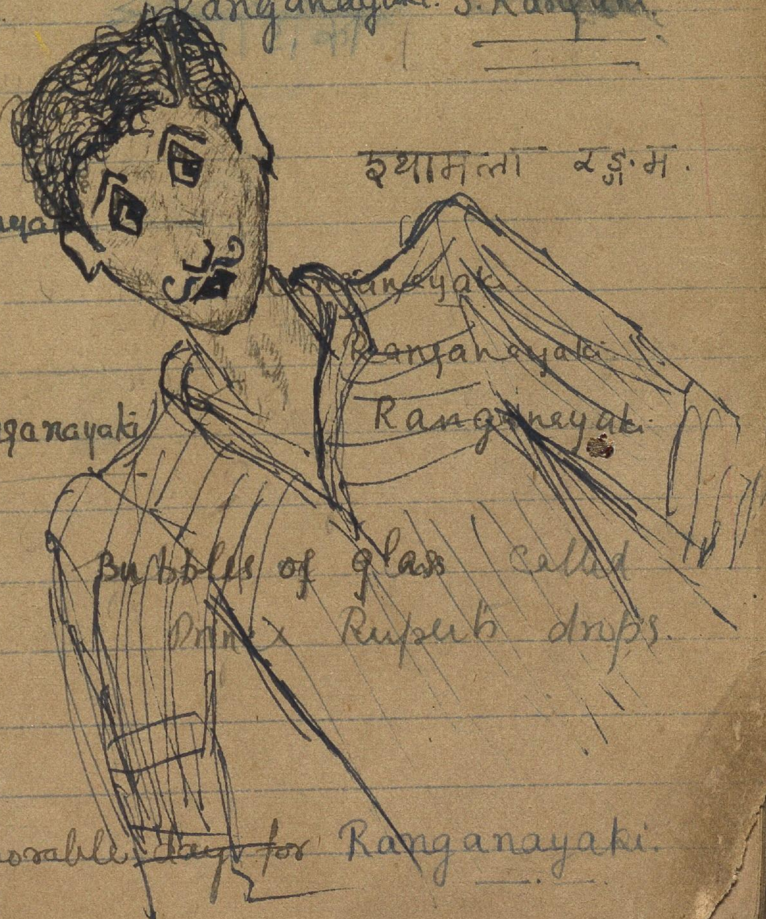
fundamental 

जगत

॥ श्यामला रङ्गम ॥

Rangam

Ranganayaki. S. Rangam.



श्यामला रङ्गम.

Ranganaya

Stiches 15

10 1st line

within 1st[illegible]

18.12.6.6

3.1.2.2

Ranganayaki

Ranganayaki

Ranganayaki

Ranganayaki

31.9.14

8

32.7.8.4

Ranganayaki

Bubbles of glass called

Prince Rupert drops.

24/9/51 Memorable ~~days~~ for Ranganayaki.

J Ranjneyski

Ranganayaki Rangan Ranganayaki Rangan

5. Rangam

The results of researches carried out on the effect of Magnesium ions on the loss of nitrogen of nitrogen in the yeast culture, using ammonium sulphate as the source of nitrogen and sucrose as source of carbon. show that in the set analysed after twenty eight days. there is first a loss of nitrogen followed by fixation of nitrogen upto the concentration of 0·5 gm of $MgCO_3$ per 400 c.c; after that there is rapid fall of the graph line and the cultures show a loss of nitrogen at concentration 0·75 and 1gm per 400 c.c. In another set which was analysed after 43 days, there is a rapid loss of nitrogen observed up to the concentration of 0·75 gm of $MgCO_3$ per 400 c.c of culture after which this loss of nitrogen decrease

so much so that for concentration of 1gm % of $MgCO_3$ per 400 c.c, it is only approximately 68 mg.

For the set analysed after 57 days, the cultures show a rapid decrease in the loss of nitrogen from 0.1gm to 0.175 gm of $MgCO_3$ per 400c.c and at a concentration of 1gm of $MgCO_3$ per 400c.c there is a definite fixation of nitrogen.

Considering this loss of nitrogen on the basis of percentage of loss of nitrogen calculated on the basis of grams of nitrogen consumed during fermentation it has been observed that there is a loss of nitrogen at 0.1gm of $MgCO_3$ per 400c.c followed by a fixation of nitrogen at 0.5 gm of $MgCO_3$ per 400c.c then there is a rapid fall at 0.75 and the loss again decreases as the concentration

of $MgCO_3$ increases in the culture.

The cultures analysed after 43 days show rapid loss of nitrogen at 0·75 gm of $MgCO_3$ and then this loss of decreases as concentration of Magnesium ion increases in the culture.

The culture analysed after 57 days show a gradual loss of nitrogen upto 0·5 gm and then there is decreased loss upto 1gm of $MgCO_3$ per 400 c.c of the culture

The capacity of intake of nitrogen upto 0·5 o grown in cultures containing different concentrations of Mg ions, it is seen that there is increase of nitrogen intake in the cultures of the set analysed after 28 days upto a concentration of 0·25 gm of $MgCO_3$ per 400 c.c. after which there is a tendency of decrease upto 0·75 gm after which it increases

The sel analysed after 43 days shows a gradual decrease of intake of nitrogen up to the concentration of 0.75 gm of $MgCO_3$ per 400 c.c of the culture. Then there is an increase in the graph indicating the growth of grams of yeast by 1 gram of nitrogen, shows almost a horizontal trend up to a concentration of 0.5 gms of $MgCO_3$ per 400 c.c followed by increase at 0.75g and then a rapid decrease.

So it is concluded that the increased concentration of Magnesium ions in the yeast cultures decrease nitrogen loss and percentage of nitrogen loss calculated on the basis of total nitrogen consumed during yeast growth. particularly when the concentration increased above 0.75 gm of $MgCO_3$ per 400 c.c. This decrease in the nitrogen loss is followed by the increase in nitrogen in take of the yeast & decrease in the gms of dry yeast produced per gms of nitrogen consumed. This is found due to the fact that more nitrogen goes inside the yeast cell & is not lost as in the previous cultures. This automatically follows that protein constituent of the yeast should be more at higher concentrations of magnesium

in the Culture. This has been Confirmed by the observation that there is an increase in nitrogen Content of the yeast in all the sets after the Concentration of .75 gms of $MgCO_3$ per 400 cc.

Another set of cultures to be prepared in which $MgCO_3$ is to be varied from 0.75, 1, 1.25 onward.

27. 3. 51 D.K.B.

Allahabad University.

Sucrose culture

The filtrate from pH 3 is found to most deeply colored of pH 5.5 least

Sucrose cultures:

The following substances were weighed.

NaCl – 0.8 g

K_2SO_4 – 0.8 g

NaH_2PO_4 – 0.8 g

$MgCO_3$ – 1.0 g

$CaCO_3$ – 0.8 g.

$(NH_4)_2SO_4$ – 10 gms.

Date of Seeding – 6.3.51

Temp. 28.5°C.

The substances were digested with HCl, filtered and made up to one litre. 250 This was titrated with standard NaOH.

Another similar solution was prepared. To 250 c.c of the solution was ~~mi~~ added distilled water and suitable volume of standard alkali to keep the pH at 3, 3.5, 4, 4.5, 5.0, 5.5 respectively and in each case. 20 gms of sugar Sucrose were added. The total volume of culture being 400 c.c. & Seeded after sterilisation & incubati

Analysis

Date 10. 4. 51

Temp – 28°.8 C

1 — 0.8296

1, — 0.8550

$CaCO_3$ – 0.2g
NaCl – 0.2g
K_2SO_4 – 0.2g
Na_2HPO_4 – 0.2g
$MgCO_3$ – 0.25g.
$(NH_4)_2SO_4$ — 2.5g
Sucrose – 20g.

Date:– pH. 3.

Total acid.

10c.c soln × NaOH
0c.c
6.8c.c > 6.8c.c
7c.c.
13.8c.c > 6.8c.c

[N_2 / NH_3] 40c.c. soln distilled in 100c.c acid & titrated with std alkali

'2
44.9 > 44.7c.c

Wt. of the yeast. 36.6310
36.5500
1.0810 g. in distilled water 100c.c.
1.2 / 21.2 / 21.4

Red Sugar.

C

3c.c diluted in 75c.c.

hypo 8.4
44.7 > 36.3

20c.c diluted to 100c.c

R.S. 21.9
39.1 > 17.2 c.c

25c.c T.S. → 100c.c
21.8
49.0 > 17.2

40c.c in 100c.c

Estimation of alcohol — Distilled repeated with potash

Wt. of R.D. bottle 25.9848
+ dist. water → 65.6200
1. 65.3112 g. distillate

Volatile acid 50c.c titrated with alkali

13.6.51
27.2
new 28.2 > 1c.c

[13.6.51] total N_2
0.2
50
51.3 > 51.1
new acid

Wt of yeast. 1 — 4.8696
1, — 0.9500

C of yeast
distilled in 100c.c. in the soln (new)
32.6588
32.55
0.1088 g.

hypo 10.4
46.5 > 36.1

N in yeast cells — to be repeated. 2. — 0.8415
2, — 0.8738

N of the yeast Repeated
33.5650 g.
32.55
1.0150 g. 0 > 22 c.c.
22

pH. 3.5

Total acid. 14 > 6.3 c.c
20.3

20.4 > 6.3 c.c
26.7

Carbon

5c.c distilled in 60c.c

hypo. 2 > 22.5 c.c
24.5

R.S [20 c.c → 100 c.c]

34.7 > 19.3 c.c.
54.0

T.S : 20 c.c → 100 c.c

33.6 > 19.3 c.c.
52.9

2 — 4.4686
2, — 0.9946

N_2 distillable by NaOH. 40 c.c.
distilled in 100 c.c. acid.

1.5 > ~~43.15~~
~~44.65~~ 43.2 c.c.
44.7

~~N of the yeast~~

Alcohol

(2) 65.6200

Vol. acid 50 c.c titrated

28.3 > 3.3 c.c
31.6

N_2 ~~4 c.c.~~ in 100 c.c

1.4 > 49.0
50.4

C of the yeast ~~residue~~ in [illegible] (new).

N of the yeast
33.6382 ✓
32.55
1.0882 g.

32.6436
32.5500
.0936 g.

hypo. 8.9 > 34.1
43.0

0.8 > 31.8 c.c
32.6

3 — 0.8335
3_1 — 0.8766

pH 4.

T. Acid. 1.1 } 5.8 c.c
6.9
6.9 } 5.8 c.c
12.7

N_2 distillable by NaOH. 40c.c in 100c.c …
.3 } 41.2 c.c
41.5

Cu

5 c.c. diluted in 75 c.c. of Iodine solution.

hypo. 4.6 } 40.4
45.0

1.5 20 c.c in 100

Cu of the gear distilled in 100 c.c. of the new Iodine sol.

21.7 } 17.6
39.3

13.4.51 C₂H₅OH
Wt – 65.6106
V. Acid. (50c.c)
31.6 } 1.6
33.2

32.6730
32.55
.1275
5.65
32.15
2.650

20 c.c in 100 –
19 } 17.6
36.6

13.3.51

N_2 40c.c. solution in 100c.c of new Dil H_2SO_4

new alkali & acid

0.5 } 46.9 c.c
47.4

N of the gear
33.6252 g.
32.55
1.0752

0 } 13.9 c.c
13.9

3 — 3.9800
3_1 — 1.0305

Cu of the gear
32.7160
32.5560
0.1600

10.5
2
12.5

4 — 0·8830
4_1 — 0·8780

pH 4·5

Acid. 1·5 / 5·7 > 4·2 c.c
5·8 / 16·0 > 4·2 c.c

R.S. 20cc in 100
26·8 / 43·2 > 16·4

T.S. 20cc in 100.
24 / 39 > 15·0 cc.

N_2 distillate by NaOH
0c.c. / 34·8c. > 34·8 c.c

Alcohol.
Dish — 65·6070
V. Acid (50 c.c. with [illegible])
33·4 / 34·8 > 1·4 c.c

?
5 c.c of 3[illegible] in 50 c.c of old I_2 soln.

new hypo 2·5 / 23·2 > 20·7 c.c

K. 4.51 N_2 40 c.c. distilled in 100 c.c acid.
0 / 37 > 37 c.c

Wt of filter papers
4 — 2·9972
4_1 — 1·0104

N_2 of the year :— 33·5300
32·5500
·9800

14·0 / 33·9 > 17·9

C/ of the year — [illegible] 100 c.c [illegible] (new).
32·6530
32·55
·1030 g.

hypo 5·95 / 37·80 > 31·85

5 — 0.8179
5_1 — 0.8532

pH 5 — N_2 distilled —

T.A.
10.1 / 14.4 > 4.3 c.c
1.4 / 5.7 > 4.3 c.c

0c / 34.3 > 34.3 c.c

R.S. 20 c.c in 100

26.9 / 42.7 > 15.8.

T.S.

30.4 / 43.6 > 13.2

C/ 5 c.c distilled in 70 c.c. NH_2

new hypo
4.2 / 24.3 > 20.1 c.c

EtOH

Distillate 65.6046

V-Acid (50 c.c x alkali)

34.8 / 36.2 > 1.4 c.c

N_2/ 40 c.c in 100 c.c acid

0 / 36.5 > 36.5 c.c

Nitrogen in yeast
33.4630 g.
32.5500
0.9130

diluted 100 c.c. taken
21.4 / 40.8 > 19.4

5 — 2.9932
5_1 — 0.9938

C/ in yeast.
32.6760
32.55
.12609.
in 100 c.c. iodine taken
hypo
24 c.c.

b — 0.8567
b_1 — 0.8738

H_2 5.5.

5.7
10.2 > 4.5 c.c
10.1
14.6 > 4.5 c.c.

C 5cc distilled in 50 c.c I_2

36.5 > 9.4 c.c
45.9

R.S 20 c.c & 1WC.C

6.8 > 15.3
22.1

7 > 15.3c.c
22.3

T.S 6.1 > 14.8 c.c
20.9

~~21.1~~ > ~~15.4 c.c~~
36.5

10.2 > 14.8 c.c.
25

N_2 in year 33.4500
32.5500 0.1 > 25.6 c.c
0.9 25.7

1 > 34.9 c.c.
35

FEO II

Distilled - 65.6040

V. Acid; (50 c.c exalic)

8 6.2 > 1.5 c.c
37.7

N_2 40 c.c distilled in 1WCC used

0 > 38.3 c.c.
38.3

b — 3.1420
b_1 — 1.0110

C of the year. typo

33.6770 g 25.1 c.c
32.55
.1270 g.

9/3/51. Lactose cultures.

The amount of lactose equivalent in carbon content to 20 gms of sucrose.
Wt of lactose added in each culture is 19·05 grams.

Date of seeding - 15.3.51

Temp. 28°·4C

22.3.51. ~~pH~~: 3. no growth of yeast is observed. (seeded on 12.3.51)

3.5 - trace of yeast on surface is seen

4 - fairly good growth

The following seeded on 15.3.51

5.5, 4.5 & 5 indicates some growth of yeast.

Excepting 4, all were seeded.

16/4/51 Standardisation of dil. H_2SO_4 — [To be used in the N estimation of yeast of culture no 2, 4, 5, 6 and ...]

alkali is standardised previously. That alkali is used for this titration.

dil H_2SO_4 10 c.c. 8·65 / 23·85 → 15·2

by caustic . dil to opposite → 10 c.c. dil H_2SO_4

23·9 / 34·3 → 10·6 c.c. ✓

34·3 / 44·8 → 10·5 c.c.

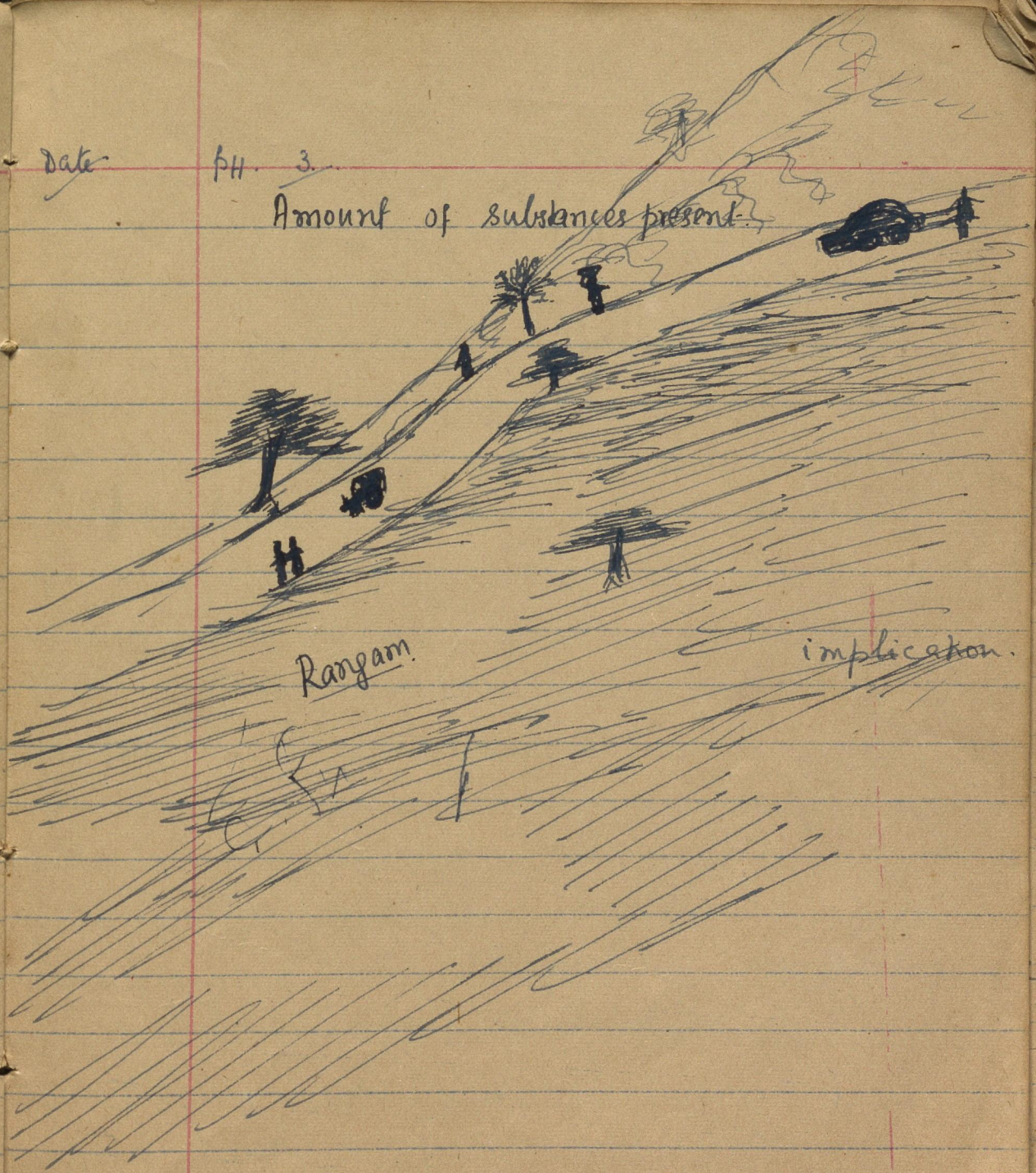
~~44·58~~

2·4 / 12·9 → 10·5 cc

Date

pH. 3.

Amount of substances present.



Rangam

implication.

pH 3.5

pH 4. Thiosulphate x $CuSO_4$ (10g in 200 c.c.)
10 c.c

4.6 > 6.9 c.c
11.5

Thio sulphate x Iodine old.

12.4 > 12.3 c.c
24.7

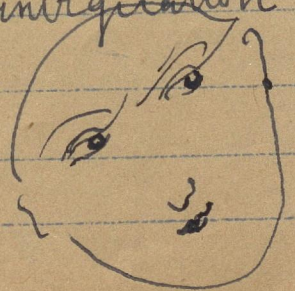
S_3. Alkali x Oxalic acid. (0.63 in 200 c.c.)
10 c.c

.3 > 2.9 c.c
3.2

Alkali x H_2SO_4 [C]

3.3 > 7.4 c.c
10.7

S. Ranganeyaki. S. Ranganeyaki.
S. Ranganayaki. invigilation.
. invigilation invigilation
invigilation Ranganeyaki.



Dep — 1033-0-0 (65) = 1098-0-0 | 1098-0-0 + 70-0-0 = 1168-0-0

[illegible]

Curtains —	10-0-0	Chadar —	12-0-0
Tea —	10-0-0	Invitation —	8-8-0
Milk & Nameed —	5-0-0	Pipe —	30-0-0
House —	135-0-0	Convey —	1-0-0
Mess	250-0-0	Nut —	6-8-0
Cement etc	60-0-0	Printing cards —	5-0-0
Picture	8-0-0	Conveyance —	1-0-0
Nails	6-0-0	Ham Labour —	20-0-0
Mother	15-0-0	Cement —	12-0-0
Ghee	34-6-0	Wheat —	29-0-0
Conveyance & Cigarette	2-12-0	[illegible]	915-15-0
Sugar	24-12-0	Mother	10-0-0
Maida	4-0-0	सौगात	2-0-0
sack	1-5-0	Pocket exp. & Cigarette.	1-8-0
Labour	50-0-0.	Invitn card	4-12-0
Thesis binding	18-0-0		934-3-0
fan	22-12-0	[illegible] Electricity	5-0-0
Saree	75-0-0	Conveyance & cigarette	1-8-0
Blaz	14-0-0		940-11-0

Total 940-11.0

Pthg/Cloth. 18-9-0

Riksh 3-0-0

962-4-0

Fruits & cigarette 2-0.0

964-4-0

18th/ Rikshe 1-0-0

Radio rep. 3-8-0

nuts 1-2-0

fruits & cig - 1-0-0.

970-14-0

19th/ Cinema - 6-0-0

Sweet - 1-0.0

977-14-0

20th. Rik etc - 2-0-0

Bangles - 1-0-0

Box - 4-0-0

Paint - 9-0-0.

Some family misc - 10-0-0

21st Labour - 10-0-0

Coal - 5-0-0

Khoa - 10-0-0

Puja - 5-0-0

[illegible] - 2-8-0

Veg. 1-0-0

Charcoal - 0-12-0

Rik - 1-0-0

1039-2-0

22nd. Riksha - 1-4-0.

Lawa - 2-0-0.

Silver sheets - 2-0-0.

Sohagpura - 1-4-0

Paper 1-0-0.

7-8-0

Hall - 35-0-0.

R. 15-0-0.

Mirror - 2-0-0

67-0-0

1106-2-0

Fruits & Riksh. & cigarette. 3-0-0

pathel 2-12-0

Kettle [illegible] 1-0-0

[illegible] pot 1-9-0

Lantei 2-4-0

1116 - 11 - 0

pH 5.5 Veg. — 1.40

1117 = 15 - 0

1098
971
127

16.3.51

Ethyl alcohol:

Equivalent amount of ethyl alcohol is: 14.6 gms or 18.5 c.c.

Amount of substances present in each culture:

$CaCO_3$ — 0.20g.

NaCl — 0.20g

K_2SO_4 — 0.20g Rangam.

Na_2HPO_4 — 0.20g

$HgCO_3$ — 0.25g.

$(NH_4)_2SO_4$ — 0.5g.

Date of seeding — 17.3.51

Temp — 31°.2 C

Results from control culture:

Wt of R.D. bottle — 25.9848

+ distilled water — 65.6200

Wt of R.D. bottle + distilled soln } = 65.3000

49.3840 / 49.704 = .9936

65.6200
15.9160
49.7040

65.3000
15.9160
49.3840

Date. 17. 4. 51.

Temp – 33.8 C.

1. – 0.8500
1, – 0.8546

pH. 3.

N_2 distillable by NaOH.

4 c.c in 100 c.c H_2SO_4 (A)

1.350
.2 – 9.7

[59.5] S_1

Carbon estimation in soln.
5 c.c in 100 c.c I_2.

3
50
d22 > 47 } 50 c.c hypo
5.7 > 3

Alcohol. 100 c.c distilled

R.D. bottle + Dist. water = 65.5552 g. (65.5552)

+ soln : 65.5100 g

S_2 vol. Acid: .3 > 0.9 c.c
1.2

N_2 after Kjeldahling
S_2 0.1 > 37.5 c.c (H_2SO_4 A)
37.6

S_2 Total acid 10 c.c soln: 6.6 > 5.9
12.5

12.6 > 5.9
18.5

C/ see after evaporation in 100 c.c I_2.

C/ 5 c.c. soln in 50 c.c old I_2
new hypo > 49.35 c.c.

2 >
50 1.8 > 57.1 c.c
10.9

Wt of filter paper.

1 – 4.3236

1, – 0.9100

N_2 in yeast. 33.5800 in 100 c.c H_2SO_4 C
32.5500
1.0300

Carbon in yeast.

32.6650 g.

32.55
.1150

Tire value Alkali S_3 .1 > 45.4 c.c
45.5

120 c.c I_2 soln
hypo. 78.4 c.c

2 - 0.7580
2, 0.7000
[since I_2 has evap]
C// 5c.c in 100 c.c. I_2

pH 3.5 N_2 dist. by NaOH.
40c.c. in 100 c.c H_2SO_4.

[S_1] 0 / 60.2 > 60.2c.c

0 1.4 >

C/ 5c.c in 50c.c. I_2

18.8 / 31.8 > 13.0
35 / 48.0

47.9 / 1.6 / 46.3 / 48.5 — 50, 3.1 / 2 / 3.6 > 49.5c.c
rf. 1.5 / 50 / 2.0 / 10.8 > 88.3

N_2 after K.

S_2. 0.2 / A. 32.4 > 32.2 c.c

Alcohol: 65.5112 g

V.A. 1.3 / 2.2 > 0.9 c.c.

Wt of filter paper:
2 — 4.2536
2_1 — 0.7512

C in soln - nonvolatile
2.6 / 44.8 > 24.8c.c

T. Acid 18.5 / ~~24~~.5 > 6.
24.5 / 30.5 > 6

5c.c soln after drying in ~~50c.c~~ 50c.c old I_2

new hypo. 52.5 c.c.

N_2 of the yeast. 33.6000
32.5500
1.0500 g.

dist in 100c.c H_2SO_4.(C)

Alkali S_3. 30.95c.c

Carbon of yeast:
100c.c. I_2 32.6996 g.
hypo 32.55
65.3c.c .1296g.

84
65.3
18.7 — .1296g

3 — 0.8420
3_1 — 0.7346.

bH 4. N_2 distillable by NaOH.
40 c.c in 100 c.c H_2SO_4.

[S_1] 9.8 / 50 > 59.8
12.6.

C. after drying
5 c.c in 50 c.c $\frac{1}{2}$
2.2 > 26.1
Rd / hypo

C — 5 c.c in 100 c.c
2.05
48.05 > 46 c.c

5 c.c. in 50 c.c $\frac{1}{2}$
2.2 > 18 c.c
18.2 / 35
53 c.c

Alcohol. 65.5178

VA 2.4 > 1.3 c.c
3.7

N_2 after bjn 0.9
S_2 23 > 22.1 c.c

T.A 0.1 > 6.4 c.c
6.2

6.2 > 6.0 c.c 6.0
12.3

~~41.15~~ >

N_2 of filter paper.
3 — 4.4194
3_1 — 7952

C/ 5 c.c soln after drying in 50 c.c rd $\frac{1}{2}$
new hypo > 1.8 > 49.4 c.c
~~40 c.c~~ 50 / 48.2
T 8.9 > 1.2
10.1

N_2 of the yeast
H_2SO_4. c — 33.6791 1.1296
Alkali. S_1 32.5500
45.5 c.c

C of yeast.
in 125 c.c $\frac{1}{2}$
32.7592
32.5500
0.2092
$\frac{2}{4}$ > 12.5 c.c
36.5
.2092 — 75.0

4 - 0.8448
4, - 0.8484

pH 4.5 N_2 distillate with NaOH.
40 c.c. in 100 c.c

S_2. 0 > 29.1 c.c
29.1

Alcohol 65.5240

S_2 v.A 3.8
4.65 > 0.85

T. Acid 12.5 > 5.9
18.2
18.2 > 5.9
24.1

Alcalis? N_2 33.7062
g yeast 32.5500
1.1562 g.
in 100 c.c
C. hypo 42.3 c.c.

·17

·3.5
14
20
87.5
12.5
75.0

77
14.4
62.6 c.c.

·17

C/ 5 c.c in 60 c.c I_2

2.3 > 24.5 c.c
26.8
(52.5)

C/ 5 c.c. after
wash in 50 c.c I_2 sol.
New hypo — 2/50 > 48 (49.6)
+ 2.4/4 > 1.6 N_2 after K: S_2.

B. 1286

Wt of filter paper.
4 — 4.4646
4_1 0.9054

C of yeast.
32.7200
35.5500
0.1700
in 110 c.c iodine
37.7 > 14.4 c.c
52.1

5 — 0.8674
5, 0.8740

pH 5. N2 dil by NaOH. C/ 5c.c in 50c.c I2
40c.c in 100c.c H2SO4 (A)

(S2) 0 > 28.5c.c
28.5

30.6 > 18.2
48.8
(53.2)

5c.c soln after evap. in 50c.c I2 sol.

new hypo 3.9 > 43.6
47.5

Alcohol — 65.5000

T.A. 10c.c.
~~27.55~~
24.2 > 5.9
30.1

V. Acid 4.8 > 0.7
5.5

N2 after K.
H2SO4 (B) 99.4
S2 29.8

No of Wt of filter papers
5 — 4.4560
5, — 0.9200

N in yeast
Alc. S3 33.67 37
~~10.9~~
H2SO4 C. 32.55
1.1237 gs

100 c.c.
I in yeast. 10cc I2
32.6274 .0774 g
32.5500
0 > 60.4 cc
60.4

Iodine value — 42.9cc
.077
.077

100cc → 70
70.4
60.4
10.6 c.c. of hypo

6 — 0.8320
6_1 — 0.8570

pH 5.5 N/2 by NaOH.
100 c.c. = 10 c.c. H_2SO_4 (N)

[S_2] 0.1 > 26.5 c.c
26.6

4 c.c. in 50 c.c. I_2

9.3 > 19.4
28.7
54.4

T.A.
10 c.c.
30.1 > 4.9
35.0

Alcohol — 65.4957
5.7 > 0.7
6.4

N/2 after K_2

H_2SO_4 [S_1] 0.1 > 21.4 c.c
21.5
S_2

Wt of filter papers
6 — 3.8876
6_1 — 0.9000

5 c.c soln after evaporation in 50 c.c. of I_2

N/10 hypo. 2.5 > 45.6
48.1
100

N in yeast
[Alk. S_3] 33.6182
[H_2SO_4 C] 32.55
1.0682 g.

C in yeast 100 c.c I_2
32.6400
32.5500
0.0900

2.1 > 67.6
69.7

0.8 > 42.6 c.c
42.9

0.09
2.4 c.c. glycine.

28.3.57 Glucose cultures.

Amount of glucose

= 20.96 gms

Each culture contains

$CaCO_3$ – 0.20g

Na Cl – 0.20g

K_2SO_4 – 0.20g

Na_2HPO_4 – 0.20g

$MgCO_3$ – 0.25g

$(NH_4)_2SO_4$ – 2.5g.

Date of seeding: 30. 3. 51　　　Date of analysis. 30. 4. 51.
Temp. 24°. 8.　　　Temp - 34.5 C

pH 3　1 — 0.7360 g — 3.2450 g T. Acid　6.3 / 9.0 > 2.7 c.c

1 — 0.7168 g — 0.8020 g.

N_2 distillable by alkali:　　Alcohol - wt of bottle - 15.9160

40 c.c soln in 100 c.c. A_1.　　+ dist. water - 65.6566.

+ distillate - 15.1520

S_1 > 82 c.c

5 c.c. in 50 c.c (Iodine solution)　　V. Acid

20.4 / 37.5 > 17.1　　　50 c.c distillate 13 / 13.7 > 0.7 c.c

34.3 / 50.7 > 16.4

Total N_2

R. Sugar　0.1 / 10 > 9.9 c.c.　　40 c.c in 100 c.c　0 / 61.4 > 61.4 c.c

5 c.c dil to 100 c.c

10.5 / 20.6 > 10.1 c.c

N in the yeast - 33.2336
32.55
00.6836 g.

distilled in 50 c.c. Dil H_2SO_4 —
0.2 c.c. / 15.6 c.c. > 15.4 c.c.

C in yeast.
yeast = 32.6550 g
32.5500
0.1050 g.

Cn　100 c.c. of iodine solution　0.7 / 76.0 > 75.3 c.c

pH 3.5 2 – 0.7068g – 2.7190g. T. Acid 9.1 / 11.6 > 2.3 c.c

2₁ – 0.7418g – 0.8530g.

N₂ by [illegible] 0.2 / in 50 > 0 / 27.65 > 77.45 c.c. –

Alcohol 65.6536

8.9 A₁

V. Acid 13.9 / 15.1 > 1.2 cc

40 c.c 80h in 100 c.c acid.

c – 5 c.c. [illegible] in 50 c.c. (new [illegible] Solⁿ)

8.7 / 19.9 > 11.2 c.c.

Total N₂ – 40 c.c in 100 c.c H₂SO₄

58.9 c.c

R.S. 125 c.c to 100 c.c.

c in yeast.

0 / 8.2 > 8.2 c.c

32.6322
32.5500
00.0822 g

Nitrogen in yeast. –

33.0938 g.
32.5500 g
0.5438 g.

g in 15 c.c. iodine.

distillation 50 c.c.

22.2 / 43.4 > 21.2 c.c.

17.7 / 98.5 > 80.8

N in yeast – 32.8500 g. a
32.5500
00.3000 g.

distillation 50 c.c. 0.9 / 22.15 > 21.25 c.c.

pH 4. 3 — 0.7810 g — 2.2432 g. ~~T. Acid~~ 11.5 > 2.2 c.c
[yeast was filled no 3₁] 3₁ — 0.7206 g — 0.8700 g   13.7

N_2 by wt 40 c.c in 100 c.c   Alcohol   65.6600
    T. Acid 15.2 > 1.9 c.c
    17.1
3₁ Acid 0 > 75 c.c
75

5 c.c distilled in 50 c.c I_2.

~~C~~ 57.4 > ~~22.6 c.c~~ —
80.0
9.4 > 12.3 c.c
21.7

~~R.S~~ 0.7 > 8.2 c.c.
8.9

@ in the cul.
5 c.c. distilled in 50 c.c. of the new iodine sol.

~~63.8 > 15.1~~
~~78.9~~
~~no. 16~~
~~79.3~~

79.3 > 11.3
90.6

~~Total N_2~~ — 40 c.c dist in 100 c.c H_2SO_4
4 c.c
55.4 c.c alk

3
0.7
9.6 + 20.6 > 29.4
50.0 > 9.6
39.0 c.c.

Nitrogen in yeast — 32.8666
32.55
0.3166 g

@ in yeast 32.6400 g distilled in 50 c.c. H_2SO_4
32.5500 g   +5
.0900   = 55 c.c.

distilled in 50 c.c ~~of dil H_2SO_4~~

63.7 > 13.1
76.8

pH 4.5 | 4 — 0.7022 – 3.1242 g ? Acid | 14.2 / 16.8 > 2.6 c.c
4₁ — 0.7200 – 0.7900 g Alcohol

N_2 by alk / 40 c.c in 50 c.c acid

AgS₁ 0 / 24.6 > 24.6 c.c

v. Acid 65.6564 / 17.3 / 18.75 > 1.45 c.c

Rep 27.7

C/ in culture 5 c.c distilled in 50 c.c I_2

— 15.1 c.c.

Rep 22.6 c.c

Total N_2 100 c.c distil in 58.6 c.c alk
100 c.c H_2SO_4

R.S. 25 c.c to 100 c.c dil

0.4 / 10.4 > 10 c.c.

0.17

Nitrogen in yeast — 33.2530
32.55
0.7030 g.

9.6 / 24.7 > alk 15.1 c.c.

distilled in 50 c.c. dil H_2SO_4

C in yeast

32.6925
32.5500
0.1425

Hypo. 11.7 / 63.4 > 51.7 c.c distilled in 10 c.c. iodine

pH 5 filter paper → 5 – 0·7200 → 0·8200 g. 7. A.

5, 0·7262 → 2·5970 g. 1

16·9
19·1 > 2·2 c.c

N_2 by alk – 40 c.c in 80 c.c Acid
0
36 > 36 c.c.

A. 65·6450
9 [illegible] Acid.
19·5
21·3 > 1·8 c.c

25 c.c dil. R.S
[illegible]

1·8
10·3 > 8·5 c.c

~~[illegible] yeast.~~
~~32·6246 g.~~
~~32·5500~~
~~00·0746~~

~~[illegible] The [illegible]~~
5 c.c in 50 c.c. [illegible]

53·5
61·0 > 7·5

18·7
33·0 > 14·3

[illegible] in the yeast.
32·6664 g
32·55
·1164 g [illegible]

Total N₂

57·8 c.c alkali

40 c.c dist in
100 c.c H_2SO_4

50 c.c. [illegible]
+ 50 c.c
? = 100
↓
hypo
65 % c.c

N in yeast = 33·0938 g.
= 32·5500 g.
~~·138~~

N in yeast = 33·0850 g.
32·55
0·5350 g

24·5 c.c
49·9 > 25·4 ✓

+1·5
10·3 > 8·8

34·2
31

pH 5.5   b — 0.7512 → 2.4848 g. T. Acid   19.2 / 21.3) 2.1 c.c

b_1 — 0.7[illegible]60 → 0.7877 g.

N_2 by alk.   0 / 22) 22 c.c   40 c.c in [illegible] c.c Aq.

Rep. 21.4 c.c

Kieselguhr. 65.7200

g. Acid. 21.6 / 24.7) 3.1 c.c

R.S   0 / 8.4) 8.4 c.c

Total N_2 → 40 c.c in 100 c.c [illegible]

56.3 c.c

C in alk.

5 c.c. in 50 c.c. new iodine soln.

41.8 / 53.3) 11.5 ✓

alkali

11.4 / 36.8) 25.4 ✓

Nitrogen in peat = 33.0422 g
32.33

0.4922 g

distilled in 50 c.c. H_2SO_4

C in peat
32.6556 g
32.33

.1056 g — distilled in 50 min + 50 c.c.

H_2SO_4 0 / 65.1) 65.1 c.c.   9.6 / 78.3) 68.7 c.c   + 100 c.c. [illegible]

H_2SO_4

for gl. cultures

Alkali [S_1] — 10 c.c of ex. acid requires 6.1 c.c
Jelly

H_2SO_4 [A_1] — 10 c.c of H_2SO_4 requires — 10.8 c.c of
alkali.

Alkali used for finding % Acid.

10 c.c of oxalic acid (0.63 g in 250 c.c)

0 → 3 c.c 3.3 → 6.15 → 2.95

Thio Sulphate × $CuSO_4$ —
6.9 c.c 10 c.c

Thio Sulphate × Iodine. (used in analysing gl. cultures)
14 c.c 10 c.c

5 c.c of Fehling's A + 5 c.c B. = .051 g of sugar

Thiosulphate — Exa.

$CuSO_4$ soln strength.

Acid used for estimating V. Acid

10 c.c oxalic acid requires ~~7 c.c~~ 5.8 c.c alkali
12.8

Alkali used for estimating N_2 after Kjeldahl
in soln is same as V. Acid.

10 c.c acid used requires ~~[illegible]~~ 10.5 c.c alkali

N_2 by alkali — 4 & 5 to be repeated.
Total N_2 — 3 to be repeated

2nd May '51. When the concn of $(NH_4)_2SO_4$ is increased, the growth of yeast.

When yeast is grown in cultures conty higher concn of $(NH_4)_2SO_4$, there it is observed that there is a time lag in yeast growth in these cultures and after 5 days, vigorous growth of yeast observed in cultures having higher p.H. whereas at lower concn of $(NH_4)_2SO_4$, greater growth of yeast observed at lower p.H.

Standardisation of Indigo

10g of $CuSO_4 \cdot 5H_2O$ in 250 c.c.

10 Cubes.

53.0 c.c → 6.9 c.c.

59.9

10 c.c.

60.3 → 13.2 c.c.

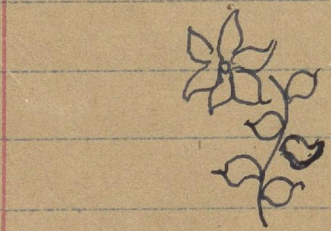
73.5

73.9 → 14.2 c.c.

88.1

14 c.c.

DAMN



Preparation of sucrose cultures.

Date of seeding: 27.4.51

Temp: 35°C

The amt of substances present in each.

$CaCO_3$ — 0.25 g

$MgCO_3$ — 0.25 g

NaH_2PO_4 — 0.1752 g

NaCl — 0.2 g

K_2SO_4 — 0.2 g

$(NH_4)_2SO_4$ — 3.75 g

The total volume = 400 c.c

Sucrose 20 gm

The opt. C/N ratio is kept 3/2 of the previous set.

pH 4.00. 1.

Wt of filter paper — I_1 — 0.7554 gm

I_2 — 0.798 gm

Ranjan

I'll smash your head if you pretend any more.

13956) 174586 (12·51
13956
35026
27912
71140
69780
1360

13956) 174313 (12·4
13956
34753
27912
68410
55824
12586

13956) 173448 (12·43
13956
33888
27912
59760
55824
3936

13956) 371530 (2·66
27912
92410
83736
86740
83736
3004

13956) 361530 (25·9
27912
82410
69780
12630
12536
94

13956) 397530 (28·4
27912
118410
111648
67620
55824
11796

13956) 388880 (27·9
27912
109760
97692
120680
111648
90320

0.0040153
.0004
4.3 2. 0.0036153 2, - 0.7530.
0.7164.

II 250 c.c contain 0.0040153 .0040153
shld contain ~~0.0003000~~ .0003
.0037153
~~0.0037.153~~
Alk to be added - 0.0039153 = 2.66 c.c 26.6
0.0001 3956 25.9 c.c

.001 x 400 / x 100 = 3.5
0. 0040153
.0001265
.0038888 Alk = 27.9 c.c

Repeat
4 0.0040153
.0000400
.0039753 Alk = 28.5 c.c

250 c.c contain 0.00174713
0.00001265
4.5 .00173448

Alk = 12.43 c.c

Hopelessly bad. Just like the master
9/11/57

·422

13956) 58910

55824 1

30860

27912

29480

27912

15680

13956) 61645 (·442

55824

58210

55824

23860

pH 4.57

2. $3_1 - 0.7500$

$3_2 - 0.7422$

---

5 0.0017 4713

0.0000 0400

0.0017 4313

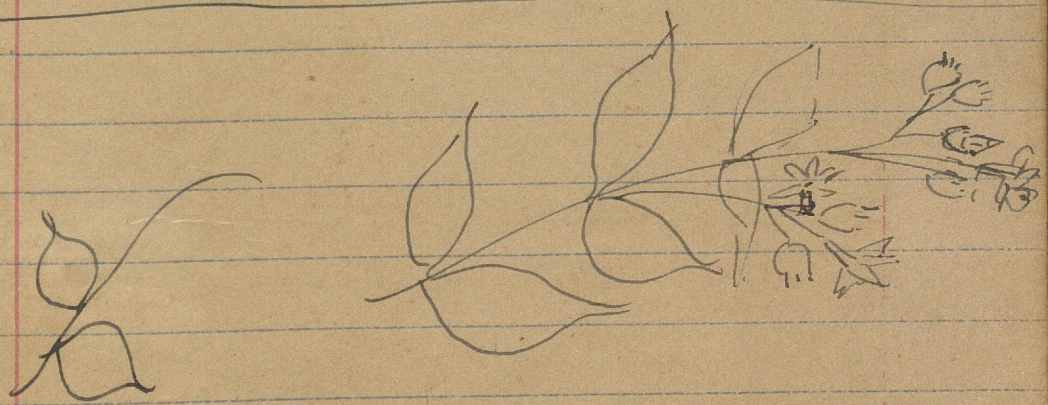
Alk = 12.5 c.c

6.5 0.0017 4725

.0000 1265

.0017 4586 0

Alk = 12.51



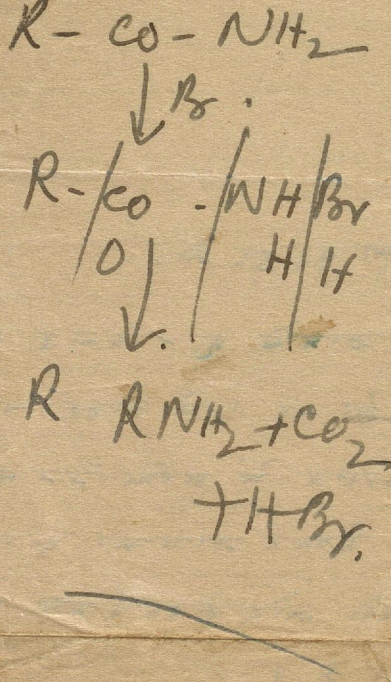
BABU RAM SAKSENA,
M. A., D. LITT.,
PRINCIPAL.

K. P. UNIVERSITY COLLEGE,
ALLAHABAD,
DATED 3.11. 195 .

प्रिय कृष्ण बहादुर जी,

आपके शुभ विवाह का निमन्त्रण मिला था। मैं बाहर था इस लिए उत्सव में सम्मिलित न हो सका। ईश्वर आपका दाम्पत्य जीवन सुखी और हर्षमय करे यही प्रार्थना है।

आपका
बा. बूराम सक्सेना


R - CO - NH2
Br
R - CO - NH Br
O H H
R
RNH2 + CO2
+ HBr

I pH 3

0.005062
·000400
0.004662

Alk to be added. 0.00466200 / 0.00013956

33.4 c.c

II pH 3.5

0.005062
0.0001265
0.0049355 = 35.36 c.c

III

0.005062
·000040
·005022

·005062 / ·00013956 = 36.27 c.c

IV

0.00122375
·00001265
·00121110

·00121110 / ·00013956 = 8.68.

V

0.00122375
·00000400
0.00121975 = 8.74

VI

0.00122375
·00001265
122485 = 8.76

4 used for pH 5 &
5 used for pH 4.5.

interchange

pH 4.85

4.

$4_1 - 0.7550$

2

$4_2 - 0.7384$

13956) 466200 (33.40
41868
47520
41868
55520
55824
00696

13956) 493550 (35.36
41868
74870
69780
50900
41868
90320
83736
6584 0

13956) 121110 (8.678
111648
94620
83736
108840
97692
11148 0

13956) 121975 (8.739
111648
103270
97692
55780
13956) 506200 (36.27
41868
87520
83736
37840
27912
99280
97692
1588 0

13956) 122249 (8.76
111648
106010
97692
83180
83736

$n^{2}-1$

$\frac{1}{n^2}$

~~IX~~ 7.15 c.c of alkali ~~II~~

~~Alk~~ 11·4

10c.c of oxalic Acid (0·6303 in 250 c.c.)

require —

~~Alk.~~ (9)

Alk. —

10c.c Sol I

.1641

13956) 22910
13956

89540
83736
58040
55824
2216

·00013956 × ·45
69780
55824
·000062802

0.00013956 × 11.1
13956
13956
13956
0.001549116

0.00006281

.41044.

15493) 63590
61972
16180
15493
68700
61972
67280
617

1·5
15493) 23709
15493
82160
77465
46950
46478
4710

1

13956) 50260 (·36
41868
83920

15493) 33709 (2·175
30986
27230
15493
117370
108451
89190

11·10
10·95
·15
11·1

pH 4.91

5. 5_1 – 0.7174

5_2 – 0.7538

---

1 c.c of alk 9 neutralises 0.00013956 g of H^+

∴ 0.45 c.c neutralises 0.00006280 2

10 c.c of soln + 0.0000001045

contains. 0.0000629065

3) 400 c.c soln shld contain 0.0003

H^+ to be added 0.0003

0.00006291

0.00023709

10 c.c of acid no 8 requires 11.1 (10.95) c.c of base no 9.

1 c.c of alk 9 ---- 0.00013956 of H^+.

∴ 11.1 c.c will neutralise

= 0.00013956 × 11.1

∴ 10 c.c of acid ~~neutralises~~ contains

0.001549116

0.000000216

0.001549332

3 1c.c of acid contains — 0.000 154 9327

∴ Acid to be added = $\frac{0.000\,33709}{0.000\,15493}$ — 2.175

= 1.53

3.5 Acid to be added $\begin{cases} 0.00012655 \\ 0.00006291 \end{cases}$

$= \frac{0.00006359}{0.00015493}$ ·00006359

= 0.41

4 Alk to be added: $\begin{cases} 0.00006291 \\ 0.00004000 \end{cases}$

0.00002291

0.00013956

= 0.1641

4.5 $\frac{0.00006291}{0.00001265} : \frac{0.00005026}{0.00013956}$

$\frac{0.00006291}{0.00005026}$

= 0.36

pH 5.09 (6.)

$b_1 - 0.7342$

0.7590

5

0.00006291

0.000004

0.00005891

0.00005891

0.00013956

$= 0.422$

5.5

0.00006291

0.000001265

0.00006165

0.00006165

$.00013956$

$= 0.442$

10 c.c of $CuSO_4$ 1/10th requires — 3.50 c.c of hypo.

10 c.c of iodine " 5.55 c.c of hypo

10 c.c of ~~alkali~~ oxalic acid req. 6.2 c.c of alkali

10 c.c of Sulp. acid 9.4 c.c of alkali which neutralises 10 c.c of ox. acid with 8.9 c.c.

Acid & alk used for est. N_2 in yeast.

10 c.c ox. acid requires — 3.6 alk

10 c.c H_2SO_4 requires — 6.7 c.c of alk

Strength of alk : $\frac{10 \times N}{25 \times 3.6}$ N/9

$\therefore$ of acid $= \frac{10 \times 6.7}{25 \times 3.6 \times 10}$ N

Silhouette

Ethyl alcohol.

Date of seeding. 30.4.51.

Temp — 34°5C

Each culture contains

$CaCO_3$ — 0.2g

NaCl — 0.2g

K_2SO_4 — 0.2g

NaH_2PO_4 — 0.1752g

$MgCO_3$ — 0.25g

$(NH_4)_2SO_4$ — 3.75g

Ca OH — 18.5 c.c

Date of analysis — 29.8.51.

Temp — 32°8C.

Wt of R.D. bottle — 15.9178g

+ dist. water — 65.6500g

+ culture soln — ~~65.4~~ 65.4600g

Daily analysis. 29.8.51

Temp 32°8 C

pH 3

5 c.c. solution distilled in 100 c.c I_1

hypo 43.5 c.c

Drying 50 c.c I_2.

12.4 c.c hypo

I_1 — 0.7554 g

I_2 — 0.7980 g

Total acid. 10 c.c soln. against alk

7.1 / 15.8 } 8.7 c.c

Alcohol — ~~65.65~~ 65.66

V.M. (5~~6~~5.4) 0.4 c.c

Nitrogen 40 c.c soln in 200 c.c H_2SO_4

after Kjeldahling 3.7 / 49.3 } 45.6 + 2.9

11.4 / 14.3 } 2.9

48.5 c.c

yeast I_1 3.8192

I_2 0.8500

C in yeast.

0.02 g 25 c.c I_2

Thio — 8.9 c.c

N_2 in yeast. in 100 c.c and

0.5 g of yeast.

12.2 / 51.0 } 38.8 c.c

6.5 / 17.6 } 11.1

49.9

~~Alk~~

1396)2291 (1.641
1396
8950
8376
5740
5584
1560

1396)5026 (3.6
2792
2234
1396
8380
8376

1396)5891 (4.22
5584
3070
2792
2780

1396) 61645 (4.416
5584
5805
5584
2210
1398
8120
8376

1396)6250 (4.48
5584
6660
5584
10760
10868

1396) 6298.4 (4.5
5584
6944
6980

3.4978　　2_1 – 0.7530

0.4740　　2_2 – 0.7164

pH 3.5

J. Acid.

16.9 } 8 c.c
24.9

Alc.　65.6514

V. A.

V. A 50cc　12.6 } 0.4 c.c
13.0

C in soln

hypo　42.0 c.c

C after drying

14.4 c.c

C in Yeast

N_2　40 c.c in 200 c.c H_2SO_4

16.3 } 34.8
49.1　+　45.4 c.c
8.2 } 10.6
18.8

8.5 c.c hypo

N_2 of Yeast in 100 c.c acid

17.6 } 27.7 +
49.3

3.1 } 13.7
16.8

41.4 c.c

B10 — 10 c.c oxalic acid require 2.9 c.c of B10.

Strength of ~~bx acid~~ = $\frac{10 \times 2}{25 \times 2.9}$ = $\frac{1}{7.25}$

(margin: 5, 1.45)

10 c.c of oxalic acid contain — 0.0004 g of H+

12.9 c.c of soln at pH contains .0004

0.000000129 g

H+ neutralised = 0.0003998701 by 2.9 c.c

by 1 c.c = $\frac{.0003998701}{2.9}$

= .00013789

10 c.c of soln require 0.9 c.c alkali

So H+ — .000000109

.000124101

.000124210

10 c.c contain this much.

So 100 c.c = .0012421 gm of H+.

(Margin working:)

137886
29) 3998701
29
109
87
228
203
257
232
250
232
181
4 8

.00013789 × 9
.000124101

.124 × 20 … .1396

pH 4

T.A. 25.6 } 8.2
33.8

Ac. 65.6540

V.A. 0.3cc

5cc. Dr

Nitrogen

40cc in. 210cc H_2SO_4

5.1 } 44.9
50

+ 2.7 } 13.15
15.85

58.05

3 – 3.7552 3_1 – 0.7500

3_1 – 0.8754 3_2 – 0.7722

Carbon 5cc in 100cc I_2

41.2 c.c

After drying 50cc I_2
17c.c

C in yeast

Hypo 7.1

N_2 of yeast in 100cc acid

6.7

16.8 } 32.3
49.1
+
26.3 } 17.1
43.4

94 ← 94
49.4

2.8

13788

13893

27578

11570

11032

1230

0

.0004

.000126

.0003873

.00013788

·004 3.

√3.00

pH should contain

0.0012 421
0.0004 × 1000/490
0.00084 2

√4 + ·5441
·5
3.5

4.9254 alk = 0.0008421 / 0.00013789. 6.107 c.c
√4.1396
3.7858

·000

3.5
0.0012421
0.0004265 × 5/2
0.0011156

alk = ·0011156 / 0.00013789

√3.0476
√4.1396 .9080

0.0003163 = 8.091 ·0003163

√4 + ·5001

4
0.0012421
0.0000 4
0.0012021

alk = 0.0012021 / 0.00013789 3.4999

√3.0799
√4.1396
.9403

8.716

4.5
0.0012421
0.00001265
0.00122945

alk = 0.00122945 / 0.00013789

√3.0899
√4.1396
.9503

8.918

5
0.0012421
0.000004
0.0012381

alk = 0.0012381 / 0.00013789

√3.0927
√4.1396
.9531

8.976

√3.0937
√4.1396 5.5
.9541

0.0012421
0.000001265

8.996 0.00124083 / 0.00013789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(F4/59)

pH 4.5

~~3~~ ·2400 5_1 – 0.7174   ~~4_1 – 0.7550g~~

0.8306 5_2 – 0.7538   ~~4_2 – 0.73~~

9hrs in fr 5

J.A. – 2.4, 10.2) 7.8 c.c

Alcohol – 65.65

V.A. – 11.1, 11.3) 0.2 c.c

65.6 ~~5~~ 56 alcohol

(4) alcohol

V.A. – 0.3 cc

5cc – 8.2

J.A. –

C in soln 5 c.c in 100 c.c

39.2 c.c

after drying 5 c.c dil in 100 c.c I_2

~~17 c.c~~ 11.4 c.c hypo

C in yeast

Hypo 6.5 c.c

N_2 40 c.c in 200 c.c H_2SO_4

16.4, 50.0) + 33.6

+ 2.6, 13.8) 11.2

44.8

N_2 in yeast

~~3.5~~, 19.7) ~~16.2 c.c~~

12.6 c.c

25 / 8.9 / 16.1 — 15 / 15.2 / 9.8

10

		Alk. dil.	Water
3	hrs	6 + 1.1	2.75 + 17.3
11		.8 + .9	2.75 + 16.1
		8 + 7.2	2.75 + 9.8
		8 + 9.2	2.75 + 7.8
		8 + 9.8 (1.2 / 2.6)	2.75 + 7.2
		8 + 10.	2.75 + 7.

pH 5

I.A 11.2 8.2 c.c.
19.4

N_2 200 c.c Acid. alk
reqd 47.6 c.c.

Total acid - ~~7.8~~ 7.8 c.c alk

V.A - 0.2 c.c

~~Alcohol~~ - 65.6500.

3,8870 4_1 - 0.7550 g
0.8228 4_2 0.7384 g

C/ 100 c.c. I_2
44.5 c.c

After drying:
15.4 c.c

C in yeast
Hypo 5.7 c.c

N_2 in yeast (500 c.c au

~~20~~ 12.6 c.c
34.6
16.2 c.c

0.0004

pH 3

29) 399871 (13785
29
109
87
228
203

Strength of B_{10}

10 c.c of ox. acid soln requires — 2.9 c.c of B_{10}.

8.17 0.7 c.c 7.41 ∴ 1 c.c soln requires — 0.7 c.c B_{10}

∴ 10 c.c of ox. acid soln contains — 0.0004

p.45 — 12.9 c.c .0004
0.000000129

.000399871

neutra. by 2.9 =
by 1 c.c 0.000399871 / 2.9

= 0.000137889 c.c

137 85

257
232
25 14
14.5

10 c.c soln = 0.000 000 107

0.000137889 × 7
.000096523

0.000096523

0.000096630

2.4
14.6
17.0
14.6
31.6
14.6
46.2

pH 5.5

T.A. 22.2
28.4 } 6.2 c.c

3.5760
0.8274.

b_1 — 0.7372 g
b_2 — 0.7590 g

C in soln
44.4 c.c

After drying (50 c.c I_2)
16.4 c.c ~~45.4 c.c~~

Distill 65.6560 g.
50 c.c V.A. → 0.1 c.c.

N/ 200 c.c acid, alk
- reqd 58.9 c.c

132.6
20.5
112.1

C in yeast
hypo 5.1 c.c

N_2 in yeast
20.9
35.6 } 14.7

22.6
14.6
42.2

130
112.1
17.9

225
16 15

∴ 200 c.c soln = 0.0000 9663 × 25
0.00241575

To be neutralised = 0.00241575
0.00040000
.00201575

alk to be added = 0. ~~00~~ 201575
0. ~~000~~ 13789

Ralinder's 25 c.c acid = 25 x 12.75 = 31.875 c.c.

I compound. 31.875 − 31.8 = 0.075

II comp 31.875 −
27.900
3.975 c.c. alk used

N_2 present = $\frac{3.975}{1000} \times \frac{14}{7.25} \times 0.2$

= 0.3837 g in 1 g.

14.6

13789) 20157.5
13789
63685
55156
85290
82734
2556

14.6 c.c alk to be added.

Alk	Water
14.6	130.4
2.8	
17.4	132.6 c.

13.6
14.6
28.2
14.6
42.8

0.5993
1.1461
1.7454
1.1614
0.5840

3.8603
4.3010
1.1614

130
20.45
109.55

150
17.4
132.6

5412

150
20

Dilution
250.

(alk)

Acid H_2SO_4 used for estimating N_2 in soln is same as used for alcohol (det. N_2 in yeast)

Alk same for Total acid.

same for Vol. acid.

250
130
380
17.4
397.4
379.5
17.9

40
20.5
379.5

592.4
325
92.4

Glucose cultures

Date of seeding — 7.5.51

Temp^{re} — 35°.5

The cultures contain

$CaCO_3$ — 0.2g

NaCl — 0.2g

K_2SO_4 — 0.2g

$MgCO_3$ — 0.1952g

Na_2HPO_4 → 0.25g

$(NH_4)_2SO_4$ — ~~Or~~ 3.95g

Glucose — 20.96g.

Date of analysis 14th Sept '51

Temp^{re} — 33°.C

Wt. of weighing bottle — 16.3326

~~15.9178~~

+ dist water ~~15.6438~~

Wt I compared with — 66.0942g

others " " ~~66.0914~~

66.0952g

pH 3

Filter paper I — 1·3540 3·6300 g

I, — 1·3542. 1·4090 g

Total N$_2$ 40 c.c dil in

105 c.c N_2SO_4.

Alk — 23.9 c.c

Red. Sugar.

-0-

Carbon in soln

5 c.c in 25 c.c Iodine.

hypo — 6·2 c.c

Total acid 10 c.c soln against alk.

3·8
7·75 > 3·95

Alcohol — 66·0 & 42

~~Total~~ ~~Sugar~~.

Vol. acid. 3·2 > ·25
3·25

C in year.

0·02 g distilled in
25 c.c. of Iodine soln.
6·8 c.c. of hypo needed.

N in year.

0·5 g distilled in 50 c.c. of dil $\frac{1}{2}$ H_2SO_4.
15·8 c.c. of alkali as 6
was required in the end.

0.63 —

63 — 1l — N

.63 — 1l — $\frac{N}{100}$

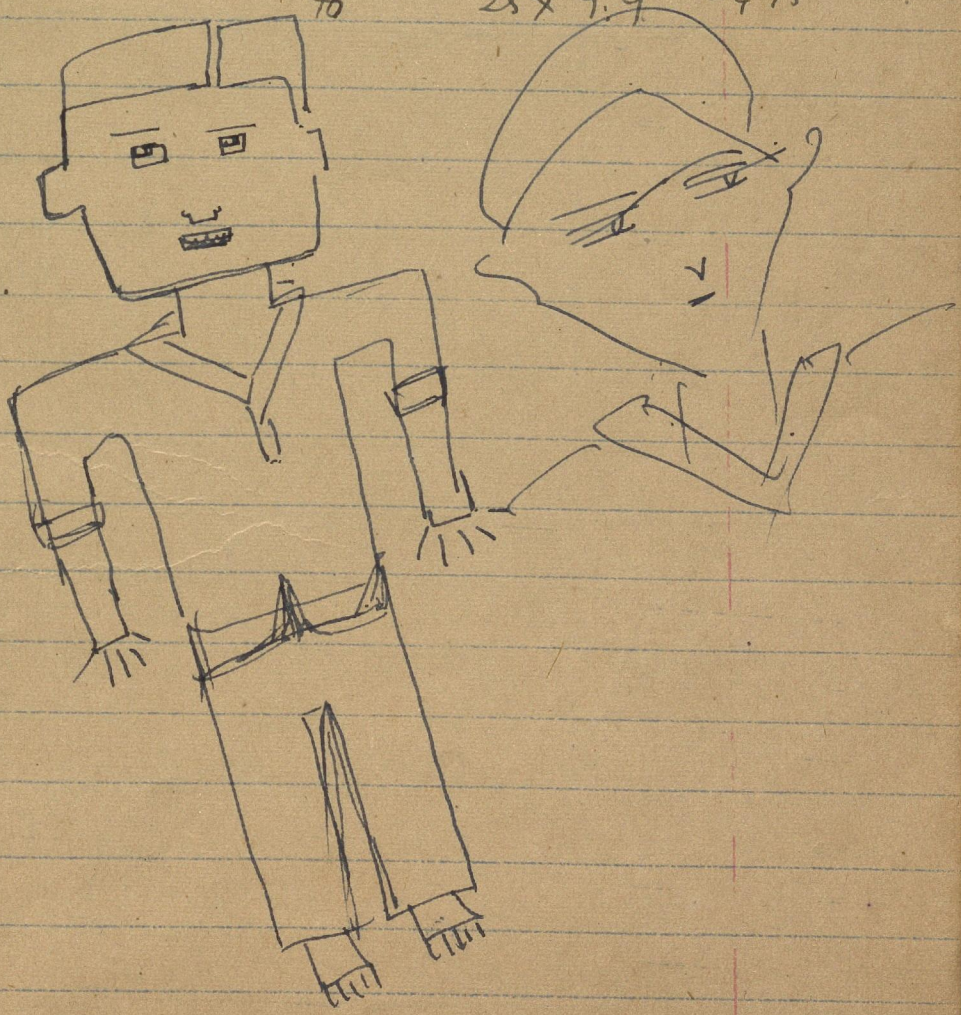
250 — $\frac{N}{25}$

$\frac{25 \times 9.9}{225}$

$\frac{225}{247.5}$

$\frac{10 \times N}{25} = 9.9 \times x$

$x = \frac{9.9 \times 25}{10}$ $\frac{10}{25 \times 9.9}$ $\frac{N}{24.75}$



pH 3.5

2 — 1.2800 3.9600 g

2_1 — 1.3358 1.3986 g

Total nitrogen
40 c.c in 1 w c.c acid
23.4 c.c alk.

T. Acid 8.05 12.7 > 4.65
27.9 32.55 > 4.65

R.S. — 0 —

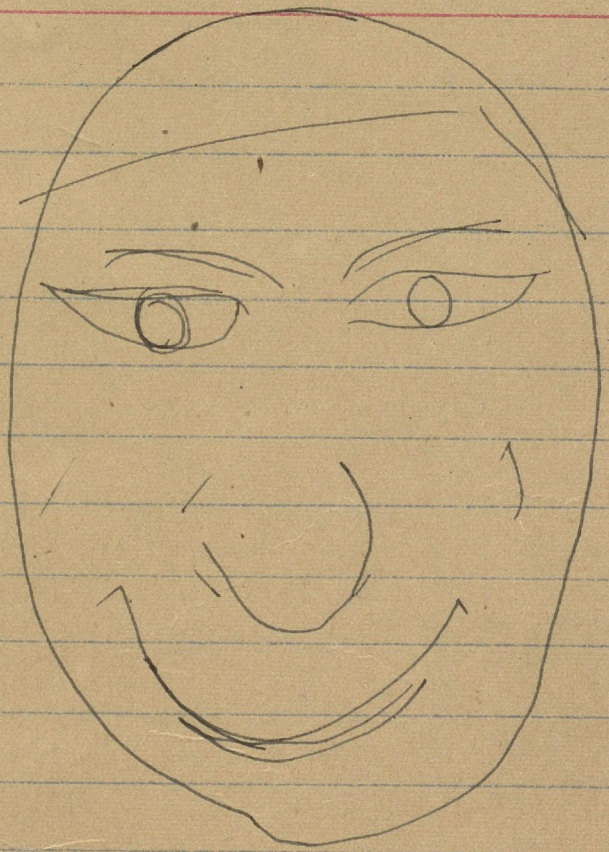
Mc. 66.0955

V.A. 4.4 4.7 > .3

Cl
6.2 c.c

C in yeast 0.02 g.
digested in 25 c.c.
6.4 c.c. of hypo needed
in the end.

N in yeast.
0.5 g of yeast digested in
50 c.c. of conc. H_2SO_4 after digestion
14.6 c.c. of alkali no 6
were required.



that's all right

pH 4

3 — 1.3612 3.4280

3, — 1.1718 1.3200

Total N_2

40 c.c soln in 100 c.c acid.

Alk — 19.5 c.c

T.A. 13.1 / 16.4 — 3.3 c.c

Alc. 66.0955

V.A. 0.2 c.c alk

R.S.

C/ 4.2 c.c

N in yeast ?

C in yeast 0.02 g.

distilled in 25 c.c. of iodine

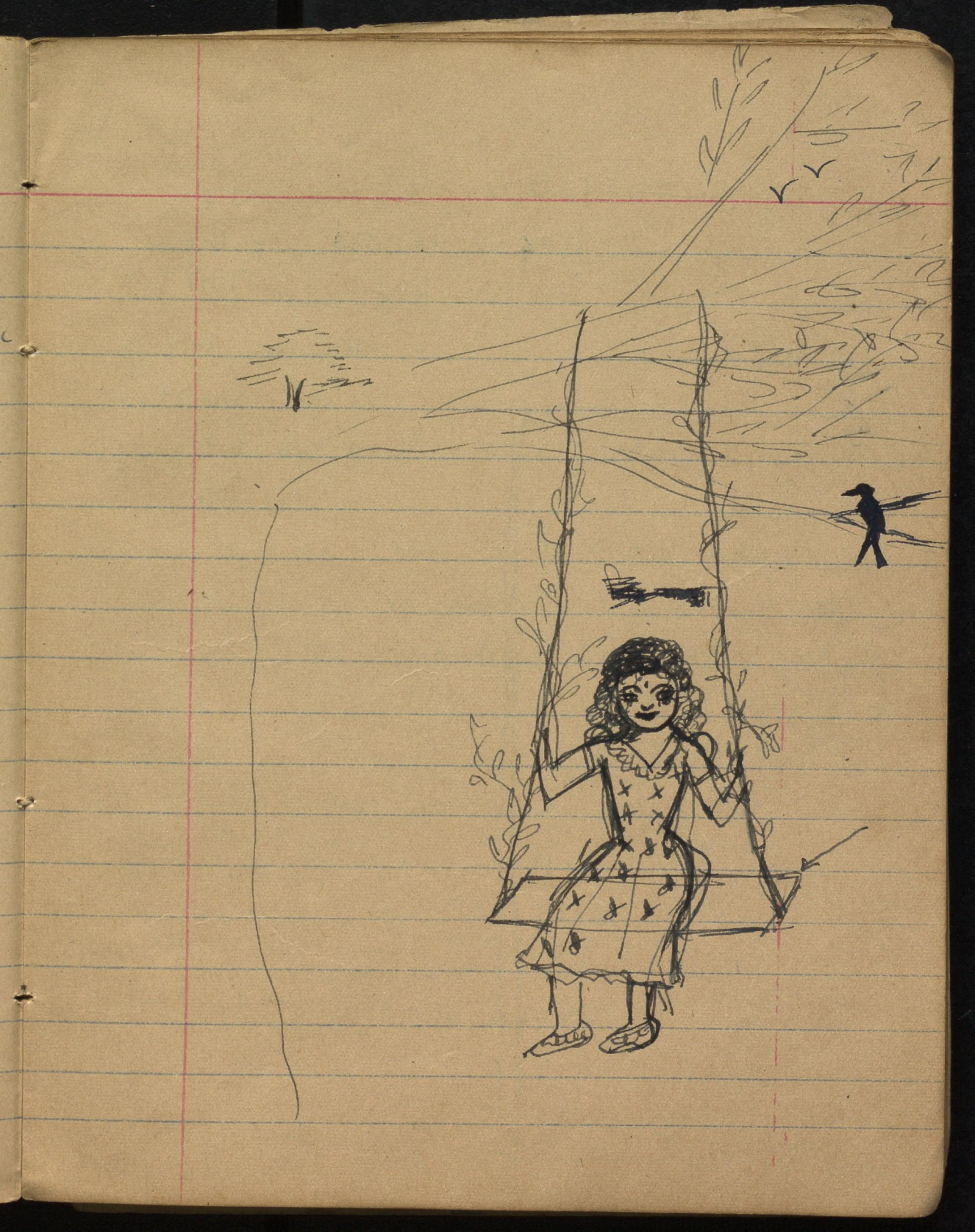
in the end 6.3 c.c. of hypo

was needed

N in yeast

0.5 gr distilled in 50 c.c. of dil H_2SO_4 no. 6.

In the end it reqd 14.0 c.c. of alkali no 6.



pH 4.5

4 —	1. 36 28	3.4384	J.A
4_1 —	1. 3~~4~~00	1. 5030	16.6
			19.9 } 3.3 c.c

Cu sdn 4 c.c

Total N 14.7 c.c

Alc. 66.0940

V.A. 6.95 } 0.25
7.2

$CaCO_3$ — 2g
K_2SO_4 — 2g
NaCl — 2g
NaH_2PO_4 — 1.752
$MgCO_3$ — 2.5
$(NH_4)_2SO_4$ — 2.5

Cu in yeast
0.02 g diluted in 25 c.c.
hypo with the end 6.3 c.c. of
hypo needed

N in yeast 0.5 g distilled in
50 c.c. of alkali no 7.
alkali — needed in no 6.
⟶ 41.6 c.c.

Strength of acid no 7
10 c.c. needs acid
— 11.3 c.c. of
alkali no 6.

X

B_{12}. 10 c.c of ox. acid (0.63g in 250 c.c) require 5.75 c.c B_{12}

I 10 c.c soln require ~~3.2 c.c~~ of B_{12}.

II 5.1 c.c of B_{12}.

∴ 10 c.c of oxalic acid contain 0.0004 g of H^+

15.75 c.c soln at pH 5 will contain

0.0000001575 g H^+.

∴ H^+ neutralised : 0.0004

0.0000001575

0.0003998425

∴ 1 c.c can neutralise. $\frac{0.0003998425}{5.75}$

0.0000 6953

6019
1597
8422

10 c.c of soln require 5.1 cc alk.

H^+ present in 10 c.c. 0.00000151 0.00000151

~~0.00055000~~ 0.00035400

~~0.00055151~~ 0.00035551

8422
2076
5498

pH 5

5 —	1.3158	3.5520	T.A.
S_1	1.3438	1.3920 g	20.2
			23.7 } 3.5 c.c

Cu in soln 4 c.c

Total N_2. 20 c.c

A. 66.0940

V.A 8.1
8.35 } 0.25

Cu in yeast
0.02 g distilled in 25 c.c.
iodine soln..
6.0 c.c of hypo needed in
the end.

N in yeast 0.5 g in 50 c.c.
dil H_2SO_4 — after distillation
41.6 c.c. of [illegible] alkali not
is needed.

So in 100 c.c = 0.005502 g.

pH 3 To be present: 0.0004

∴ To be neutralised: 0.005502
.000400
0.005102

Alkali to be added. = 0.005102
0.00006953.

= 73.38 c.c.

(3.7078
(5.8422
1.8656

B12.
73.4 c.c

pH 3.5 0.005502
0.0001265
0.0053755

0.005376
0.00006953
= 76.43

(3.7305
(5.8422
1.8883

76.4 c.c

4 0.005502

pH 5.5

6 — 1.1200 2.9670g T.A.

6, — 1.3038 1.3880g 24.1 } 3.1cc
27.2

C in KMnO 3.9c.c

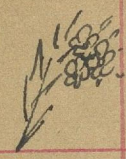
Total N_2 110c.c acid
24.4c.c alk

Alc. — 66.1000

V.A — 0.35 c.c alk

C in yeast
0.02g distilled in 25c.c. of iodine.
in the end 6.0c.c. of hypo was needed.

N in yeast 0.5g.
distilled in 50c.c. $N/_{?}H_2SO_4$
7; after distillation 40.7c.c. of alkali was needed.



50 in 100 c.c = 0.003549.

pH 3

0.003549 − 0.000400 = 0.003149

0.003149 / 0.00006953 = 45.28.

3.4981
5.8422
1.6559

B_{12} 45.3 c.c

• pH 3.5

0.003549 − 0.0001265 = 0.0034225

0.003423 / 0.00006953 = 49.22

3.5341
5.8422
1.6922

B_{12} = 49.2.

pH 4

0.003549 − 0.000040 = 0.003509

0.003509 / 0.00006953 = 50.47

3.5452
5.8422
1.7030

B_{12} 50.47

pH 4.5

0.003549 − 0.0001265 = 0.00353635

0.003536 / 0.00006953 = 50.85

3.5485
5.8422
1.7063

Standardising alkali no 6.

10 c.c. of oxalic acid. contg 0.63 g oxalic a in 250 c.c. reqrs alkali no 6 3.6 c.c.

~~[illegible]~~

Acid no 6

Acid dil H_2SO_4 ~~[illegible]~~ 6.7 c.c of alkali
no. 6 no 6.

Standardisation of acid dil H_2SO_4 no 7.

alkali no 6.

10 c.c. Acid ← 11.3 c.c

22/9/51

Standardisation of alkali 7.

10 c.c. of ~~oxalic acid~~ →
0.63 g of oxalic acid
250 c.c. → 3.5 c.c of
alkali no 7.

Sucrose cultures.

Date of seeding: 17th. May '51

Temp: 36°c.

Each culture Contains:

$CaCO_3$ – 0.2g

$MgCO_3$ – 0.25g

NaCl – 0.2g

K_2SO_4 – 0.2g

NaH_2PO_4 – 0.1752g

$(NH_4)_2SO_4$ – 3.75g

Sucrose – 20g.

Total volume — 400c.c.

Wt of R.D. Bottles = 16.3326

Weight of the distilled water + R.D. bottles = 66.0 g.

Date of analysis – 20th Sept '51
Temp – 32·5

pH 3

1 – 1·4352 g | 1 – 1·3542 g
after weighing
1 – 4·6690 g
1, – 1·4600 g.

T.A. Alkali no. 6.
5 c.c. → 2·5 c.c.

Cu in culture after fermentation.
50 c.c. iodine
5 c.c. → hypo needed – 9·3 c.c.

Total Nitrogen

Alk. no. 6: 69·15 c.c
(Acid no: 7 (100 c.c. used))

Alcohol [illegible]

Distillate = 66·5035

Alk. 7 50 c.c. – 0·5 c.c.

R.S.
N.R.S. } no sugar

N in yeast / yeast

0·5 g of yeast was distilled in 50 c.c. of (acid) dil H2SO4 no 7.
afterwards 40·1 c.c of alkali no 7 is needed.

C in 0·02 g

25 c.c. [illegible] of solution.
after distillation 6·6 c.c of hypo.

23.1580
31.9616
55.1196

pH 5 0·003549 0·003545

0·000006 4 0·00006953

0·003545 = 50·98 c.c.

3·5496
5·8422
1·7074

B12 5% c 50·98 c.c

pH 5·5 0·003549 0·003548

0·000001265 0·0000 6953

0·00354773 5 = 51·02.

2·00
3·5500
5·8422
1·7078

Sugar 20g EtOH = 20·45 c.c. Glucose = 23·158 g

100 c.c soln in each.

	Alk.	dil. Alk.	Water.	Water for Alchl. 200+	
1.	45·2	0·8	200+54.	− 33·6	8·1
2	49·2	nil.	200 + 50·8	30·4	5
3	50·4	0·7	" + 48·9	28·5	3·5
4	50·85	nil	" + 49·2	28·8	3·8
5	50·9	0·8	" + 48·3	27·9	2·9
6.	51	0·2	" + 48·8 c.c	28·4	3·4

pH 3.5

2 — 1.3022 g 2, - 1.2420 g

C in the culture.
~~T.A.~~ iodine 50c.c.
5c.c. → 16.2 c.c.

T.A.
12.2
14.2 → 2c.c.

~~C in the culture left~~

∴ ~~5c.c.~~ —
After weighing
2 — 3.8970 g.
2, — 1.4600 g.

N left in the culture.
40c.c. dried.
distilled in 100c.c. dil H_2SO_4 no 7
titrated with alkali no. 6
68.5c.c. of this alkali needed

V of R. B. & C —

+ water = 66.5235 R.S.
N.R.S. } no sugar.
Alcohol = ~~66.5335 gr~~ 66.5135 g

V.A.
50c.c.

Alkali 7.
0.4 c.c.

N in yeast
0.5 g of yeast dissolved in 50c.c. of acid no 7.
40.1 c.c. of alkali no 7 is needed

C in yeast.
0.02 g. dissolved in 25 c.c. of iodine solution
5.6 c.c. of hypo needed in

~~The~~ ~~end~~.

300	100	100	100	100	
46	51.1	50.85	51.7	51.2	
254	48.9	49.15	48.3	48.8	
5400	50.80	48.90	49.20	48.30	48.80
20.45	20.45	20.45	20.45	20.45	20.45
33.55	30.35	28.45	28.75	27.85	28.35

All cultures containing (EtOH fructose glucose)
0.25g of $(NH_4)_2SO_4$
seeded on - 19-4-52
Temp 35°C

pH 4

3 - 1·3224 g   3, - 1·3670

T.A.   Alkali no 6   Clotting the cells.
5 c.c. — 1·95 c.c.   5 c.c. distilled in 50 c.c. iod.
After washing   16·0 ~~[illegible]~~ c.c. hypo.
3 3·7960 g
3, 1·4420 g.

N in culture.
40 c.c. dried.
distilled in 100 c.c. of dil H_2SO_4 no 7

after distillation it took 64·8 c.c. of alkali no 7.

Distilling Alcohol = ~~66·8585 g~~ = 66·4800 g
U.A.

50 c.c. — Alkali no 7
0·4 c.c.

So sugar reducing or non reducing.

N in yeast.
0·5 g in 50 c.c. dil acid no 7.
after distillation ~~[illegible]~~ 39·0 c.c. of alkali no 7 is needed.

Cu in yeast.
0·02 g in 25 c.c. of [illegible].
afterwards 5·4 c.c. of hypo is needed.

I,	1.4748	I –	5.0766
II,	1.5252	II –	2.0162
III,	1.3430	III –	2.5323
IV,	1.3048	IV	1.4834
V,	1.4778	V –	3.1246
VI,	1.5250	VI –	2.3015

pH 4.5

4 – 1·3442 g

T.A. Alkali 6.
5 c.c. → 2·2

4, – 1·3542 g.

After weighing:
4 – 4·3564 g.
4, – 1·5072 g.

T.C. left.
5 c.c. in 50 c.c. iodine
after distillation required 15·9 c.c. of hypo.

N left.
40 c.c. distilled in 50 c.c. dil ½ Sn no 7.
after distillation 13·1 c.c. of alkali no 7 is needed

Distilled ade = 56·4740 g.
50 c.c. – 0·3 g.

No sugar reducing or non-reducing.

N in yeast:
0·5 g. in 50 c.c. dil ½ Sn no 7
38·1 c.c. of alkali no 7 is required in the end.

P in yeast.
0·02 g in 25 c.c. solution.
after titration 5·0 c.c. of hypo is needed

pH 5

5 - 1·3800 g 5_1 - 1·3420 g

T.A. alkali no 6.   After weighing
5 c.c. 2·25 c.c.   5 - 4·3650 g.
                          5_1 - 1·3500 g.

T.C left.
5 c.c. in 50 c.c. iodine.
after titration
required 12 c.c. hypo

Distillate - 66·4800 g.
50 c.c. V.A - 0·6 c.c. alkali no 7.

N in yeast.
0·5 gm in 50 c.c. dil H_2SO_4 no 7
afterwards, 40·2 c.c. of dil alkali no 7

C in yeast.
0·02 g of yeast in 25 c.c. of iodine.
afterwards 4·9 c.c. hypo. was needed

~~contain in culture.~~

nitrogen left in culture

40 c.c distillate in 50 c.c. (A7)
(B7) - 12·3 c.c.

pH 5.5

6 — 1·4110 g

6₁ - 1·4100 g

Aft. weighing.

6 - 3·6886 g

6₁ - 1·4374 g.

T.A. alkali 6 n.

5 c.c → 2·3 c.c.

C left.

5 c.c in 50 c.c. iodine.

hypo - 10·6 c.c

No reducing or non-reducing sugar left.

R.D. Bottle + distilled = 66·4800 g.

V.A. 50 c.c → 0·3 c.c. of alkali n/7.

N in yeast

0·5 gm N in yeast.

dissolved in 50 c.c of dil H_2SO_4.

afterwards it required 40·8 c.c. alkali n/7.

C in yeast.

0·2 g of C in yeast.

dissolved in 25 c.c. of iodine solution.

afterwards 5·2 c.c. of hypo was needed.

N in yeast culture.

40 c.c of the culture was dissolved in 50 c.c. of Acid (n/7)

Alkali n/7 — 11·5 c.c. were needed.

10 c.c of oxalic acid requires 2.9 c.c of alk.

Soln. I 3.3 / 4.05 > 0.75 II 19.8 / 20.6 > 0.8 c.c

~~July '51.~~ ~~5 gms of Amm. Sulphate in a litre~~

~~250 c.c taken in each culture.~~

1st period - 9th Class

2nd period - II year. { Th / ~~Ex~~ / Sa.

3rd period - ~~Ist~~ I year

4th period - 10th Class.

For

$CaCO_3$ —

Glucon cultures seeded on 25.8.51 & they started growing on 28.8.51.

29.8.51 Alcohol cultures seeded on 13.8.51 with pH 3, yeast started growing from very next day and the other cultures after 4 to 5 days excepting 5.5 which took a ~~little~~ day or two more. (pH 3.5) was seeded again.

R S Rangam Rangam Rangam Rangam
Rangam S Rangam Rangam Rangam
Ra R R R

12.5.51 The alcohol cultures which were seeded on the 30.4.51 were examined to-day. The cultures at pH 3, 3.5 and 4 showed the scum formation after 12 days. The cultures at pH 4.5, 5 and 5.5 did not show any appreciable growth even up to 15th. There was slight indication of cell division and small colony fermentation in culture at pH 4.5 and 5 but that at pH 5.5 was quite dormant.

Str of alk 11 c.c of x acid requires 3.5 c.c

Streng of Acid - 10 c.c of acid ≡ ~~10.85 c.c~~ alk
11 c.c alk.

of Thio

of Iodine

.63 - ~~1000~~ N/100
250 ~~N/25~~

strength of x acid =

$\frac{2\cdot0 \times N}{3.5 \quad 25}$ = $\frac{2N}{17.5}$ = $\frac{N}{8.75}$

23
35.46
~~58.46~~

Rangam

58.5 - 23
32 - $\frac{23 \times 2}{58.5}$

1.81
58.5) 1060
585
4750
4680
700
585

46
12
48
~~96~~
106 - $\frac{23 \times 2}{58.5}$ =

$\frac{~~58.5~~ + ~~23 \times 2~~ \times 106}{58.5 \times ~~46~~}$

July '51 Sucrose Cultures

July.

How?

बताइये

The amount of amm. sulphate in culture is ~~[illegible]~~ 1.25 gms.

Each culture contains

NaCl –	0.2 g	2g
K_2SO_4 –	0.2 g	2g
$CaCO_3$ –	0.2 g	2g
$MgCO_3$ –	0.25 g	2.5 g
NaH_2PO_4 –	0.1752 g.	1.752g
$(NH_4)_2SO_4$ –	1.25 g.	[2.5 g]
Sugar –	20 g.	

6

Date of seeding – 10.8.51

Temp. – 32°.5 C

Aug 22

Sept. 30

Date of analysis: 1st Oct '51

Temp: 31°.6 C.

Wt. of R.D. bottle – 16.3326 g

+ dist. water – 66.1226

Str of alk 10 c.c of ox. acid requires 3.5 c.c
Streng of Acid — 10 c.c of acid = ~~10.85 c.c~~ alk
11 c.c alk.
of Thio
of Iodine

$\cdot 63 - \cancel{1000}\ \frac{N}{100}$

$250\ \cancel{\frac{N}{25}}$

strength of ox acid =

$$\frac{2 \times 10}{3.5} \times \frac{N}{35} = \frac{2N}{17.5} = \frac{N}{8.75}$$

23
35.46
~~58.46~~

Rangam

58.5 — 23
32 — $\frac{23 \times 2}{58.5}$

1.81
58.5) 1060
585
4750
4680
700
585

46
12
48
~~96~~ 106 — 46 — $\frac{23 \times 2}{58.5}$ =

$\frac{58.5 + 23 \times 2 \times 106}{58.5 \times 46}$

July '51 Sucrose Cultures

July.

Kolli?

बताइये

The amount of amm. sulphate in culture is ~~1.25~~ 1.25 gms.

Each culture contains

NaCl –	0.2 g	2g
K_2SO_4 –	0.2g	2g
$CaCO_3$ –	0.2g	2g
$MgCO_3$ –	0.25g	2.5g
NaH_2PO_4 –	0.1752g.	1.752g
$(NH_4)_2SO_4$ –	1.25g.	[2.5g]
Sugar –	20g.	

Date of seeding – 10.8.51

Temp. – 32°.5 C

Aug 22

Sept. 30

Date of analysis: 1st Oct '51

Temp: 31°.6 C.

Wt. of R.D. bottle – 16.3326 g

+ dist. water – 66.1226

1— 1.1378

1/4— 1.1278

J.A. 6.6 → 4.35 c.c
10.95

Alcohol 66 · 1160

V.A. 6.0 → 0.3 c.c
6/3

20 c.c dil
1/10 R.S. 3.45 → 22.25
25.8

T.S. 3.6 →
25.8

27.3

चमन में

Cin Arthur.

5 c.c dist in 50 c.c $\frac{1}{2}$:

Ranjan.

A thing of beauty is a
joy for ever
Its loveliness increases;
it never fades into
nothingness.

न जाने क्यूँ बदलती जा रही
ज़िन्दगी मेरी

2 – 1.1774 Coin Culture

2_1 — 1.1800

T.A. 11.5 > 4.3
15.8

Alcohol: 6 0980

V.A. 8.9 > 0.6 cc
9.5

3

No sugar.

3 — 1.1678.

3_1 — 1.1637.

J.A. — 18.4
22.7 } 4.3

Mc. — 66.0700

V.A. — 14.1
14.75 } 0.65

. SOcc soln diluted to 100.

R.S. 3.3
48 } 4
13.4
50

40cc used.

4 — 1.1108

41 — 1.1352

I.A. 23.2 / 27.65 > 4.45

Mc. 66.1150

Q.A. 16.2 / 17.2 > 1.0 c.c

f — 1.2334

f_1 — 1.2008

I.A. 28.1 } 3.1 c.c
31.2

Al. 66.0866

V.A. 18.15 } 0.55
18.7

b — 1.2009

b_1 — 1.2590

JA. 31.45 > 2.65 c.c
34.1

Al. 66.0826

V.A. 19.55 > 0.45
20.00

342

46 —

23 24 5

~~46~~ × ~~144~~ × ~~20~~

6 ~~24~~ × ~~342~~ · 171

120 × 23

2760

16.14

171) 2760

171

1050

1026

240

171

690

684

6

16.14 g.

1.2079

1.8973

1.3106

$\frac{16.14}{.7894} = 20.45 c.c$

Anju

31.9641
23.1580
55.1221

Aug. '51. Ethyl alcohol cultures

C$_2$H$_5$OH — ~~18.5 c.c~~

$CaCO_3$ —

$MgCO_3$.

K_2SO_4

Na_2HPO_4

Nacl

$(NH_4)_2SO_4$ — 1.25g

T. volume — 400 c.c

Date of seeding — 13-8-51

Temp —

C_2H_5OH

24
6
16
46

I — 1·1960

I_1 — 1·2694

144
22
176
342

$C_{12}H_{22}O_{11}$

20·45
8·76
29·21
50·00
20·79

144
22
176
342

342 — 144

20 — $\frac{144 \times 20}{342}$

20·45
8·74
29·19

20·45
36·27
56·72
150·00
93·28

144
22
176
342 — $\frac{144 \times 20}{342}$

55·36
20·45 20·81
55·81
150
94·19

19·96
21·05
20·96

$\frac{\cdot 09 \times 100}{20{\cdot}96}$ 9000 (·4 %

16 3
6
96

$C_6H_{12}O_6$.

$\frac{144 \times 20}{342}$ C.

20·45
8·68
29·13
50·00
20·87

12
96
72
180

2
$\frac{144 \times 20}{342 \times 72}$ × 180 / 16

90
40
360
360
3960

72

171) 3960 (23
342
540
513
170

18

B42
18
360

180
144
324
18
342
18
36 0

20.96

II —

$C_{12}H_{22}O_{11} \cdot H_2O$

360 — 144

$\frac{144 \times 20 \times 360}{342 \times 360}$ — $\frac{144 \times 20}{342}$

342) 7200 (21.052
684
360
342
1800
1710
900
684

72
12
96
18
198

$C_6H_{12}O_6 \cdot H_2O$ — 198 — 72

$\frac{144 \times 40 \times 198}{342 \times 72}$ $\frac{144 \times 20}{342}$

342) 7920 (23.158
684
1080
1026
540
342
1980
1710
2700
2736

=

$\frac{198 \times 2 \times 20}{}$

20.65
33.4
53.85
150
96.15

72
12
96
18
198

180 — 72

$\frac{144 \times 20}{342}$

$\frac{144 \times 20 \times 180}{342 \times 72}$ =

7200

October '5!

To Study of the effect of ~~uv~~ visible light on the cultures of Dhar yeast containing sucrose, maltose, glucose, galactose and ethyl alcohol separately as C sour and Amm Sulphate as source of N_2 at pH 3, 3.5, 4, 4.5, 5, 5.5 under non. aerated conditions.

Sucrose — 20g

glucose — ~~10.95g~~ 23.158.

Ethyl alcohol — ~~18.5 c.c~~ 16.14g ie 20.45 c.c.

Maltose — 21.0526

galactose — 23.158

For pH 3

The amount of substances to be weighed to make a litre of the culture solution:

1. NaCl — 0.8 g
2. K_2SO_4 — 0.8 g
3. $MgCO_3$ — 1 g
4. $CaCO_3$ — 0.8 g
5. NaH_2PO_4 — 0.7008 g
6. $(NH_4)_2SO_4$ — 1.0 g

Three litres of solution are to be prepared

Alc to be added — 20.8 c.c

Solution to be taken — 250 c.c

∴ Dist water = 129.2.

except for alcohol culture in which water to be added is 108.45 c.c

Seeded on. 30th Oct '51

Temp. 31°.9 C

31.9641
1.515
33.4791

Each Culture Contains.

$CaCO_3$ — 0.2g

K_2SO_4 — 0.2g

NaCl — 0.2g

NaH_2PO_4 — 0.1752

$MgCO_3$ — 0.25

$(NH_4)_2SO_4$ — 2.5.

Sugars eqt amounts

Total volume

400 c.c.

The pH of the cultures kept at 3.

The Cultures seeded on 30.10.51

Temp 31.9 C

Alcohol yeast	yeast.	Ash.	Ash in 1gm of yeast.	% yield.
1	0.2027	0.0042	(0.0207) .0175	28.39
2	0.220	0.0040 ✓	0.0181	28.16
3	~~0.2809 0.2672~~ 0.2809	0.0053 ✓	0.0188	28.17
4	~~0.2555~~ .2672	0.0052	0.0198	28.55
5	0.1719	0.0021	0.0122	31.68
6.	0.1396	0.0020.	(0.0144) .0064	27.10.

2.5 g $(NH_4)_2SO_4$ Equ quantity of $(NH_4)NO_3$ is 1.515 27 28 29 30.

The ~~6.0800~~ 6.06 gm.

Alcohol cultures seeded on. Tuesday 27th Nov 57

Determn of ash. Content:

Temp. 26°C

Alcohol Cultures

	C	C+Y	C+Y+Ash
✓ I	22.1000	22.3027	~~22~~.1042.
✓ II	19.5188	19.7388	19.5228
III	19.8947	20.1756	19.9000.
IV	22.1028	22.3583	22.1080
V	19.5228	19.7900	19.5281
VI	19.9000.	20.0719	19.9021
Sept I	22.1080	22.4474	~~22.1074~~ 22.11008
II	19.5281	19.7811	19.5298
III	19.9021	20.1047	~~19.6880~~ 19.9042
IV	22.1100	22.1330	22.1104
V	19.5298	19.6880	~~19.5304~~ 19.5312
VI	19.9042	20.0704	19.9044.

20.8800 — 21.0539 20.8830

oct ~~1. 22.1104 — 22.2257~~ —

2. 19.5312 — 19.7394 — ~~21~~ 34 19.5324

3. 19.9044 — 20.0257 — 19.9062

4 20.8830 — 21.0534 20.8878

5 19.5324 — 19.6918 19.5350 —

6. 19.9062 — 20.0336 — 19.9092

10.5 × .00001 / 10

Dr. ~~DR~~ Jekyll & Mr Hyde by R. L. Stevenson

Amm. nitrate cultures:

1c.c of alk 9 neutralises 0.00013956 g of H^+

I 10c.c requires — 8.2 → 8.7 → 0.5

II 10c.c " — 6.7 → 7.85 = 1.15.

I 0.5 c.c has neutralised

10c.c soln contains = 0.00006978

= 0.000000105

0.00006988 5

.0000 69885 x 25

.001747125

∴ 250c.c contain = 0.001747125

II 1.15 c.c has neutralised

0.000160494

0.000000115

0.000160606

.00016061 x 25

.00401525

250 c.c contain — 0.0040153

8. 9

ठीक

✓ pH3	25.9	+ 200 c.c	+ 100	+ 24.1
			"	+ 22.1
3.5	27.9	+ "		+
	28.5	"	+ 100	+ 21.5
✓ 12 + 4.3	12.43	"	+ 100	+ 33.7
12 + 5	12.5	"	+ 100	+ 33
12 + 5.1	12.51	"	+ 100	+ 32.1

34 / 1.8

18.89

18) 340
18
160
144
16

Zero

27.7
12
31.7

I 3.6 } 10 c.c requires
5.1 } 1.45 c.c. of alk. 9.
6.5

II 6.5
6.85 } 0.35 c.c

1 c.c of alk 9 neutralises 0.00013956 g

I 1.45 c.c has neutralised.

0.00013956 × 1.45 = 0.000202362

69780
55824
13956
.000202362 0

0.0000001145
0.00020248

6 120
.00020248 × 25
.00506200

In 250 c.c = 0.005062.

II 0.35 c.c has neutralised

0.00013956 × 0.35

69780
41868
.0000488460

225
12
2237

0.0000048846
0.0000001035
0.00004895

.00004895 × 25
.00122375

250 c.c 00.00122375

C2OH. AnSdn Water

I 250 + 1000 + 20.45 + 33.6 + 96.15

+ 851 1.15

250 20.45 + 35.36 + 94.19

250 4.19

250 20.45 + 36.27 93.28

3.3.

250 20.45 + 8.68 20.82 + 100

.82

250 20.45 + 8.74 20.81 + 100

.81

250 20.45 + 8.76 20.79 + 100

.79

Annemalai Nagar.

Blk

3.4

K.B

I

2.8
15.4 } 12.6

0.36 (·06)

(18) II

3.5
29.3 } 25.8 c.c

~~1.29~~ 1.27 (·07)

K

3.68 (·08)

3.74 (·06)

3.46 (·06)

DRY C

As if I care two pins about it.

Glucose Cultures

Sol I		Acid.	water
3	10 c.c	2.2 c.c	300 + 80 + 7.8
3.5	10 c.c	·4 c.c	300 + 80 + 9.6
Not being taken.		Old	
4	10 c.c	1.65 c.c	300 + 80 + 8.35
4.5	10 c.c	3.6 c.c	300 + 80 + 6.4
5	10 c.c	4.2 c.c	300 + 80 + 5.8
5.5	10 c.c	4.4 c.c	300 + 80 + 5.6.

23.158
31.9641
55.1221

31.9641
1.5150
33.4791

pH	Gl. Cultures Soln.	dil$^{9}_{10}$ titres Alk.	water
3	100	16.4	250 + 33.6
3.5	100	36	250 + 14
4	100	42.2	250 + 7.8
4.5	100	44.2	250 + 5.8
5	100	44.8	250 + 5.2
5.5	100	45.0	250 + 5

Gl — 23.158 g.
A.N. – 1.515 g.
Seeded on – 13th Dec '51
Temp —

Glucose Cultures.

April	
1	20.8898 —
2	19.5350 —
3	19.9092 —
4	
5	
6	

Strength of Aq — 10 c.c of acid q requires
12.75 c.c of B10.

B10 — (0.63 g in 250 c.c.)
10 c.c oxalic acid
requires — 2.9 c.c of B10.

Wt of R=D bottle —
+ dist. water — 66.2446

(3) Iodine soln: —

50 c.c of I_2 soln ≡ 93.5 g hypo (3)

(3) hypo — 5 c.c of Copper Sulphate (10 g in 250 c.c.) will require 2.5 c.c of hypo.

Acid (8) 10 c.c ≡ 10.95 c.c of Bq.

Base (9) 10 c.c of n. acid. (1.5958 in 250 c.c.) requires 7.2 c.c of Bq.

5 c.c + 5 c.c Fehling's soln requires
≡ 0.056 gm of C. sugar.

(1)

Analysis of ?.. Glucose dark

Date :. 13th Dec '51 — 6 — 1.1382

Temp :. 22°C (1). 6' — 1.2052

Glucose

Alcohol. 66.2358 — 6 – 4.9800

6' – 1.2350

Vol. Acid. 35.5 / 36.1 > 0.6 c.c

T.A. 6.75 / 10.45 > 3.70

R.S. no sugar.

50cc in 100 c.c

N_2 in Culture.

40c.c in 50c.c. A8.

Alk 9. 11.6 / 42.55 > 30.95

C in 86m.

36.6 > 29.9 / 100 > 70.1, 4.6, 74.7

+ 44.3 / 48.9 > 4.6

C in Yeast in 25c.c. T.

Hypo 57.9 cc / 88.4 c.c

N_2 in Yeast.

B_{10} 2.1 / 50 > + 2.4 / 3.7 > 1.3

47.9
1.3
51.2

(2)

30
13

light (2)

Alchl. 66.2367
no Acid. Vol.

T.A.: 10.45
10.55

R.S. 0
2.35 } 2.35.

(7) 1.3904
(7)' 1.2468
7 – 1.4180
7_1 1.3800

N_2: 2.6
24.8 } 22.2

C in soln. 5 c.c in 50 c.c I_2
13.2
29.7 } 16.5

[3]

Galactose dark.

8 1.2878
8' 1.1460

Aldehyde 66.2138
r. Acid: No Acid

8 — 1.7480
8' — 1.3010

R.S. 0 / 2.35 > 2.35 c.c.

T.A. 10.55 / 10.9 > 0.35

N_2 24.8 / 48.35 > 23.55

C 3.6 / 9.8 > 6.2

[4]

light

9 — 1.2486

9' — 1.2270

Alcohol — 66.21 71 — no acid.

V. Acid — 36.15 / 36.2 > .05

9 — 1.5300.

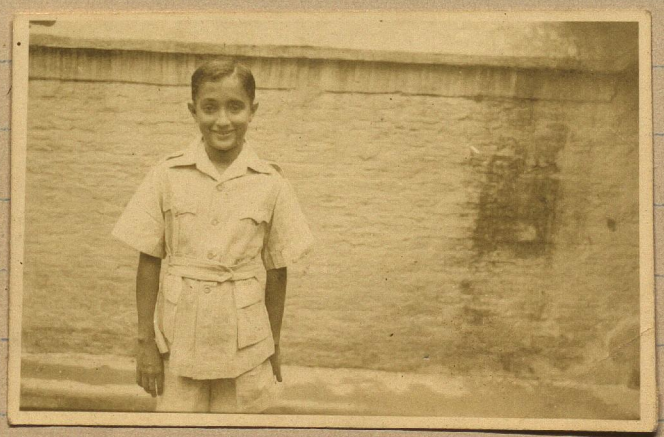
9' — ~~1.5292~~ 1.3464

R.S 0 / 2.35 > 2.35 c.c.

Nr 5.5 / 33.7 > 28.2

T.A. 10.9 / 11.2 > 0.3

C. 63 / 67.3 > 4.3.



[3]

Galactose dark.

8 1.2878

8' 1.1460

Alcohol 66.2138

8 — 1.7480

v. Acid: No Acid

8' — 1.3010

R.S. 0 / 2.35 > 2.35 c.c.

N_2 24.8 / 48.35 > 23.55

T.A. 10.55 / 10.9 > 0.35

C 3.6 / 9.8 > 6.2

BESTOWED WITH BEST WISHES

TO.

K.R. Anantaraman

By

C.R. Ganesh.

(5)

Maltose dextr.

10 — 1.1804
10′ — 1.1002
10 — 1.4224
10_1 — 1.2190

T. Acid 11.2 > 11.4.

dis water — 66.2472
Alc. 66.2500

V.A. nil.

C. 67.8 > 13.3
81.1

N_2 3.45 > 27.30
30.75

R.S. 0 > 4.0 c.c.
4.0

(b)

Maltose light.

T.A. 11.4 > 11.6

Alc. 66.2398

V.A. nil.

R.S. 0 > 4.4 > 4.4 c.c.

μ — 1.1202

μ' — 1.1430

μ — 1.3724

μ_1 — 1.3010

C. 53.9 > 67.0 > 14.1

N_2 6.8 > 34.0 > 27.2

(1) 1)

Date :- 11th
Temp :- 19.5 C

12 Sucrose dark.

12 – 1.2700
12₁ – 1.2696

Total Acid.

34 > 3.8
37.8

C 34.8 > 65.2
100 + 7.3
70.6 > 72.5
77.9

12 – 5.2116
12₁ – 1.2710

Cond.

R.D. bottle = 16.32489
Dist. H_2O – 66.2470
Wt – 66.2152 g
V.A. – 0.6 c.c.
0.02 yeast 25 c.c. 2_2
9.1 c.c hypo 3
41.6 >

R.S.

50 c.c in 100 c.c
5+5 0 > 85 c.c.
85 c.c

T.S.

0 > 65.0 c.c.
65.0

N_2 40 c c dist. in 50 c. c.

B9 6.4 > 36.0
42.4

N_2 in yeast -

B 10 3.9 > + 4.5 >
50 10

46.1
5.5
51.6

(8) II

Sucrose in light $13 - 2.2600$ $13 - 1.2080$

$13_1 - 1.4984$ $13_1 - 1.3254$

T.A. Carb. in Cult. N_2

37.8 / 39 > 1.2 0 c.c. / 33.1 > 33.1 c.c 40 c.c dist after k in 50 c.c acid 8

Barn 9. 6.75 / 36.2 > 29.45

R.S.

0 / 6.8 > 6.8 c.c. Alc 66.2398 g

V.A 50 c.c → 0.1 c.c.

T.S. 0 / 2.9 > 2.9 c.c.

A XIII 0.25g N_2 in 4

B 10.40 c.c + 34.9 / 50 > + 32.4 / 33.3 >

Cu yeast

0.02 in 25 c.c I_2

Hydrol(3) 41.8 / 79.0 > 37.2

15.1 / .9 / 16.0

(9) III

(10)

Ethyl alcohol dark $14 - 1.1990$ $15 - 1.1992$

$14_1 - 1.1\,2000$ $15_1 - 1.1566$

T.A

39.05 } 2.35
42.4 }

C.

2.9 }
82.7 } 79.8

N_2 7.5 }
44.15 } 36.65

$14 - 4.5200$

$14_1 - 1.2380$

Alc. 66.1330 g

V.A → 0.1 c.c.

C in yeast

0.02 g in 25 c.c of $\frac{1}{2}$(3)

Titr with hypo (3) 36.8 c.c.

B 10

N_2 in yeast: 0.5 g yeast in 50 c.c. of Ag

3.3 }
50 } + 46.7 c.c
4

27.8 }
28.2 } 0.4 } B_{10}

4.7.1

IV (10)

ईश्वर दास मिश्र कार्तिक

Ethyl alcohol → 15 – 1.3024 H_6 – 1.2210

light 15, – 1.2010 $H_{6,}$ – 1.1700

T.A.

42.4 }
42.65 } 6.25

N_2 6.8 }
33.0. } 26.2

Ac. 65.9642

V.A. 50c.c. → 0.1c.c

Control → 65.9388

Rein Soln. 5c.c in 50c.c I_2 3

Hypo 3. 0 }
61.6 } 61.6c.c.

Temp of Analysis of 1st 6.

Date of temp of other 4.

-X-

Glucose Cultures to be prepared:

I 40 c.c distln
50 c.c of A8
Base 6.4
9 42.4

1 — 1.0741
1_1 0.9940
2 — 1.0375
2_1 — 1.0664
3 — 1.1010
2_1 — 1.1891

B_{11} 10 c.c of
9.9 c.c = n. acid.
10 c.c A_{10} = 14.5 c.c
of B_{11}

Wt. of R.D. bottle + water — 66.2135

I no alcohol V.A. — 7.1
7.2

II 66.181 V.A. — 10.3
10.6

III 66.1928 V.A. — 0.1 c.c

IV 66.1800 V.A. — 0.1 c.c

V 66.2010 V.A. — nil

Date of seeding – 11. 11. 51 Date of analysis. 6.2.52

Tempr. – 27°.7C. Tempr. 23°C

Sucrose Cultures. 1 – 1.1419g – 1.2200

1, – 1.2046g – 2.4260

25c.c in 100c.c 5+5 c.c Fehling's soln

R.S. I ~~9.2c.c~~

4.5 14 II 9.5 ~~9.5~~ R.S.:– 9.6

~~II 19~~

9.6

19 T.S. T.S.

II 7.7c.c 7.7c.c

II 8.1 16.2 > 8.1 Total Acid

14 27.8 10c.c against B_{10}.

16.3 > ~~9.6~~ 14.9 15.95 > 1.05c.c

23.9

+ water → 66.1885

+ distillate → 66.1676

V.A. 28.9 29 > Devarda's.

(same) always 40c.c in 50cc Aq

B10 42.4.

Cleft in cotton

5cc. in 50c.c of 3

Hy 0.4 27.6 >

N_2. 40c.c distilled in 25c.c Aq.

B10 29.5 42.0 > 12.5

40c.c soln. N_2 by alkali.

25c.c Acid.

+ 10c.c

4.2 37.8 > 32.6

1.2200
1.1419
0.0781

2.4260
1.2046
1.2214
.0781
1.1433

2 — 1.1800 — 2.5032

2, — 1.1557 — 1.2392

R.S 9.6 c.c.

Total Acid. 16.1 / 17.4 > 1.3

Cin Culture
5 c.c. 50 I_3.

Alc 66.1644

T.S. 14 28 →

V.A. 0.1 c.c.

K.B. Ranjan 62.4

Devendra's: 40.65 c.c B_{10}

13.8 / 23.5 > 9.7

To be done.
N_2 in yeast
0.25g

~~T.~~N 15.75 / 29.45 > B_{10} 13.7
40 c.c ...
25 c.c Ag

N_2 by alk
25 c.c Ag

B_{10} 3.65 / 25.6 > 21.95

C in yeast 25 c.c ~~acid~~ I_3

0.02g. 14 : 23.0 c.c

2.5032
1.1800
1.3232
.0835
1.2397

1.2392
1.1557
.0835

3 — 1.1230 — 3.8750

3_1 — 1.1188 — 1.1996

C left in the cult

5 c.c. 50 A_9

H_4 62.6 / 99.1 > 36.5

25cc dil to 100cc T.S 10.5

R.S 10.8 c.c

~~Total~~ N_2 B_{10} 2.55 / 15.7 > 13.15

40c.c in 25cc Aq

N_2 by alk. 25.6 / 48.4 > 22.8

C in yeast - 0.02g in 25c.c ~~[illegible]~~ Aq

H 4 22.1 c.c

Total Acid

17.5 / 19.2 > 1.7

M_C — 66.1682

B_{10} V.A 0.55

Devarda's: 42.85 c.c B_{10}

N_2 in yeast — 0.5g in 25 c.c A_{10}

B_{11}. 13.2 / 17.6 >

1.1996
1.1188
.0808

3.8750
1.1230
2.7520
.0808
2.6712

4 & 5 filter papers got changed.

PH4:

4 — 1.1812 — 2.8660 I.

4_1 — 1.1046 1.2396 ←

25 in 100. R.S. — 9.3 c.c

I. Acid. 19.2 / 20.5 > 1.3

T.S. 25 c.c in 100

5.75 c.c.

A Alchl. — 66.1639

V. A. — 0.1 c.c

I 350 c.c Carbon in Culture.

H9. 1.3 / 29.3 > 28.0 c.c.

N_2 in Yeast 0.5g in 50 c.c of A_{10}

Rubaiyat.

25 c.c A9 N_2 in culture after K

B_{10} 4.7 / 22.7 > 18.0 c.c

B_4 — 26.3 c.c

40 c.c N_2 by alk.

25 c.c A9 2 / 25.1 > 24.9

T.N. in the culture including NO_2 nitric nitrogen 40 cc in 25 c.c. A9

B_{10} — 24.5 / 34.0 > 9.5 c.c.

N2 after adding alloy: 40 c.c 25 c.c A9 distilled in B10.

0.02g

C in Yeast. I 25 c.c

H4 21.7 c.c

2.7282 / 1.1545 / 1.5737 / .0730

1.2338 / 1.1608 / .0730

1.5007

34

7

~~pH 4.5~~ 5 — 1.1545 — 2.7282

pH 5   5₁ — 1.1608 — 1.2338

T-Acid. 20.6, 22.1 → 1.5

+N → 66.2135

Alc — no alcohol.

R.S.
25cc in 100cc. V.A — 50cc

4.2, 13.7

TES

0.02cc of B10.

C in culture.

L_3 50c.c 29.7, 58.5 → 28.8

H_4

N_2

22.9, 39.4 → 16.5

T S. 25cc in 100cc

2.55, 9.30

N_2 in yeast

0.5g in 50c.c

A_{10}

N_2 hydrk

25.1, 48.25 → 23.15

T.N. ammonical + nitric
40cc in 25 c.c. Aq.

B10. 6.8, 19.15 → 12.85

B_{11} 1.55, 29.5 →

C in yeast.

0.02g in 25c.c T_3

H4. 20.4c.c

2.28660
1.1812
1.6848
0.1350
1.5498

1.2396
1.1046
0.1350

N_2 to be expected.

pH 5.2

b_0 — 1.1162 — 1.3978 g

b_1 — 1.2300 — 1.3730 g.

T. Acid. 22.15 > 0.20
22.35

C in Culture 58.7 > 9.6
5 c.c
50 c.c 12
68.3

Alcohol — nil

V.A. — 0.1

N_2 in Culture by kj.
16.4 > 11.85
28.25

N_2 by alk
25.4 > 18.35
43.75

R.S. 25 cc in 100 cc
100 c.c.

T.S.
1.15 >
6.3

T.N. & Nilic + ammonical
40 cc in 25 c.c. D. Aq

B_{10}. 19.15 > 4.45 c.c
25.5

1.3978
1.1162
0.2816
.1430 + .3730
0.1386 1.2300
.1430

Alcohol. They grow slowly in Ann. nitrate.

B_{12} — [10 c.c of oxalic acid 0·63 gm in 250 c.c] requir 5·75 c.c B_{12}

10 c.c A_{11} requir — 30.35 c.c. B_{12}

Hypo 5 —

10 c.c of $CuSO_4$ soln titrated ag. H_5 —

~~6.6~~ 12.5
~~12.4~~ ~~5.8~~ 18.0 > 5·5 c.c

10 c.c of iodine 4 soln against H_5

18.5
28.1 > 9·6 c.c

Date of seeding — 24-11-51

Temp — 24°C (?)

Analysis — 23-4-52.

35°C

Control kept on 1st Dec '51

First water 66·0832

control — 65·8202

2.1474
.2984
.8490

1 — 1.2882
1, — 1.1950

1 — 3.3500
1. — 1.2026
T.A. 2.1474

1, — 1.3532
1, — 1.2548
.2984

5c.c tit against B_{12}

4.1
7.1 } 3.0

N_2 by alk.

40c.c dist in 20c.c
A_{11}

B_{12} 2.5
50.8 } 47.3

Alcohol 65.9912

V.A: 12.9
14.05 } 1.15

5cc ... dist in
50c.c. I_4

A_5 7.6
47.4 } 39.8

N_2 by Devarda's.

40c.c in 20c.c A_{11}. B_{12} = 4.9
19.7 } 14.8

N_2 by Kjeldahling 20c.c A_{11}

B_{12} 6.2
24.8 } 18.6

C in Yeast: 0.02g

1.6
35.3

N_2 in Y. 0.5g in 20c.c A_{11}
all through

B_{12} 4.25
41.0

$\left[\begin{matrix} 2 - 1.1984 \\ 2_1 - 1.2086 \end{matrix}\right]$ $2 - 1.2000$ — $2_1 - 1.1649$

1.28 12

5c.c 0812

$2_1 - 3.1056$

1.9407

·0812

2·45 1.8595

T.A. B_{12} 7·3 > 9·75

N_2 by alk

40c.c in 20c.c A_{11}

1·9 > 45·1

47

Alcohol - 66.0254

V.A. 14·2 > 1·2

15·4

N_2 by Devarda's 20c.c A_{11}

~~B_{12} 18.4c.c~~

Cin culture

47·7 >

86·1

N_2 after K.

20c.c A_{11} 3·3 > 3 6·4

B_{12} 39·7

N_2 in Yeast.

~~0.5g~~

2.45 >

B_{12} 38·6

C in Yeast.

36·0 > 35·7

71·7

3 — 1.2167
3_1 — 1.2040

3 — 3.3248
3 — 1.1562
2.1686
.1055

3_1 — 1.3589
3_1 — 1.2530
.1059

2.0627
T.A (5c.c soln)

N_2 by Kjelk
40cc dil in 20c.c A_{11}
2.2 } 47.1
49.3

C in C
34.9 } 38.8
73.7

N_2 by K.
20c.c A_{11}
B_{12} 24.8 } T 25.2
50
4.9
30.1
18 }
22.9

C in yeast
57.8 }
93.9

B_{12} 10.0 } 2.9
12.9

Alc. 66.0064

V.A. 18.15 } 1.35
B_{12} 19.50

N_2 by devarda's
40c.c dil
in 20c.c A_{11} B_{12} 19.75 } 28.35
48.10

N_2 in Yeast.
10c.c acid 0.15g Y
29.3 } 6.4
35.7

35

Y

[4 — 1.2250
4₁ — 1.25 29]

N_2 by alkali
40c.c dist
in 10c.c A_{11}

B_{12} 13.35

C in C

13.8 ⟩ 8.6
52.4 ⟩ 3

N_2 after K
20c.c A_{11}

B_{12} 3.9 ⟩ 30.5
34.4

0.028 Y in 50c.c I

Hy. 33.5c.c

4 3.1324 4_1 — 1.2163
4 — 1.1386 4_1 — 1.1382
1.9938 1.9157 .0781
.0281

T.A (5c.c.) B_{12}

15.45 ⟩ 2.65
18.1

Al. 65.9830

T.A. 19.6 ⟩ 4.15
23.75

N_2 by Devarda's 20c.c A_{11}
B_{12} 8.95c.c

N_2 in Y. ~~22~~ c.c 12 A_{11}

B_{12} 3.3 ⟩ 13.5
16.8

1.8954
·0792
1.9746

·0792

[2 — 1. 1398]
[5₁ — 1. 12.54]

2 — 1.2264
5 — 3.2010

5₁ — 1.1600
5₁ — 1.2392

N_2 by alk.
50c.c dist in
10c.c A_{11}

B_{12} 14.15c.c

Crml
52.5 }
90.0

N_2 by K A_{11} 20c.c
4.4 } 31.6

B_{12}
36.0

8.02 g of Y in
50c.c I.

Hypo. 33.2c.c

T.A. (5c.c : B_{12})
dilution

B_{12}
19.6 } 3.00
22.6

Alcohol. 66.0048

B_{12} V.A. 23.85 } 2.40
26.25

N_2 by Devarda's method

B_{12} 12.4 c.c

N_2 in Y 10c.c acid

16.9 } 5.3
22.2

2·1576 .0648 2·2224

6 — 3·3210

6 — 1·1528
6_1 — 1·2060

6 — 1·0986 , 6_1 — 1·2656

1·33 34

T.A. (5c.c 8th) ·0678

N_2 by alkali
40c.c dist.
in 10c.c A_{11}

B_{12} 15·65

B_{12} 28·5 } 2·9
31·4

A_{11} 66·0082

V.A 26·3
B_{12} 28·35 } 2·05

C in C 44·9 }
85·1

N_2 by Devarda's 20c.c A_{11}

B_{12} 18·4c.c

N_2 in Y 10c.c acid

22·2 } 6·5
28·7

N_2 after Kjeldahling
10c.c Acid

B_{12} 36·1 } 5·1
41·2

C in yeast.
50c.c I

N Hypo 34·2c.c

Glucox

14.5.52 I do not know whether you have waited for hours for any body, not on some business, but for some thing between you and the person. I have the opportunity of waiting for several hours for some body, just as today I am waiting for a person since 8:30 A.M. and this may be going to be 10:40 or more. This experience is unique, this is with a feeling mixed with anger, revenge and some thing which can not be expressed. Whatever the work may be for which the person might not be coming that can not be excused. May the person may be busy in talking to some body, or may be giving company to some do body else, may it be due to the greater interest there or necessity but it is

Kangan

I 1.2040 I_1 1.2640

~~14.5.52~~

1. Repeat – Glucose, alcohols.
ligh[illegible]   stut. [illegible]

2. 18;

0·25.
0·053 g N.
0·1 [illegible]
0·020 g
C_2H_5OH
= 16 / 6 / 24 / 46   24.

1 – Prepare culture at pH 5·5, 5, 4·5, 4, 3·5 and 3·0 containing 0·5% of C from ethyl alcohol, sucrose or glucose and 0·01% N. from ammonium sulphate under non aerated conditions.
18 cultures.

2. Prepare 12 cultures cultures at pH. 5.5, 5·0, 4·5, 4, 3·5 and 3·0 containing C and N as done previously using Glucose, Sucrose, and ethyl alcohol as source of C and (NH₄)₂SO₄ as source of N under aerated conditions. Analyse 200 c.c. after 30 days and 200 c.c. after 100 days.
C/N as in the previous set

Kenyon

7 - 10 - 0
6 - 0 - 0
13 - 10 - 0
4 - 0 - 0
9 - 10 - 0

2 II 1·2367 II, 1·2178

Curtains — 10-0-0 ✓

Tea — 10-0-0 ✓

Milk & Mineral — 5-0-0 ✓

Flour — 135-0-0 ✓

Thesis — 250-0-0 ✓

Cement etc — 60-0-0

470-0-0

~~533-0-0~~

~~63-0-0~~

Picture 8-0-0

Rails 6-0-0

Mason 15-0-0

29-0-0

1033
916
117

470
029
208
24
185
916

~~चालान~~

~~3. III 1·27 76 III 1·27 58~~

~~Ram Babu's father~~ Invitation	15 - 0 - 0
R. B. Servants	50 - 0 - 0
Electric charges	25 - 0 - 0
Fees	30 - 0 - 0
Fan	23 - 0 - 0
House	25 - 0 - 0
Commn money	25 - 0 - 0
Door	10 - 0 - 0
चूना & color	10 - 0 - 0
Pipe fitting	40 - 0 - 0
electric "	15 - 0 - 0
Paints	30 - 0 - 0
Labour charges	75 - 0 - 0
Dinner	150 - 0 - 0
Rupee	100 - 0 - 0
[Pocket Exp.	~~70~~ - 0 - 0]
	525 - 0 - 0
At home	65 200 - 0 - 0

290 - 0
170 - 0
460 - 0

790 - 0 - 0

60 - 0 - 0
500 - 0 - 0
160 - 0 - 0
720 - 0

725 - 0 - 0

4 1.2938 4 1 - 1.1347

	Lahu –	200 - 0 0 ✓	[illegible]
	R.K. –	300 0.0	Feb. M. April
	Father –	150 - 0.0 ✓	Jan
		2000 - 0 - 0	+ Interest
		2650 - 0 - 0	

Spent

34	[illegible] –	34 - 6 - 0	
2	Convey ch	2 - 12 - 0	200 -
24	Sugar	24 - 12 - 0	333
4	Maida	4 - 0 - 0	500 / 1033
1	Sack	1 - 5 - 0	829
50	Labour pam ch.	50 - 0 - 0	204 / 853
50	H. Expendi –	50 - 0 - 0	151
18	Thesis.	18 - 0 - 0	
~~24~~	Fan	22 - 12 0	207 - 15 - 0
207		207 - 15 - 0	185 - 0 - 0

24
29
400
915 11 - 0

Labour

5/2 1·2088 5-1·1934

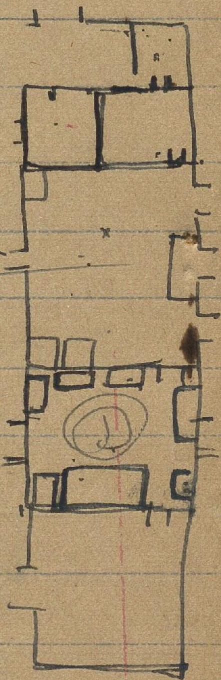
This month's

Thesis	18-0-0
Fan	23-0-0
Rangoon	100-0-0

Saree	75-0-0
Blown	14-0-0
Chedder	12-0-0
Invitation	8-8-0
Pipe	30-0-0
Conveyance	1-0-0
Betelnut	6-8-0
Printing Invit'n	5-0-0
~~Conveyance~~	~~1-0-0~~
House Labour	20-0-0
Cement	12-0-0
	185-0-0
Wheat	24-0-0
	29-0-0

20
15
15
15
65
25
5
2

470-0-0
174-0-0
185-0-0
829-0-0
29-0-0
24-0-0
88[?]29-0-0



বলাইচাঁদ বলাইচাঁদ

(b) 1.2894 b_1 – 1.2100

16th

Mother – 10-0-0
Sarkar – 2-0-0
Invi. Card – 4-12-0
Po. Expenses – 1-8-0
18-4-0
915-15-0
934-3-0
6-8-0
940-11-0
21-9-0
962-4-0

Electric – 5.0.0
Conveyance – 1.8.0
Cigarette etc
Cloth – 18-9.0
Rik etc – 3-0-0

Fruit Rik & Rik – 2-0-0
& cigarette
[illegible] – 1-0-0
21st
Box – 4-0-0
Paint & Varnish – 9-0-0
21st Sonar [illegible] – 10-0-0
Labour Char – 10-0-0
Coal – 5-0-0
Koa – 10-0-0
Puja – 5-0-0
Dal & [illegible] – 2-8-0
Tar Coal – 0-12-0
Veg – 1-0-0

Rik – 1-0-0.

61-4-0

1098
962
136

Rangame sister of Khargani

Effect of light on pH — 4·5

Total volume of sucrose & glucose — 400 c.c
of Et OH — 417·9 c.c.

Date of seeding — 30-1-52
Temp — 24°·2 c
Date of analysis — 13/3/52
114 Temp — 27°·5 C.

~~Wt of filter~~

Wt of bottle + dist. water → 66·1746

59
70
149

977-14-0
61-4-0
1039-2-0

1098.
1039
59

114

149
35
114
90

I Sucrose dark.

J.A. 9.1 > 13.2
10 c.c dil with B11 22.3

Alcohol. 66.1268

V.A. 1.4 c.c
B11.

R.S 8.2 >
25 c.c dil to 100 c.c 42.7

T. S. 35 c.c
25 c.c → 100 c.c

N2 40 c.c dist in 100 c.c A10.
84.25 c.c B11

C in Cult.
5 c.c in I4 100 c.c H4 2.1 > 35.7
37.8

C in yeast.
0.02 g dist in 50 c.c I4.
H4 66.7 > 20 c.c
84.7

N2 in Yeast. 0.5 g of yeast
B11 6.4 > 27.2
[A10. 55 c.c] 33.6

To be repeated

N_2

I Sucrose in Light

40 c.c dist in 100 c.c A_{10}

[B_{11} 55.95 c.c]

B_{11} 52.00 c.c

J.A. 22.3 → 27.7
10 c.c S. 50
B_{11} + 5.6 → 12.6
18.2

Alchl — 66.1500

B_{11} V.A — 1 c.c.

c in Culture. 5 c.c dist in 100 c.c I_4 38.3 → 48.9 → 10.6
H_4

R.S 5.2 c.c
25 → 100

N_2 in yeast.

T.S 4.8 c.c
25 → 100

XI) Alc. ? dark

N_2 in C
40 c.c dist in 100 c.c A_{10}

B_{11} 122.20 c.c

T.A.
5 c.c ~~[illegible]~~ alk
of B11

dist H_2O 66.14 ~~5~~74

Alchl — ~~65~~ 65.9113

V.A. — nil.

B_{11} control — 65.8356 g.

C in culture:

100 c.c I4 49.3
H4 90.1

C in yeast (0.02 g in 50 c.c I4)

H4 44.7
65.5

N_2 in yeast 0.5 g in ~~50~~ c.c in A_{10}

B_{11} 5.05
51.35 46.30

1.35

+7.5
25.9 18.4 64.7

IV Alc. light.

T.A. 16/2/32. flasks broken. 40c.c dist in.

10cc ChH

N2 100c.c Acid 10

ag. B_{11} 1.83 / 2.86

(B_{11} 4.65 / 49.7 > 45.05 c.c)

1.3c.c

Alchl - 65.7800

B_{11} — 45.2c.c

V.A — 0.25c.c

B_{11}

C in Culture: 100c.c I_4

H_4 4.25 / 48.00 > 43.75

Rangam

V Glucose dark

T.A
nil.

Alchl — 66.1300

V.A — nil.

N2 — 40c.c dist in 100c.c A_{10}

[B_{11} 119.5 c.c]

40c.c dist in 50c.c A_{10}

4 B_{11} 45.7c.c.

50c.c dist in 100c.c 4_4

4_4 9.1
27.9

0.25 g of yeast for nitrogen.

R.S
25 → 100

5.95 → 9.95
15.9

C in yeast 0.02

50c.c. 9_4.

100 to 4 84.8
100.00 + Adsh.
84.8 + 4
15.2
4
19.2 c.c hypo no 9.

N2 in yeast

55c.c A_{10}

4.5 → 45.5
B4 50.

+11.8 → 15.4
27.2

60.9

VI glucose light.

J.A.
100.c 20.6 → 29.4
of B_{11} 50 11.9
+2.1 → 41.3
14
Mchl – 65.9668
V.A – 14.25 → 2.95 c.c
17.2

R.S. 5.8 c.c
25 → 100

C in yest.
0.02g in 50 c.c I_4

H new (5) 34.2 → 33.4
67.6

Nn
40c.c dist in 100c.c A_{10}
B_{11} 58.70

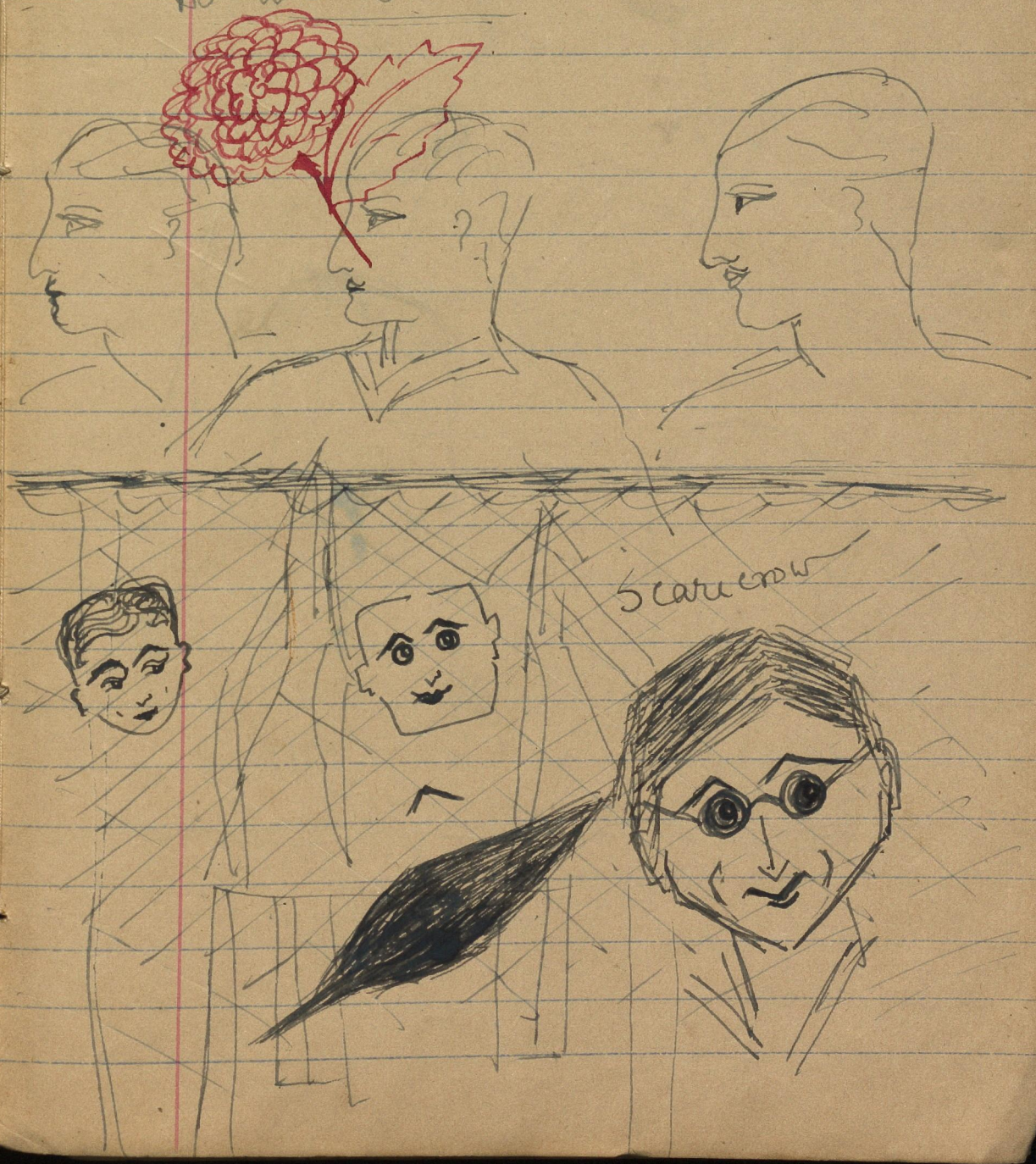
Repeat
5c.c dist in 100c.c I_4
4.6 →
8.9

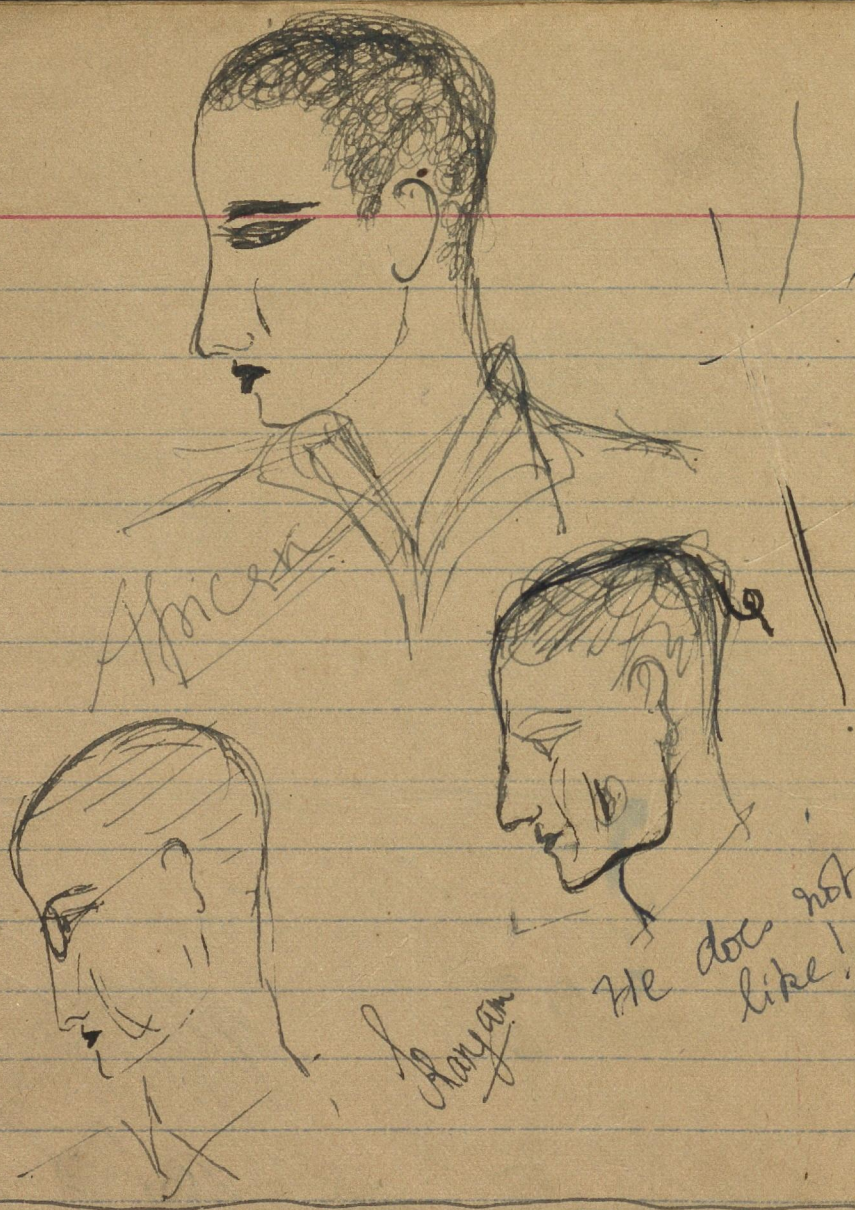
~~0.25g for N_2~~
0.1 g of yeast for N_2
A_{11}. B_{12} (20cc)

B_{12} – 3.6 → 47.4
50
+11.4 → 725
18.65 → 54.65

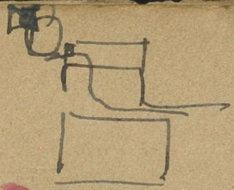

Salve !
Rangam

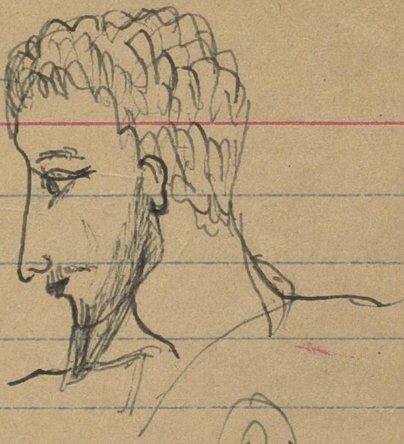
As we see it. nice.




Alice
Bayan
He doesn't like!

[illegible]
lotus





K f.am.+f.mino
Alk. f.amm.
Jeve — Amm — nitric

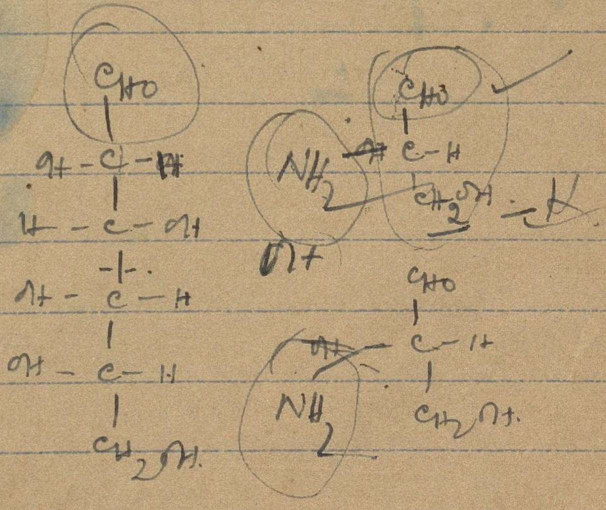
10 — 12

NH_4^+

NH_2

$[NH_3]OH$

NH_2



I will not take.

40c.c in 50c.c. Ag. N_2 in Culture.

0.5 in 25c.c Ag N_2 in yeast.

$\bar{1}.6990$.

B/10

$\bar{1}.5792$

19.65 × ·001931 × 10

$$= \frac{x \times \cdot 001931 \times \text{gg yeast}}{\cdot 5}$$

21.85

23.95

8.88

19.30

6.7

Ag ? B/10

$$\frac{xg \times 100}{\text{wt. of yeast}}$$

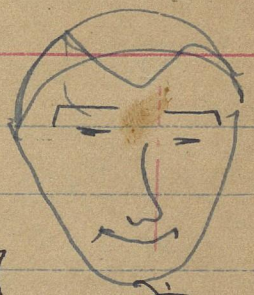
·0411

N_2 in soln	N_2 in yeast	percentage of N_2 in yeast	Fixation Loss
0.3795	0.1508	5.284	1· 0.00
0.4220	0.09214	5.451	− 0.0162
0.4625	0.0761	5.00	+ 0.0086
0.1715	0.1006	4.898	− 0.2582
0.3728	0.1350	4.937	− 0.2582
0.1294	0.1101	4.245	− 0.2908

7250) 14000 (·0019
7250
67500

अच्छी

	N_2 in Culture 40 c.c in 50 c.c Aq	N_2 in yeast 0.5 g-y in 25 c.c Aq.
B_{10}	19.65	~~31.68~~ 13.68
	21.85	13.48
21.55	23.95	=
	~~8.88 21.55~~	12.68
32.05	19.30	~~12.78~~
19.48	6.9	~~10~~ 10.98



चौंधा

लगता है वैसे ही

12.55 × 0.001931 × 3.812 / 0.5
12.15
15.5
16.65

1.1961
3.0603
3.2858

40c.c in 20c.c. Aq.
N_2 in
Culture.

B10

T5

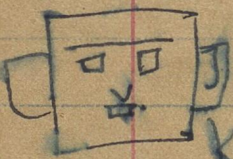
19.65 x ·001

21.85

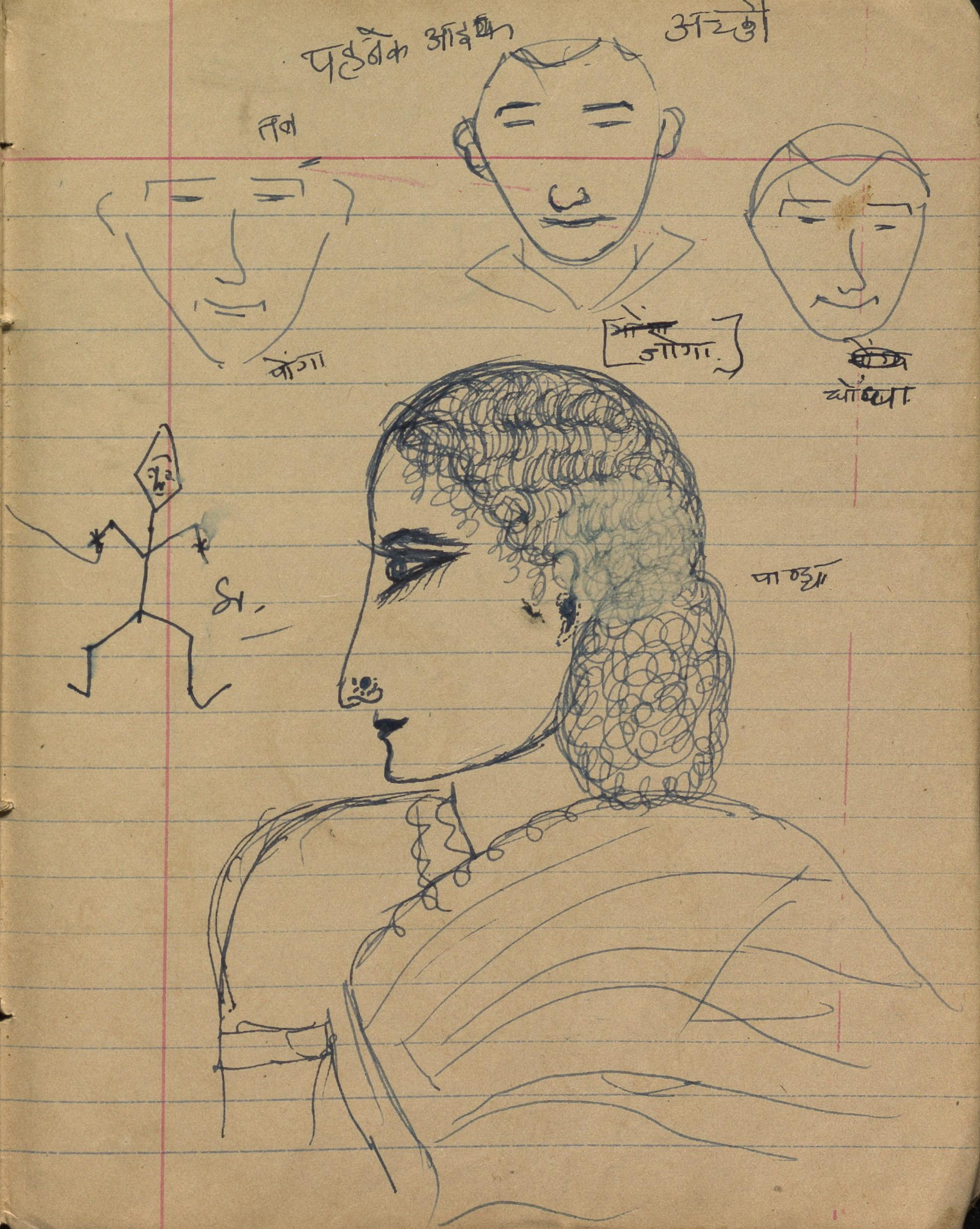
23.95

8.88

19.30

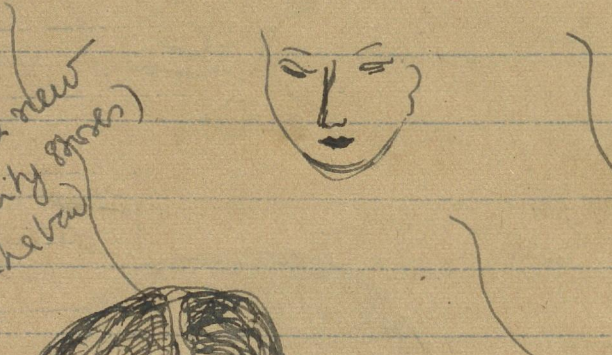


KB.

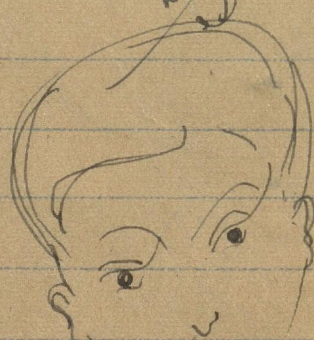


पोंगा
जोगा

Shyama Devi
9.B. Bairahna new
(Kavality gross)
Allahabad

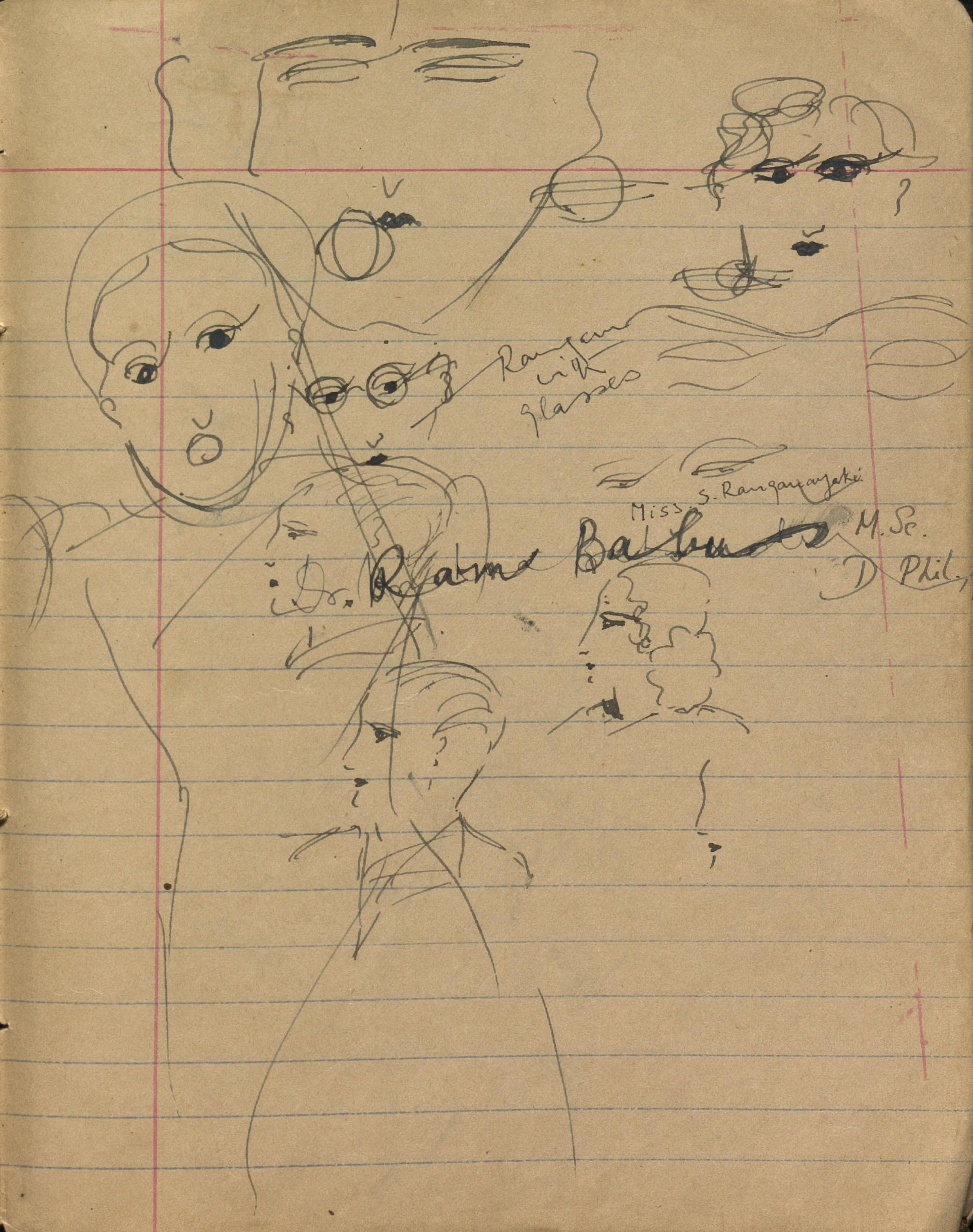


Dilly



Pom

Pom Pom Pom Pom
Pom Pom Pom
Pom Pom Pom Pom
Pom Pom Pom Pom

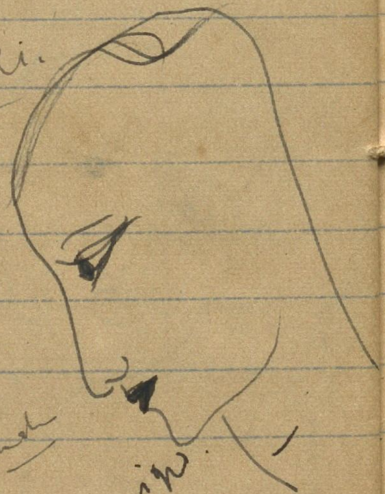

Rangam with glasses
Miss S. Ranganayaki
Dr. Rama Babu
M.Sc.
D Phil.

Rang Range

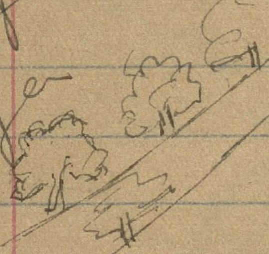
Range Range Rangam S

Rangsa

Ranganayski.



Range



12.0
228 -0.0
0 175 3 12 -0
S Range 4.20. 0 .5
35 0.0
8 50 0.0
H 56 0
14 10
135

S Rangsa

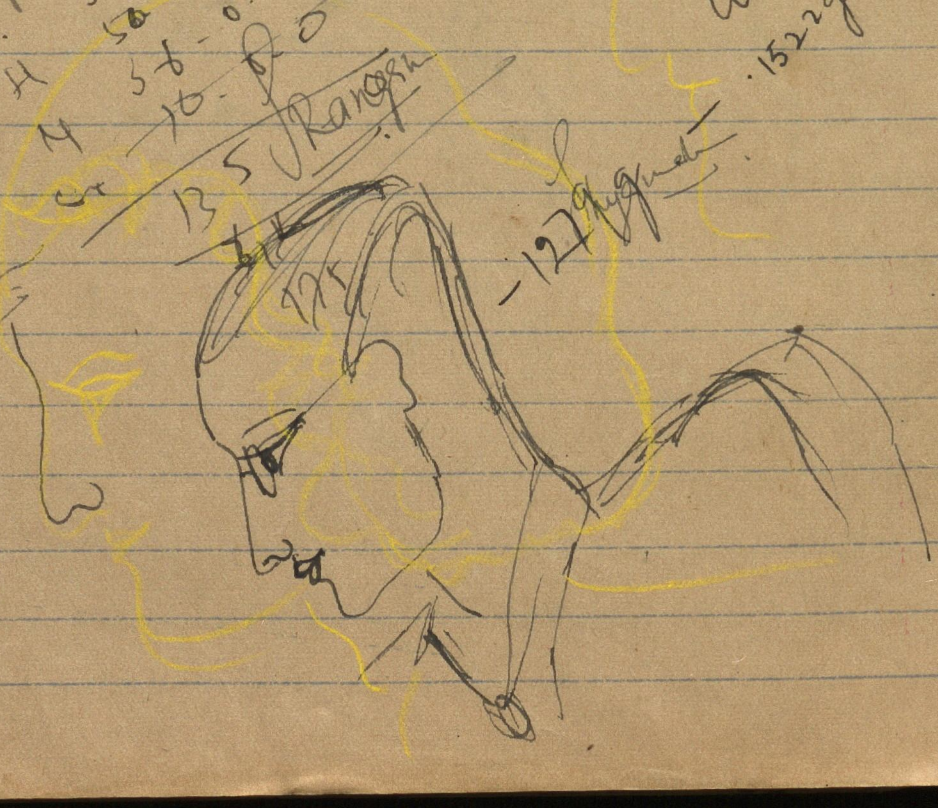
S Range

Shyamala

Amini

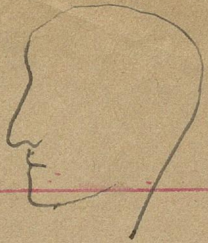
.1522 g.

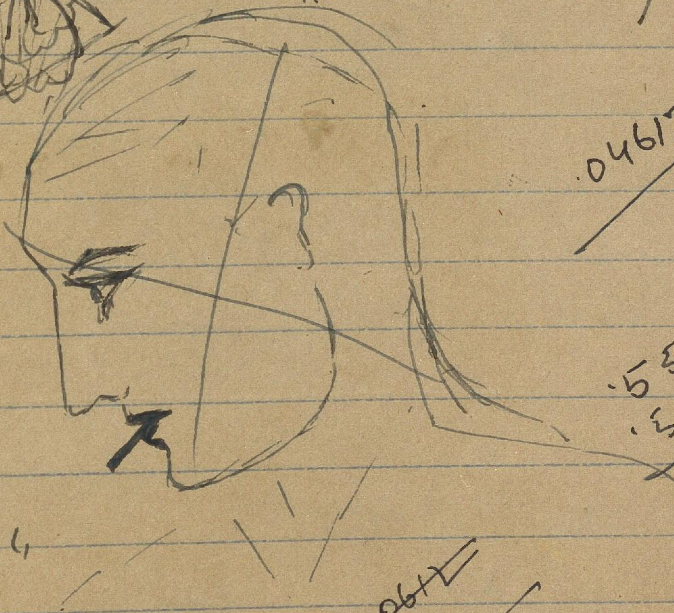
-127 Shyamala



கபாலி K

Amm
Amino.





.04612

மா
விநாகு

.5546
.5303
.0243
.1279
.15229

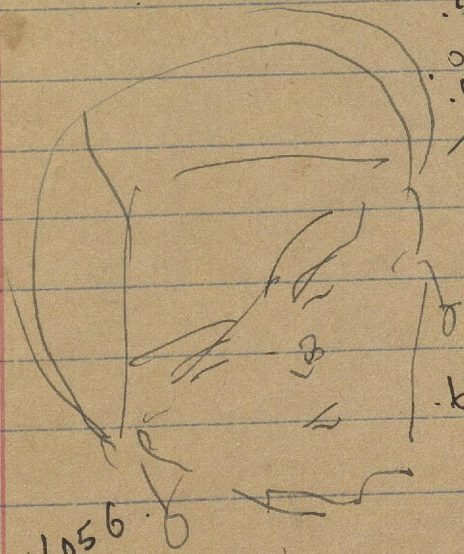
4 — 11.6
6 —

.0612
.04208

incidents

.2651
.2323

.5303 .0328



.6056

2651 g
1860
.0851 gm
.0328 gm

.6056

.1279 g

249.7 NH_4NO_3 5as boon
64
32
$(NH_4)_2SO_4$ — 90
63.71

liar
28
4
48
8.0

Ribbing — 120.

under arm — 14" stitches same

front. Height 16" till armpit 2 room [illegible]

back — 23" shoulder Centre 22".

T. Acid

(1) 2.9 / 7.8 > B 10

Ranganayaki S.

A.S. Ranganayaki N_2

(2) 7.9 / 9.9 >

B. 10.

6 — 2.1 / 50 > + 2.4 / 3.7 >

(3) 9.9 / 11.4 >

12 — 3.9 / 50 > + 4.5 / 10 >

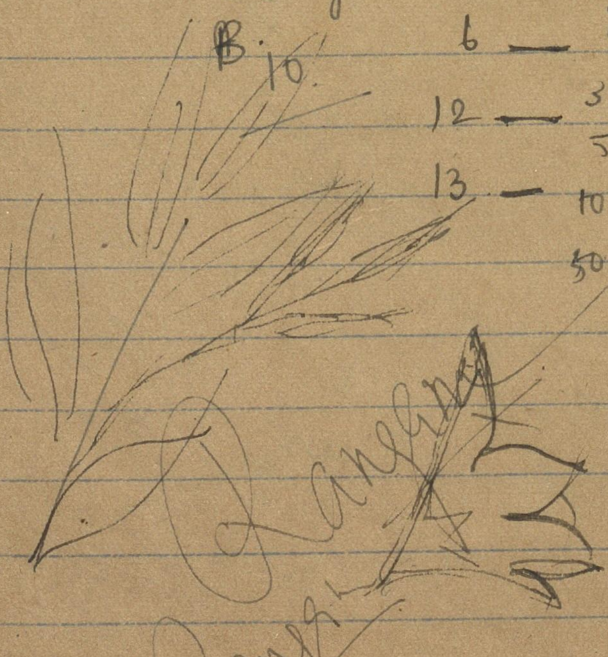
13 — 10 / 50 > + 34.9 / 50 > +

(4) 11.5 / 13.7 >

32.4 / 33.3 >

(5) 13.7 / 16.4 >

(6) 16.4 / 19.8 >



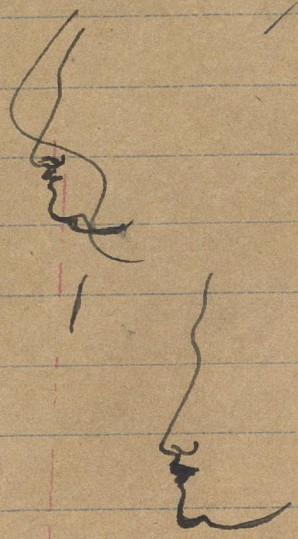
Ranganayaki.

Chest

very Creditable

Ranganayaki Iyer.

Ranganayaki Iyer



Chandraprabha.
C/o Sahu Bisheshwar Dayal
Zamindars
Bisauli.
(Dt Badaun)

C. R. LEKSHMY, M.Sc.,
C/o C. K. RAMAN EZHUTHASSAN,
RETIRED PARVATHIAM,
P. O. CHERP (COCHIN STATE).

Rangam

"Trifles even lead to Heaven.
Trifles make the life of man."

Sweetness of temper is the quality of a cultured mind.

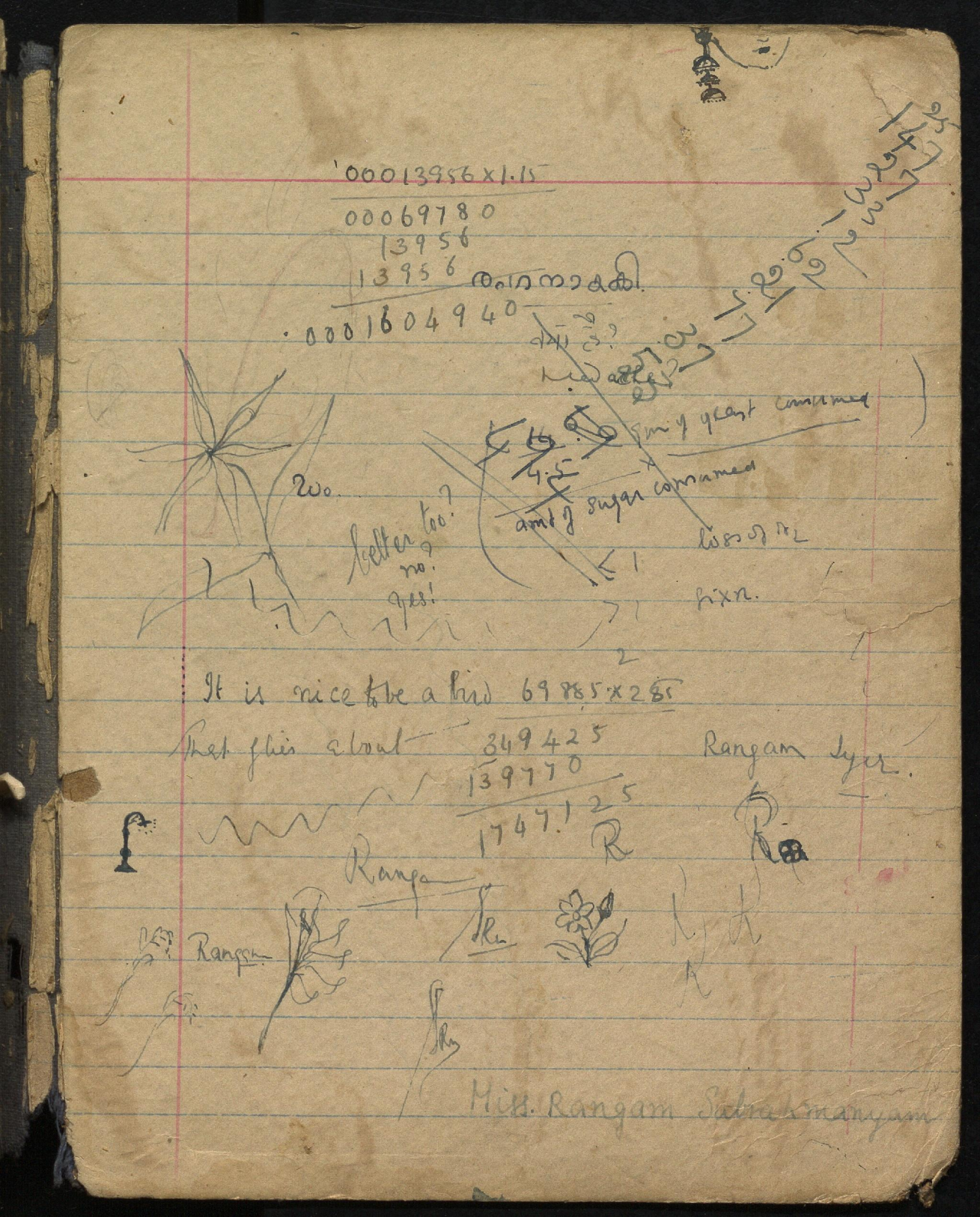
Rangam
Rangam
Rangam

Rangam's

Rangam's

Idiosyncrasic

ரங்கம்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00069780
13956
13956
.00016049 40
Rangam Iyer.
Rangam
Miss. Rangam Subramanyam