RECORD OF WORK

IN

Practical Chemistry

CHEMICAL LABORATORY

Allahabad University

NAME _____

CLASS _____

BISHAN LAL BHARGAVA & SONS
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KATRA, ALLAHABAD.

192 Pages

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TABLE FOR REFERENCE AT CHEMICAL LABORATORY

Atomic Weight

1.	Aluminium	... ...	26·97	14.	Magnesium	... ...	24·320
2.	Arsenic	... ...	74·96	15.	Manganese	... ...	54·930
3.	Barium	... ...	137·360	16.	Nickel	... ...	58·690
4.	Bromine	... ...	79·916	17.	Nitrogen	... ...	14.008
5.	Calcium	... ...	40·070	18.	Oxygen	... ...	16.000
6.	Carbon	... ...	12·00	19.	Phosphorus	... ...	31 020
7.	Chlorine	... ...	35·457	20.	Potassium	... ...	39·104
8.	Chromium	... ...	52·010	21.	Silver	... ...	107·88
9.	Copper	... ...	63·570	22.	Sodium	... ...	22·997
10.	Hydrogen	... ...	1·008	23.	Strontium	... ...	87·63
11.	Iodine	... ...	126 931	24.	Sulphur	... ...	32
12.	Iron	... ...	55·840	25.	Zinc	... ...	
13.	Lead	... ...	207·21				

Factors

No.	Sought.	Found	Factors	No.	Sought.	Found.	Factors
1	Al	Al_2O^3	0 52912	7	Pb	$PbCrO_4$	0·64108
2	Ba	$BaSo_4$	0 58846	8	Mg	$Mg_2P_2O_7$	2·21843
3	Ca	CaO	0·71464	9	Ni	NiO	0·78578
4	Cr	Cr_2O_3	0 68425	10	Ag	AgCl	0·75
5	Cu	CuO CuS	0·79892 0·66475	11	Cl	AgCl	
6	Fe	Fe_2O_3	0 69939	12	SO_4''	$BaSO_4''$	0·41137

Gram equivalents

Iron Ammonium sulphate $FeSo_4(NH_4)_2 So_4, 6H_2O$ } 392·136 grams.

Potassium permangnate ... 31·606 ,,

,, dichromate ... 49·033 ,,

Oxalic acid $(COOH)_2, 2H_2O$ ... 63·016 ,

Sodium carbonate ... ... 53 ,,

Caustic soda ... ... 40 ,, (approx)

Sulphuric acid ... ... 31 c c.

Hydrochloric acid ... ... 107 5 c. c.

Arsenious acid ... ... 49·48 gms. pure As_2O_3 per litre for normal soluti

Iodine ... ... =126 931 gms of pure lodi

Sodium thio sulphate (Hydro) ... 248·194 gms. of pure N

$Na_2S_2O_3$ $5H_2O$ ... normal solu

Going to Moscow (U.R.S.S) to participate in the International Symposium on Origin of Life organised by the Academy of Sciences, URSS. ~~I~~ The symposium will be held for 19th to 29th August 1957 and I intend to stay there for about a month ~~in~~ ~~at Moscow in~~ ~~U.R.S.S.~~ Russia

~~I~~ I am getting the travel grant from the Academy of Sciences, URSS. for going to Moscow & back to India. ~~The fare~~ under the auspices.

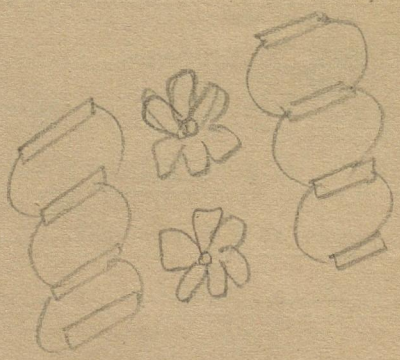
Exp. No (1)

Date 24/9/55

To identify the given solution for three basic radicals.

State :- Solid Powder.

S.No	Expt.	Obs.	Inference.
1.	To the sol^n of the given powder added Dil HCl	No ppt.	1st grp. absent.
2.	Next by boiled the filtrate from grp. first and passed H_2S to a small portion of the test tube	A ppt appears	IInd grp. present
3.	Then passed H_2S in the whole of the quantity of filtrate & filtered	×	×
4.	To the ppt from (3) wash with water and treated it with about 10 c.c. of yellow Ammonium Sulphide. washed it with H_2O and boil it with 5 c.c of HNO_3 then filtered.		×
5.	To the filtrate from (4) took a little in a test tube added Conc H_2SO_4 to it. Evaporated to fumes, diluted & filtered.	White ppt Comes	Pb suspected
6.	To this white ppt in (5) added Concentrated Sol^n of Amm. Acetate and filtered. To this filtrate added Pot. Chromate	A Yellow ppt or $PbCrO_4$	Pb (ic.) Confirmed



Exp. No. 2

Date
25/9/15

Object:- To Analyse the given mixture for three basic radicals.

S.No	Experiment	Observation	Inferences.
1.	In the absence of first grp I took the filtrate of 1st grp, added a little dil HCl, heated & passed H_2S	A ppt appears	IInd grp present
2.	Filtered the above ppt & dissolve a little of it in yellow Ammn. Sulphide	Black ppt did not dissolve	II (A) is present.
3.	Dissolve the above ppt in dil & hot HNO_3 & filtered.	Black ppt as residue appears.	Hg (ic) may be present
4	To this black ppt dissolved in Aqua regia. Diluted & filtered & Confirmed Hg(ic)	A white or greyish ppt	Hg Confirmed
5	To the filtrate from (4) added Conc. H_2SO_4. Evaporated to fumes & diluted & filtered.	No ppt	Pb absent.
6	To the filtrate from (5) excess of NH_4OH & filter	No ppt	Bi "
7	The filtrate is blue & Confirmed by adding excess of acetic acid then $K_2Fe(CN)_6$	Red ppt.	Cu Confirmed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S.No	Experiment	Observation	Inference
8.	Acidify the Sln soln of (7) with an excess of Conc. HCl & passed H_2S. Filtered off the black ppt of CuS. Diluted it largely & passed H_2S again - a yellow ppt	Black ppt Yellow ppt	Cd (suspected) Cd confirmed

Result:- The mixt. Contains :—

Hg , Cu & Cd

on the night 7

8.

S.No	Expt.	Obs.	Inf.
8.	Acidified the 2nd part of the solution with HNO_3 & then added NH_4Cl in excess, warmed.	A white gelatinous ppt. Cone.	Al Confirmed

Result:- The Mixture Contains:-
Fe, Al, Cr.

x^n 1^st so ... form white ppt	"	W gp. absent.
...$_4CO_3$ ... filter.	No "	
...e ppt in acetic ...o K_2CrO_4	~~Yellow~~ ppt	Ba present
$(NH_4)_2SO_4$ sol^n in ...xcess. filter the ppt ... $(NH_4)_2C_2O_4$	white ppt	Ca "
sol^n + Na_2HPO_4	White Crystalline ppt.	Mg present

The mixt. Contains —
Ba, Ca, Mg, Cl, Br

Exp No. 4

Date 9/11/55

Aim — To analyse a given mixture for five basic acid radicals.

S.No	Experiment	Observations	Inferences.
1.	Mixt + Na_2CO_3, boil & filter		
2.	filtrate + H_2SO_4 dil in excess + $NaNO_2$ Heat.		
(3)	Solution (2) + Na_2CO_3 + Conc. HNO_3	Sol^n gets Colourless	Bromide
(4)	Sol^n + $AgNO_3$	White ppt.	Chloride
(5)	Mixt + dil HCl	Soluble	I grp. absent
(6)	Passed H_2S in (1)	No ppt	II grp. absent.
(7)	Solution (6) boiled + a drop of HNO_3 Conc, again boiled + NH_4Cl + NH_4OH in excess	No ppt	III grp. absent
(8)	Passed H_2S in Sol^n (7)	"	IV grp. absent.
(9)	Boiled off H_2S from (8) grp add NH_4Cl + NH_4CO_3 Wash & filter.	No "	
(10)	Dissolve the ppt in acetic acid add K_2CrO_4	Yellow ppt	Ba present
(11)	Add $(NH_4)_2SO_4$ in excess. Filter the ppt & add $(NH_4)_2C_2O_4$ + Na_2HPO_4	White ppt White Crystalline	Ca " Mg present

Result — The mixt. contains — ppt.
Ba, Ca, Mg, Cl, Br

Exp. 5

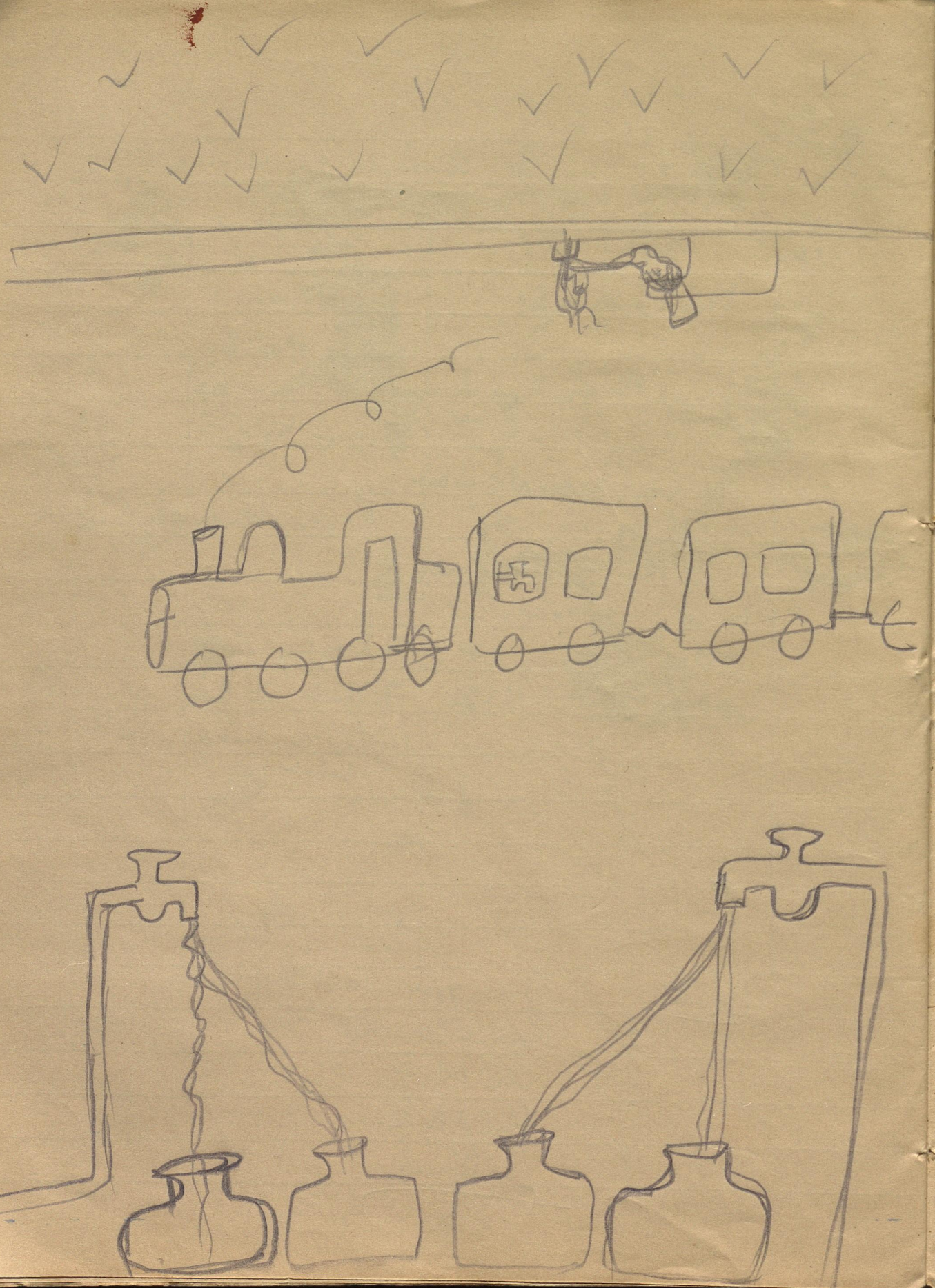
Date 16/11/53

Object :- To Analyse the mixture for six acid radicals

S.No	Expts.	Obs.	f
1.	Mixt + H_2SO_4 dil	Brisk Effervescence, Colourless, odourless gas given out	
	Passed the gas through lime water	Turned milky.	Carbonate
(2)	Sodium Carbonate filtrate add $BaCl_2$ and filter	Residue black	Sulphide
(3)	To the filtrate add $BaCl_2$ in excess and filter. Acidify with excess of HCl & filter.	Residue white	
		Filtrate, add Br_2 water and shake white ppt.	Sulphite

Result :- The given mixture contains:

(1) Carbonate
(2) Sulphide
(3) Sulphite
(4) Sulphate



Exp. No. 6

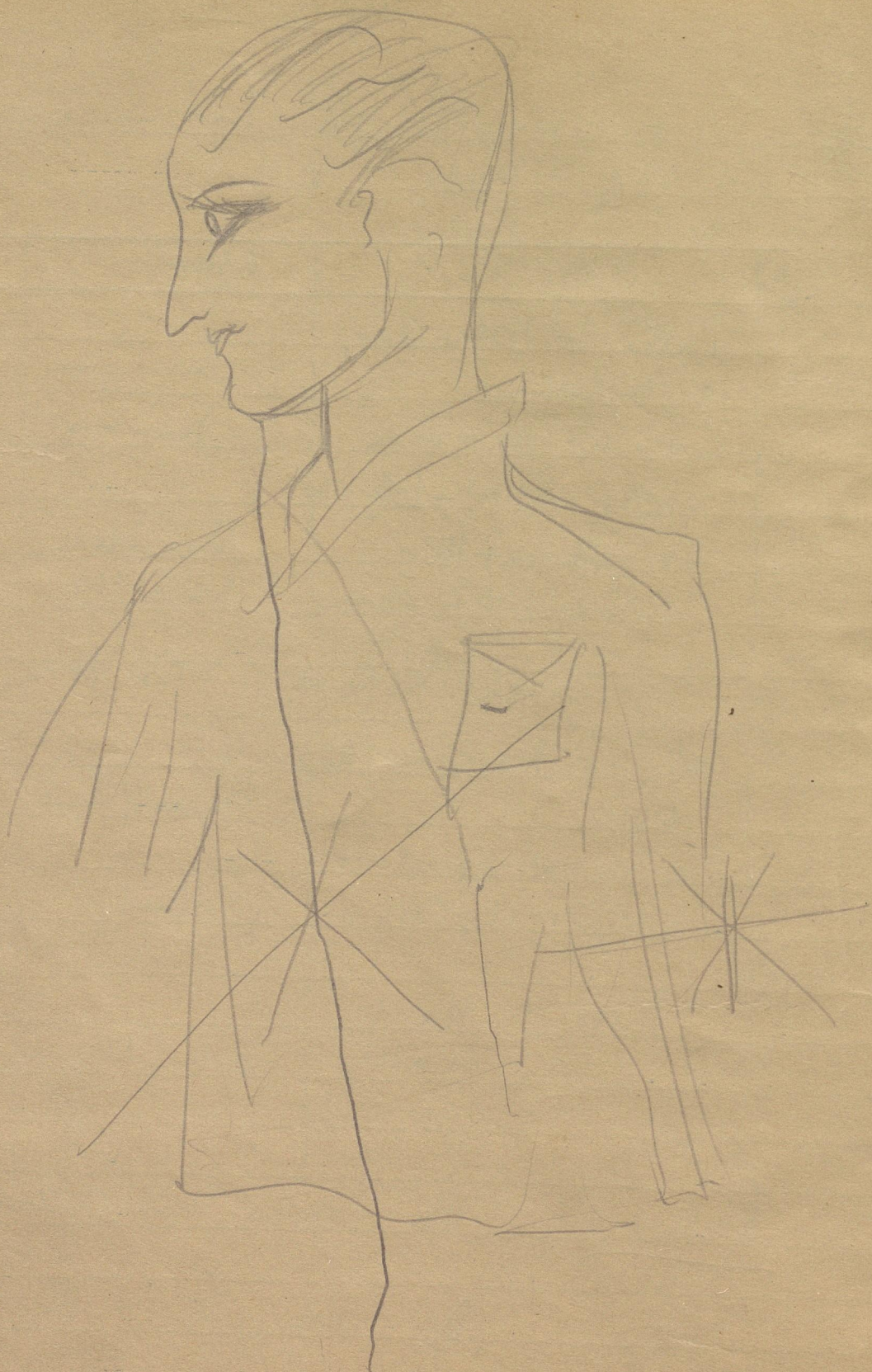
Date 17/11/55

To Analyse the given mixt. for 6 radicals. To test for Cr_2O_3 & Cr_2SO_4.

S.No	Expts.	Observations	Inference
1.	Mixture + H_2SO_4 Conc; add Cu. turnings	Brown fumes	NO_3 (?)
	(i) Orig: Sol^n + Fe Sulf + H_2SO_4	Brown ring	NO_3 Confirmed
(2)	Sodium Extract + $PbCl_2$ boiled and filtered + $PbCO_3$	Turns black.	S present
(i)	Filtrate (ii) + HCl + Barium and filter	white ppt.	SO_4 ..
(3)	Filtrate of (1) add Ba_2 water	white ppt	SO_3 ..
(i)	Residue Na_2CO_3 and flame tested	Green flame	Ba present
	Na (extract) + Acetic acid filtered + K_2CrO_4	Yellow ppt.	Ca (Confi)
(4)	Mixt + NaOH heated	Smell of NH_3.	Nitty present.

Result:- The given mixt. Contains —

NO_3, SO_4, SO_3, S, Ba, Nitty.



Exp. No 7

Date 24/11/58

To Analyse the given mixt for 7 radicals in presence with phosphate

S.No	Experiments.	Observations	Inference.
1.	Mixt + Conc HNO_3. Heated (filter if the whole thing does not dissolve) add Ammonium molybdate and boil again	Canary yellow ppt	Phosphate.
(2)	Mixt + HCl (dil) add $BaCl_2$	Heavy white ppt	Sulphate
(3)	Fuse a portion of insoluble salt with equal wts of Na_2CO_3 & K_2CO_3 or KNO_3 on porcelain when a yellow mass obtained. Dissolve it in water, add acetic acid & add add acetate	Yellow ppt.	Cr_2O_3
1.	Mixt. + NaOH	Smell of NH_3	NH_4 present
	Mixt + Dil HCl	Soluble	Ppt. absent
(2)	Passed H_2S in (1)	No ppt.	Do .. ..
(3)	Sol^n I add HNO_3, boiled add NH_4Cl add NH_4OH	Blue ppt	Iron Confd
	(i) Portion of Sol^n (1) + $K_4Fe(CN)_6$		
(4)	(ii) Sol^n ppt + NaOH → boil this was done till no more of NH_3 evolved + Br_2	Brown ppt.	Al. Confirmed
	(iii) filtrate + NH_4OH, boil for mixt + Sol^n was filtered.		
(5)	Filtrate + NH_4Cl + NH_4OH Passed H_2S	No ppt.	Mg absent

The Sol^{n} was filtered, as there was insoluble portion in it.

Removal of Phosphate :-

Before adding NH_4Cl add NH_4OH in the Sol^{n}, a part of Sol^{n} is treated with $K_4Fe(CN)_6$ to see whether Iron is present or not. If Iron get blue Colouration. The Sol^{n} is treated NH_4Cl & NH_4OH. A ppt will be obtained. It is treated with acetic acid And Sodium acetate till the ~~obtained~~ of Ammonia is replaced by acetic acid smell. If IInd Sol^{n} is not present the ppt will be Completely dissolved. Then the mixt add Fecl$_3$ till tea like Colour Comes, boil it well & filter. The ppt is subjected to the test of IInd Sol^{n}. Filtrate is treated with NH_4OH, a brown ppt is obtained. It indicates the excess of Fecl$_3$, if no the excess of Fecl$_3$ is ppt'd on addition of NH_4OH to the whole Sol^{n}. After this the filtrate is subjected for the tests of subsequent Sol^{n}s radically

Exp. No. 8

Date:
30/11/05

To Analyse the given mixt. for 8 radicals interfering with Oxalate.

S.No	Experiments.	Observations.	Inference.
1.	Mixt + H_2SO_4 dil. till no effervescence, add MNa	Fresh Effervescence	Oxalate
(2)	Neutral $FeCl_3$ (Mixt + H_2O) or (Mixt + HCl + NH_4OH) added to $FeCl_3$	Red Colouration	Acetate
(3)	Mixt + H_2SO_4 dil.	Effervescence Con in cold.	CO_3.
(4)	Mixt + NaOH	Smell of NH_3	NH_4^+ present
(5)	Mixt + HCl Dil.	Soluble	Ppt absent
(6)	Passed H_2S in (1)	a Colour appeared filte.	
	(i) Residue Shake with Yellow Am. Sulphide & filte		
	(a) Residue	for Cu ppt.	absent
	(b) Filtrate	" As "	present
(7)	Add HCl dil in excess & filte		
	(a) Filtrate add Iron nail & heat & filte		
	(1) Residue	Black Dissolve in HNO_3 + tartaric acid, add dilute & pass H_2S Orange ppt	Sb. Sb Confirmed

8. Filtrate + a drop of HNO_3, boil & remove the H_2S gas add NH_4Cl + NH_4OH.	A ppt appears is shortly agitated on a piece of preclar & residue is treated with dil HCl. Heated & filtered Again add NH_4Cl & NH_4OH in ppt obtained, ppt tested as usual. The filtrate mixed with previous one the oxalate is removed	
(9) Add NaOH excess & Br_2 water and filter.		
(a) Residue	For Fe	absent
(b) Filtrate + add HNO_3, dilute heat & add NH_4OH in excess.	White ppt	Al present
(10) Filtrate pass H_2S & filter	A ppt appears.	(IV) group present
(i) Residue shake dilute HCl, boil & filter		
(ii) Filtrate boil of H_2S add excess NaOH, boil & filter.		
(a) Residue		
(b) Filtrate Pass H_2S —	White ppt	Zn present
11 Filtrate add $(NH_4)_2CO_3$ and filter.	(i) Residue	
(i) Residue dissolve in acetic acid add $K_2Cr_2O_7$ and filter.	(ii) Filtrate add Am sulphate & filter. Residue add Amm. oxalate	Ca present
Result: The given mixt. contains		

C_2O_4, NH_4, Ca, Sb, Zn, CO_3, Al, Acetate.

Exp. No 9

Date 1/12/55

To Analyse the given mixture

S.No	Expts.	Obs.	Inf.
1.	Mixt + HCl dilute and add $BaCl_2$	Heavy white ppt insoluble in mineral acid add water.	Sulphate
(2)	Mixt + HNO_3 Conc. add Amm Molybdate.	Canary yellow ppt.	Phosphate
(3)	Mixt + NaOH Warmed	Smell of NH_3	Amm present
(4)	Mixt + HCl Dil	Soluble	Excess absent
(5)	Passed H_2S in ?	a ppt appears	
(a)	Ppt + yellow Amm. Sulphide + HNO_3 & filter	Slightly Soluble	
(a)	Filtrate + acetic acid + $K_4Fe(CN)_6$	Red ppt.	Cu (Confd)
(b)	Filtrate + HCl dilute filter and add HCl Conc. & Heated		
(1)	Residue + HNO_3 Conc + Amm Molybdate	yellow ppt on heating	As present

Result:- The given Mixt. Contains :-

PO_4^{---}, NH_4^{+}, Cu^{++}, As^{+++} for $---$

Exp. No. 10

Date 7/12/15

To Analyse a given mixt

S.No	Exp.	Obs.	Inf
①	Mixt + H_2SO_4 (Conc) add cu turnings	Brown fumes.	Nitrate
②	Mixt + dil HCl	Soluble	Ppt absent
③	passed H_2S in ①	No ppt	Ppt "
④	Sol^n I + a drop of HNO_3, boiled + add NH_4Cl + NH_4OH excess.	No "	Ppt "
⑤	Passed H_2S in Sol^n ④ & filter	a ppt appears.	Zn ppt absent
⑥	Residue dissolve in HCl Conc. $KClO_3$ add $NaHCO_3$ in excess + Bromine water	apple green colour white ppt	Co (CoS) Zn (")
⑦	Filtrate + NaOH excess & pass H_2S		
⑧	Filtrate Ppt + $(NH_4)_2CO_3$ Residue dissolve in Acetic acid + K_2CrO_4 drops	Residue yellow	Ba($BaCO_3$).
⑨	Filtrate + $(NH_4)_2SO_4$ add $(NH_4)_2C_2O_4$	white ppt.	Ca present

Result:- NO_3^-, Co^{+++}, Zn^{++}, Ba^{++}, Ca^{++}

VOLUMETRIC

Exp. No. 13

Date
22/12/55

Object:- To find out the Strength of the given Oxalic acid.

OBSERVATIONS:—

1. Weight of the weighing bottle (tube) approx = 2.8854 gms
2. .. .. .. + Oxalic Acid. (N/20) = 3.2054 ..
3. .. .. Weighing tube again = [redacted] ..
4. Capacity of the flask = 100 c.c. = 2.8943 ..

Calculations:-

Weight of Oxalic acid taken = .3151 gm.

OBSERVATIONS - for- Standard Solutions:-

S.No	Oxalic acid taken	I reading of $KMnO_4$	II reading of $KMnO_4$	Difference
1.	10 c.c.	1.0 c.c.	8.7 c.c.	7.7 c.c.
2.	..	9.0 ..	16.7 ..	7.7 ..
3.	..	18.0 ..	25.7 ..	7.7 ..
4.	..	26.0 ..	33.6 ..	7.6 ..

With the Unknown:—

S.No	Oxalic acid taken	I reading of $KMnO_4$	II reading of $KMnO_4$	Difference
1.	10.0 c.c.	20.0 c.c.	27.4 c.c.	7.4
2	10.0 ..	28.0 ..	35.4 ..	7.4
3.	10.0 ..	5.4 ..	12.8 ..	7.4
4.	10.0 ..	13.0 ..	20.5 ..	7.5

Calculations:- $n \times 10 \times \frac{V_1}{V_2} \times 10$

$\frac{7.4}{7.7} \times .3151 \times 10 \times 10$ gms/litre.

$= \frac{74 \times 3151}{7700} = \frac{233174}{7700}$ gms/litre.

Error:-
$V_1S_1 = V_2S_2$
C.V = 31.5 gms/litre. $\frac{0}{10} = .05\%$ $= 30.2823$ gms/litre.

Result:- The Strength of the given Unknown Oxalic acid Solution $= 30.2823$ gms/litre.

Error $= 3.5\%$

Exp. No. 14.

Date
11/1/56.

Object:- To analyse a given mixture into acid + basic radicals.

S.No	Experiment.	Observations	Inferences
1.(a)	Mixt. + H_2SO_4 (dil).	Brisk, Effervesence.	CO_3^{--}
(b)	Passed the gas through lime water.	Turned Milky.	Carbonate (Confirmed.)
2.	Mixture + HCl dilute	Soluble	I grp. absent.
3.	Passed H_2S in I	No ppt.	II grp. "
4	To the solⁿ thus add a drop of HNO_3, boiled, added $NH_4Cl + NH_4OH$	No ppt	IIIrd grp. absent
(5)	Passed H_2S in III. and filtered		
	(1) Residue shake with dil HCl boil & filter.	(1) Residue - ... residue	Mn absent
	(2) Filter, boil of H_2S and add excess NaOH, boil & filter. Passed H_2S in filtrate	White ppt.	Zn. present
(6)	Filtrate of 8th + NH_4OH + $(NH_4)_2CO_3$ and filter. Dissolve the ppt² in acetic acid + add K_2CrO_4 in excess & filter	White ppt	Ba present
	add $(NH_4)_2C_2O_4$	Yellow ppt	Sr "
(7)	To the filtrate of 8 did test for Mg.	White ppt	Mg^{++}.

Result:- The given mixture contains CO_3^{--}, Zn^{++}, Mg^{++}, Ba^{++}, Sr^{++}.

Exp. No.

Date
12/1/56.

Object:- To find out the Strength of the given - $FeSO_4 \cdot (NH_4)_2 SO_4 \, 6H_2O$.

(1) Wt of Weighing tube = 2.890 gm. approx.
(2) " " Salt + Wei. tube = 4.8562 "
(3) Again Weight of tube = 2.8976 accurately.
(4) Wt of $FeSO_4 (NH_4)_2 SO_4 \, 6H_2O$ = 1.9586 "
(5) Capacity of flask = 100 c.c

For the Standard Solution:-

S.No	Prepared Solution taken in pipette	I reading KMNO4	II reading KMNO4	Difference
1.	10.0 c.c.	1.0 c.c.	10.3 c.c	9.3 c.c
2.	" "	11.0 "	20.3 "	9.3 "
3.	" "	21.0 "	30.3 "	9.3 "
4.	" "	30.5 "	39.7 "	9.2 "

With the Unknown:-

S.No	Solution prepared taken in pipette	I reading of KMNO4 Solⁿ	II reading of KMNO4 Solⁿ	Difference
1.	10.0 c.c.	1.0 c.c.	9.6 c.c	8.6 "
2.	" "	10.0 "	18.6 "	8.6 "
3.	" "	11.0 "	27.6 "	8.6 "
4.	" "	28.0 "	36.7 "	8.7 "

Calculations :—

By the formula —

$$\text{Strength} = m \times 10 \times \frac{V_1}{V_2} \times 10. \quad \text{gms/litre}$$

$$\text{Strength} = 1.9586 \times 10 \times \frac{8.6}{9.3} \times 10 \quad \text{gms litre.}$$

$$= \frac{86 \times 19586}{9300} = \frac{1684396}{9300}$$

$$= 180.723$$

Result :—

The Strength of the given unknown — $FeSO_4(NH_4)_2SO_4 6H_2O$ Solution

$$= 180.723$$

Experiment No 16

Object:— To determine the Strength of given Solution using Pot. Thiosulphate Solution as an Medium Solution in gms/ litre.

① Wt of Weighing tube = 2.89 gms.
② " " + Substance = 3.1408 "
③ Again Weight (account) of tube = 2.8956.
∴ Wt of $K_2Cr_2O_7$ taken = .2452.

With Standard Solution:—

S.No	c.c of $K_2Cr_2O_7$ Solution.	I burette reading in c.c.	II burette reading in c.c.	c.c of thiosulphate taken.
1.	10.0 c.c.	1.0 c.c	10.6 c.c.	9.6 c.c
2.	"	11.0 "	20.6 "	9.6 "
3.	"	21.0 "	30.5 "	9.5 "

With Unknown Solution:—

S.No	c.c of $K_2Cr_2O_7$	I burette reading	II burette reading	c.c of Hypo taken
1.	10.0 c.c	1.0 c.c	11.2 c.c.	10.2 c.c.
	"	11.5 "		
2.	"	"	21.7 "	10.2 "
3.	" "	22.0 "	32.3 "	10.3 "

Calculations :—

Strength of $K_2Cr_2O_7$ solution prepared —

$$= \frac{N \times .2452 \times 10}{49.03} \text{ gms/litre.}$$

If N_2 is the strength of Hypo then —

$$\frac{N \times .2452}{4.903} \times 10 = N_2 \times 9.6$$

$$\therefore N_2 = \frac{N \times .2452 \times 10}{9.6 \times 4.903} \text{ gms/litre.}$$

Now if N_3 is the strength of given $K_2Cr_2O_7$ —
then —

$$\frac{N \times .2452 \times 10}{9.6 \times 4.903} \times 10.2 = N_3 \times 10$$

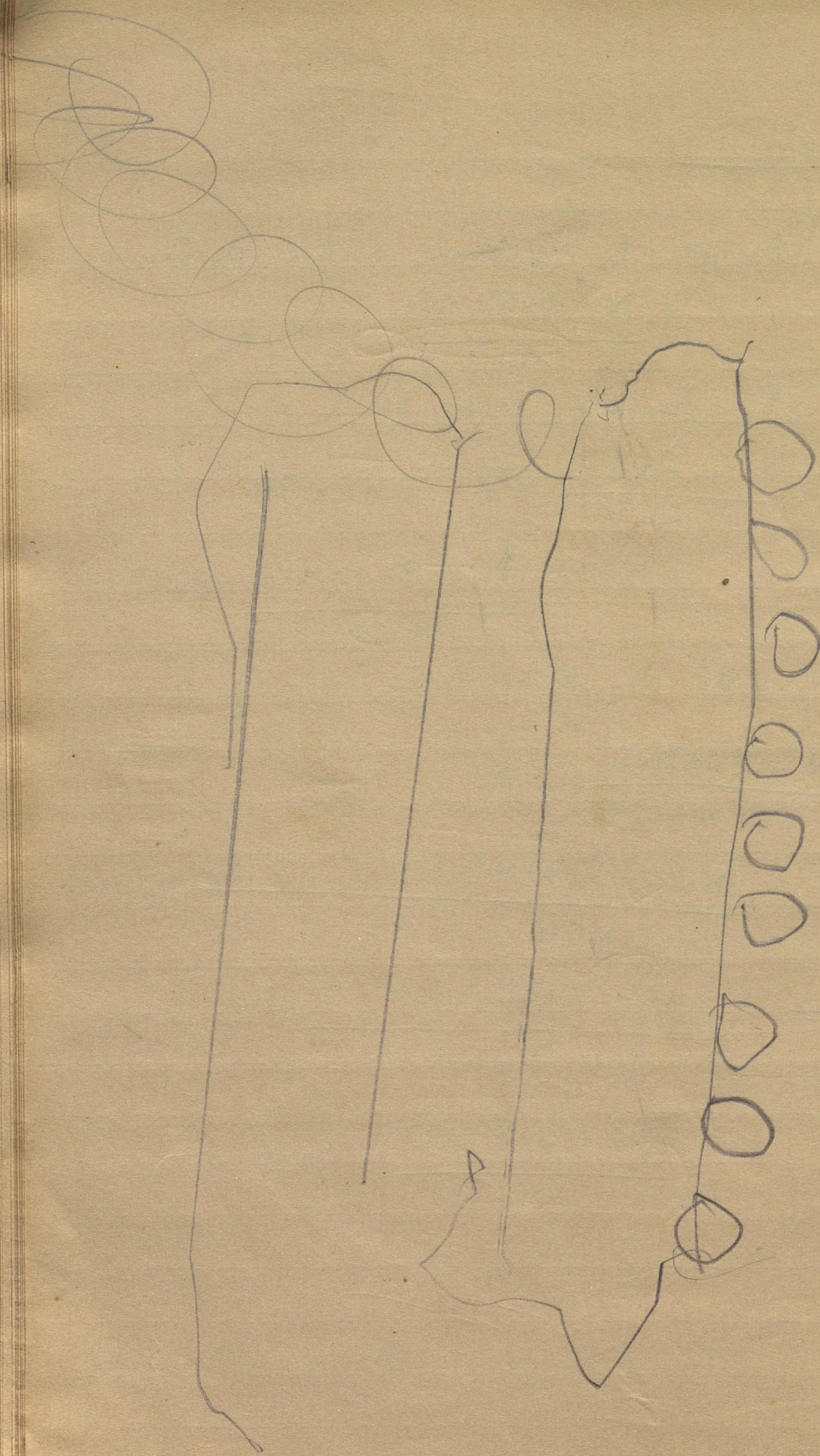
$$\therefore N_3 = \frac{N \times .2452 \times 10 \times 10.2 \times 10}{10 \times 9.6 \times 4.903} \text{ gms/litre.}$$

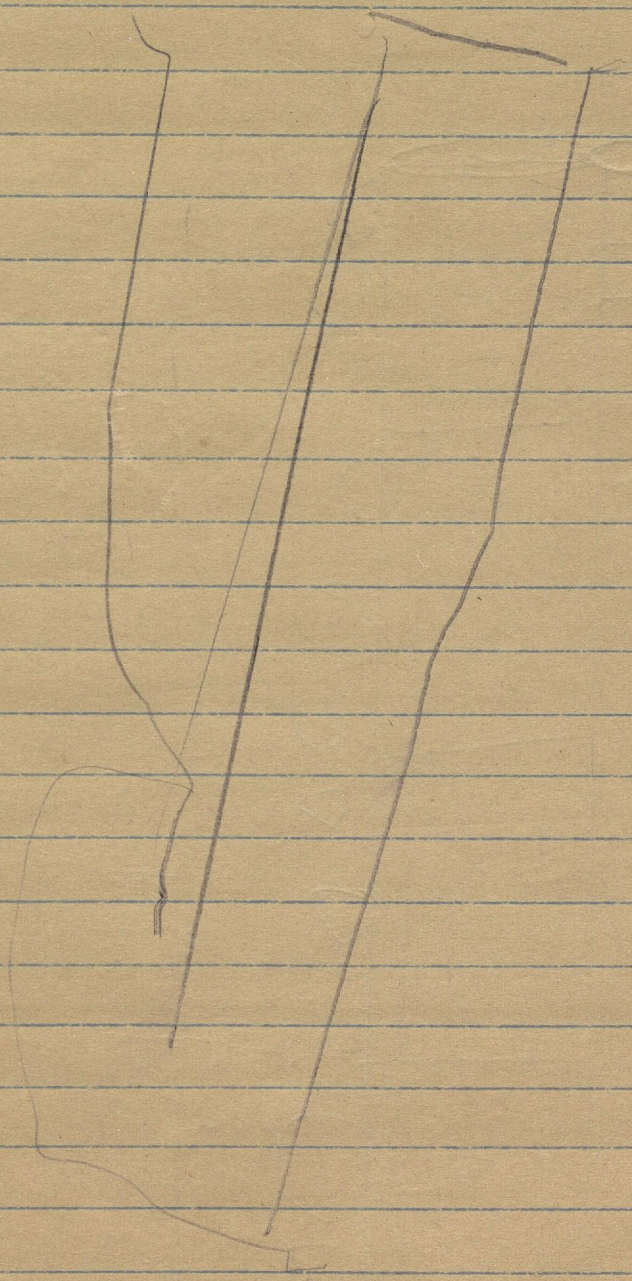
$$= \frac{49.03 \times .2452 \times 10 \times 10.2 \times 10}{10 \times 9.6 \times 4.903} \text{ gms/litre}$$

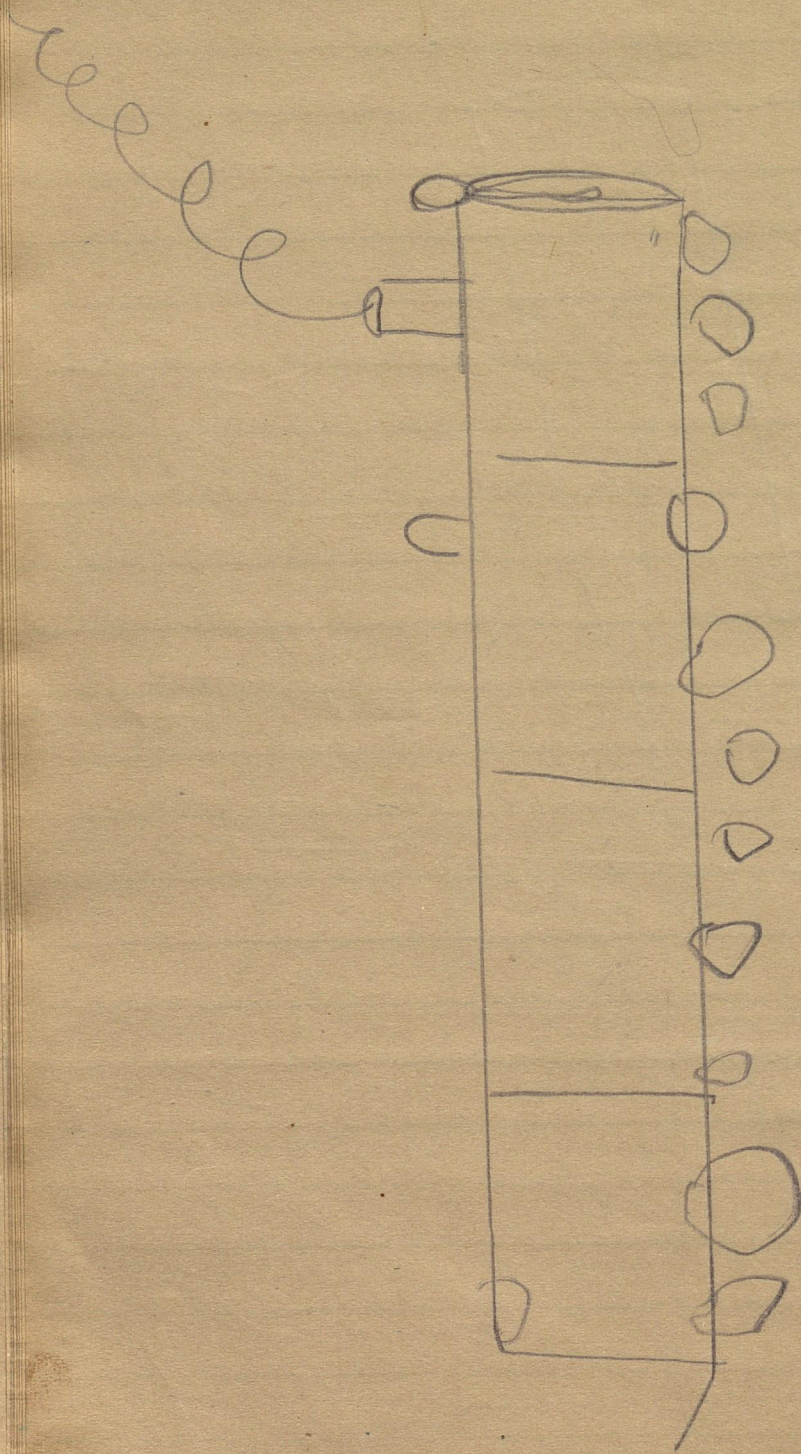
$$= \frac{12263.89512}{470.688} \text{ gms/litre}$$

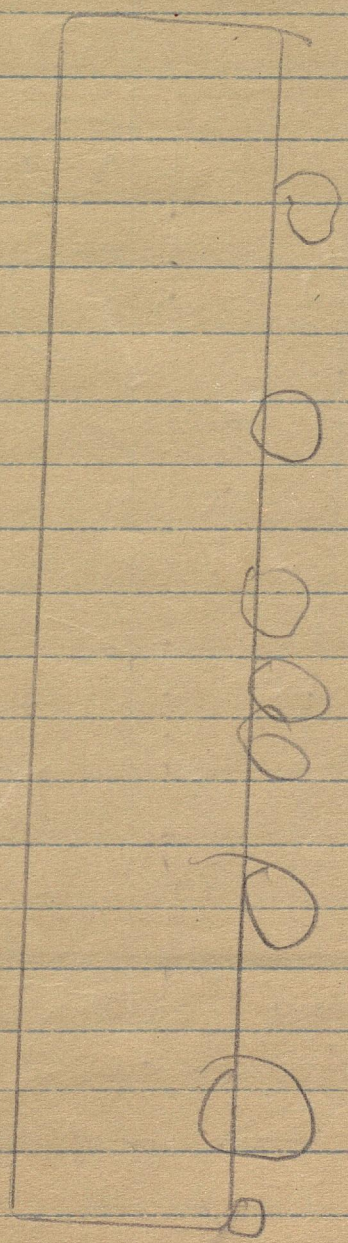
$$= 24.98$$

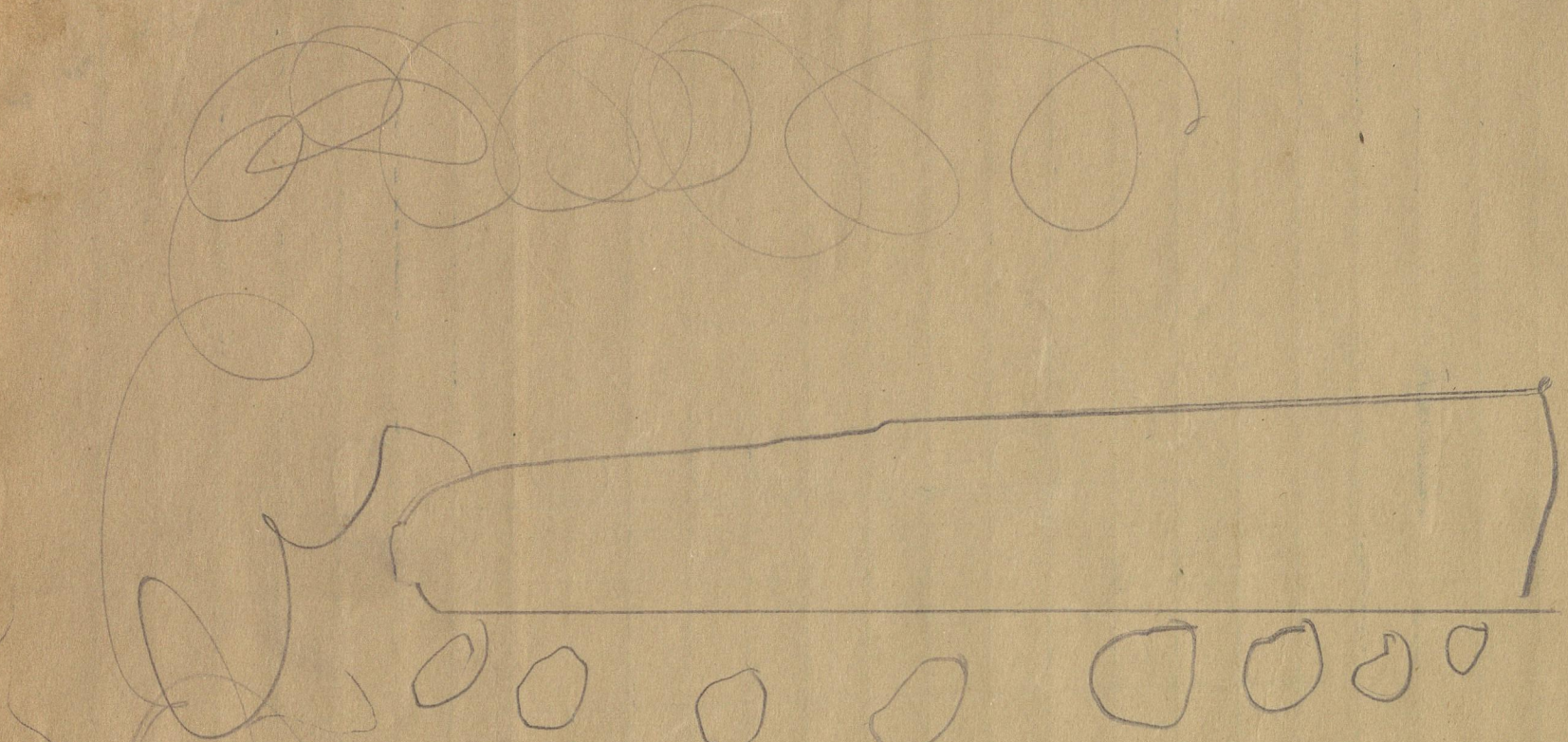
Result:- The strength of given $K_2Cr_2O_7$ Sol^n is
= 24.98 gms/litre.

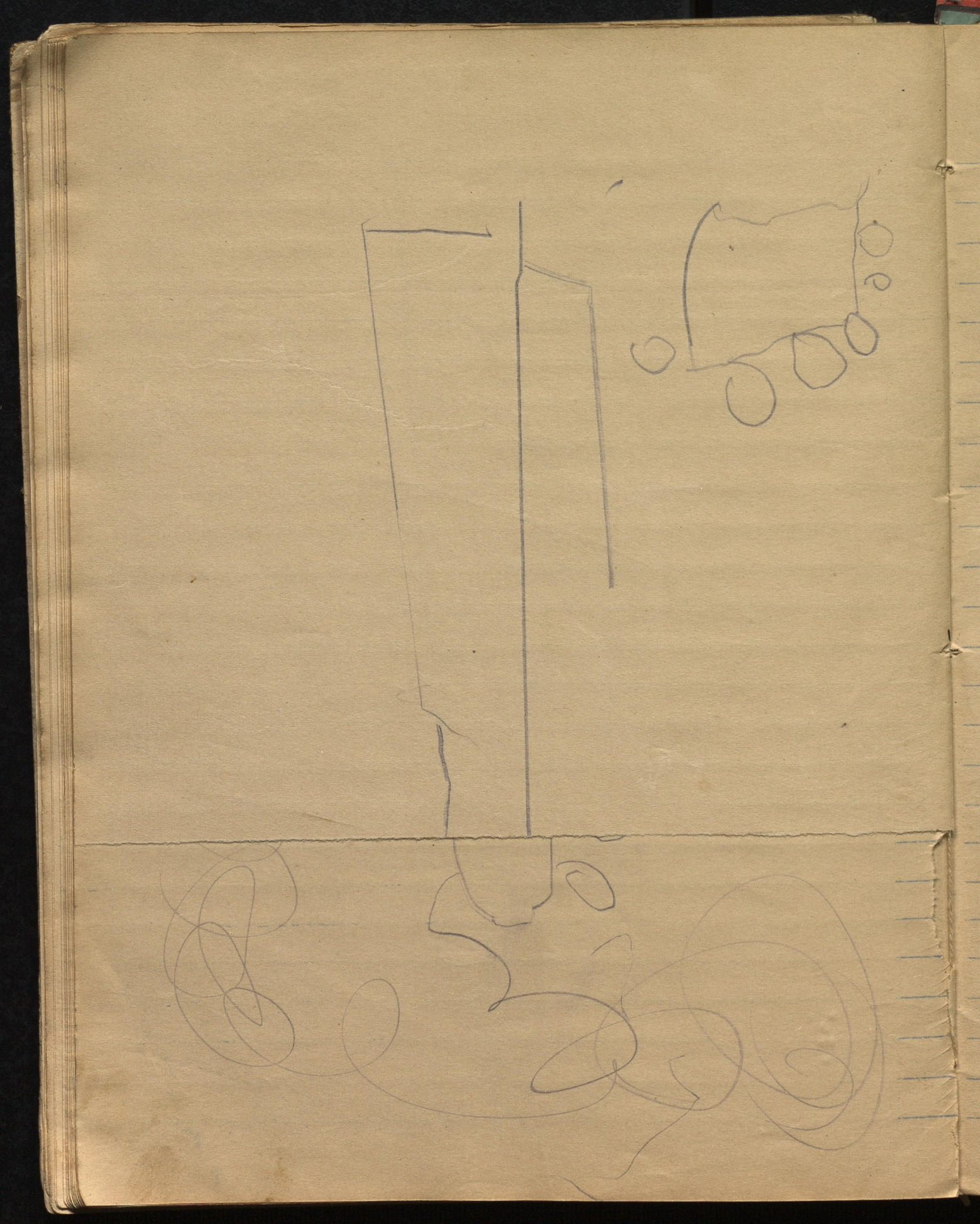












24/8

From

Dr. Krishna Bahadur

To Prof. A.I Oparin
Chairman of the Organising Committee
The Institute of Biochemistry
U.S.S.R Academy of Sciences
B. Kaluzskaya 33,
Moscow B-71

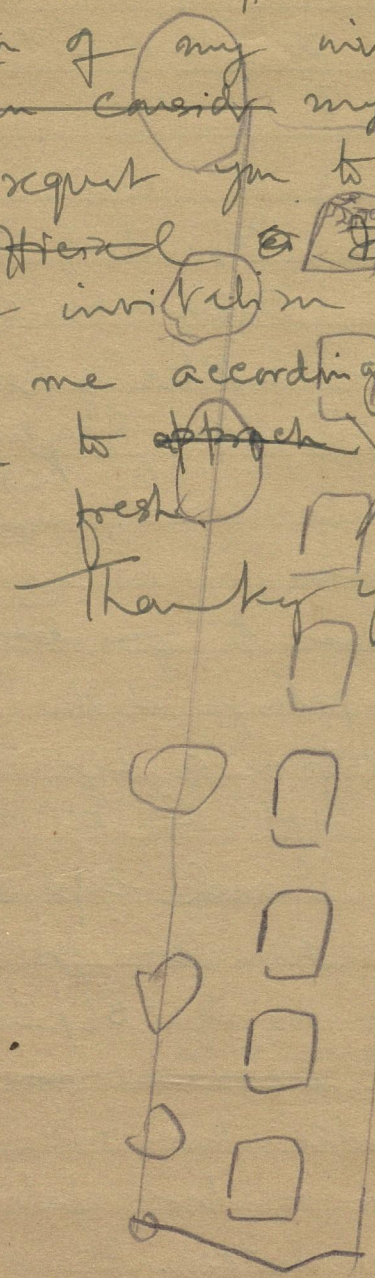
My Dear Prof Oparin,

With reference to your invitation of the 11th June '56 for participating in the "International Symposium on the origin of Life" to be held in Aug 1957 I applied to the Education Ministry for the travel expenses. But Deputy Educational Adviser Sri N.K. Sundaram in his letter No. D. 366/56. C.4, dated 20th August 1956 to me writes that "...Government of India has not received any official invitation to participate in the symposium referred in your letter. It is therefore regretted that it is not possible to comply with your request for travelling expenses."

Thus The our Indian Union educational ministry wants

that you should officially ~~invite~~ inform ~~them~~ them of my invitation before ~~they can consider~~ my application can be considered. I request you to ~~send them~~ and ~~offered~~ ~~[illegible]~~ information them officially of my invitation ~~[illegible]~~ intimate me accordingly so that I may be able to ~~approach~~ approach them a fresh.

Thanking you.



Fm

Dr. . . . .

- - - .

To

Professor Sidney W. Fox,
Director
Oceanographic Institute.
The Florida State University
Tallahassee,

Dear Prof. Sidney W. Fox,

Received your letter no SWF:akj dated August 13th 1956. There is a paper of mine in collaboration with my wife Dr. S. Ranganayaki in Comptes Rendus Paris 246, (1955). I am sorry I have no reprint of this paper. You may find it there, if you can. It may interest you.

~~We have recently observed the~~ I am glad to learn that ~~you are also interested in the sea~~ my idea possibility I hope some day we will have favourable circumstances to discuss the ~~conditions to discuss~~ together and work in collaboration.

I am very happy to know that you are arranging a symposium on

comparative Biochemistry in the next year. and I will ~~be g~~ very much like to ~~give~~ come to your place to attend this symposium and there ~~day~~ meet you to discuss these matters regarding sea-water.

~~Please~~ I will be thankful if you ~~keep~~ informed me ~~for before~~ about coming there in time so that I may be able to arrange my journey. This ~~[illegible]~~ I add because I am ~~thinking~~ considering of going to Moscow in August 1957 to attend the International Symposium in which I have been invited to participate, on the Origin of Life, ~~I hope the~~ ~~the Symposia will not fall~~

~~My wife Dr. S. Ranganayaki is also ~~[illegible]~~ a chemist, and she we met in the laboratory when she came to your research on the same problem on which I was working. and married.~~

Volumetric - Analysis

Date

.... Dec. 55 Object:-

We work together in the laboratory, to the coming [illegible] best wishes to you.

Yours sincerely,

24/8

~~From~~

~~D~~. 68, Dilkusha

New Katra

Allahabad

~~To~~

My dear Prof. ~~A.G.~~ Anna Gurwitch,

Received your letter of ~~28~~ 27th July '56. I am so happy that you hold almost similar view regarding the free radicals ~~o~~ as we hold. I am ~~[illegible]~~ preparing a paper for the symposium on origin of life in Moscow. Though I do not know whether I will be able to come and whether the paper will be accepted even in my absence but I am ~~[illegible]~~ proposing to send it soon to you. It will will be of great interest to you.

To day I received the negative reply from the Education Ministry of the Indian ~~[illegible]~~ Union about the travel expenses for the Moscow symposium. ~~in Mo~~ ~~of~~ on the ground that ~~they~~ the Indian Govt has ~~not~~ ~~been~~ not ~~[illegible]~~ been officially informed ~~of the~~ and invitation of ~~the about~~ the symposium.

I do not know why Prof. A.I. Oparin did not write to me or our Govt about the symposium & my invitation! It might have been helpful in getting the travel expenses from the Indian Govt.

I am extremely interested in the procedure suggested by your plant physiologist. I write for detecting the mitogenetic radiations by the measurement of oxidation of yeast cultures. I have been doing some work of my own & I will very much like to have a copy of the paper if you can spare.

With best wishes

Yours sincerely

23/8

To

Della Universita Di Napoli,

Prof. F. Cedrangolo,
Il Director
Istituto Di Chimica Biologica
Via
Naples

My dear Prof. F. Cedrangolo,

Received the reprint of your three papers you so kindly sent me. However I do not know Italian and I will have to wait some time before I can get it translated. I was expecting a letter also from you, hence my delay in thanking you.

I shall be glad to be of any service to you.

Yours sincerely

From 23/8

Dm . .

. . -

To Dr. C. Stapp.
Braunschweig,
Magnitorwall-5,
Deutschland.

My dear Dr. Stapp.

Received your letter of the 9th July '56, regarding the botanical name of the Dhar yeast and the inquiry whether it is a new species or a new variety.

Dhar yeast is a scum forming yeast with mild fermenting properties. It is usually a nonsporogenous yeast but under special conditions only forms ascospores with only one round flattened ascospore per ascus. Thus it belongs to the family Saccharomycetaceae. Very rarely it forms a pseudomycelium. Because of the shape and number of the ascospores and the feeble tendency of the

mycelium formation it can
be classified in the genus Pichia.
This, however, does not resemble any
known species of Pichia. The only species
of Pichia with which it shows some
resemblance is
P. membranaefaciens. But it
can not be considered as a
variety of P. membranaefaciens because of
the following reasons.
(i) It has a round flatten ascospore
in each asci.
(ii) It does not show asporous stage
normally.
(iii) Formation of Pseudomycelium is very rare.
(iv) It indicates nitrogen fixing property.
(v) It ferments sucrose, glucose, and
maltose. It can utilize
ethyl alcohol as the source of
Carbon.

Thus the Dhar yeast differs from
Pichia membranaefaciens, Hansen described
by Hansen (2,3) and Siefert (4)

in the shape ~~of~~ and number of ascospores and in fermenting sucrose and ~~glucose~~ utilising ethyl alcohol as the source of carbon.

~~The~~ Dhar yeast also differs from ~~with~~ Pichia membranaefaciens II and III Pichi described by Pichi (5) ~~and~~ in the form and number of ascospores.

~~Thus~~ Thus Dhar Yeast can be ~~given~~ classified as a new species under the ~~genera~~ genus Pichia of the family Saccharomycetaceae (5) and I propose that it may be named as *Pichia indicus*.

~~If~~ I ~~request~~ authorise you to include the ~~relevant~~ necessary matter of this letter in the paper ~~you~~ I sent and publish the paper.

With best wishes

Yours sincerely

K.

The Yeast,

(1) A. Guilliermond, Trans. by F.W. Tanner, John Wiley and Sons Ltd, 276 (1920).

(2) E.C. Hansen, Comp. Rend. ~~tab~~ du. lab. de Carlsberg, 2, Book 5, (1888).

(3) E.C. Hansen, Comp. Rend. du lab. de Carlsberg, 5, Book 2, (1902).

(4) J.C. Nielsen, Comp. Rend. du lab. de Carlsberg, 3, Book, 31, (1891).

(5) P. Pichi, Ann della R. Scuola di viticoltura e di Enologia in Conegliano, 1, (1892).

(6) A. Guilliermond, The Yeast Trans. by F.W. Tanner, John Wiley and Sons Ltd., 197 (1920).

Seifert, W., Saccharomyces membranaefaciens Ber. d. chem. Phys. Versuchsst. Klosterneuburg, 1899-1900.

From

Dr. . . .
. . .
. . .

To

The Chief ~~the~~ Editor
of Nature
~~Machmill~~ ~~Mac~~ Macmillan & Co Ltd,
St. Martin's Street
London, W.C.2.

Dear Sir,

In October 1954 I send you a paper for publication ~~initialled~~ ~~named~~ entitled "Photosynthesis of amino acids from paraformaldehyde involving the fixation of nitrogen in presence of colloidal molybdenum oxide as colloid.

In ~~the the 4th~~ your letter ~~no.~~ no. AG/DH, dated 4th October 1954 ~~I received your~~ I you acknowledged the ~~receipt~~ receipt of the paper and said that you will consider the paper for publication.

~~On the the 9th Nov~~ Again in your letter of the 9th Nov 1954 ~~dated~~ ~~and~~ no. AG/DH. you made a few inquiries ~~regard~~ about the procedure ~~of~~ of ~~for~~ making the ~~ammonium~~ molybdenum oxide and if ~~whether~~ there ~~the~~ was ~~any~~ no free ammonia in the atmosphere near about.

We wrote to you on the 19th Nov 1954 a letter replying to the queries.

But after all that I got back my paper together with my letter of the 19th Nov. 1954 without any covering letter.

I made general inquiries without result. Now after waiting for a reasonably long time I am sending all the letters & paper to you so that it may help you to understand the case.

I very much like to know whether you did not consider the paper fit for publication or it was returned to me by some mistake of the office.

After you complete all your inquiries and if you find it not possible to publish the paper please send them to me and oblige.

Yours sincerely

~~Leader~~ Adrolim - DA 250 (G),

From Kapoor

27 ~~Aug~~. 48.

Cancelled.

My dear ~~Dada~~ Verendra ~~Dada~~,

Rangam is apply for a foreign scholarship. The application is to be given ~~to~~ the director of Education U.P.. She is 1st class High School, 1st class Intermediate ~~with and stood 1st in~~ Annamalai Univ., and got II class with 57% marks in B.Sc. (Honours). She got her M.A. in chemistry from Annamalai Univ. She got her D. Phil from Allld. in 1945. She has published ~~6~~ papers, five in foreign countries. All these are attached with her application.

~~Please~~ She is extremely anxious to get it. Though I do not know how she will manage to go to foreign country alone still she is too much for it. Please do whatever possible in the matter.

3/9/56.

From

Dr. . . . .

. . .

To

The Secretary
Academia Sinica,
Peking, China.

Dear Sir,

I sent you ~~to~~ my two scientific papers for publication in your Journal in April 1956 but so far I have not heard any thing about them. ~~Registered letters was post service~~ ~~for my country~~ ~~was cancelled~~ at that time and I was ~~forced to send them~~

I am eargerly waiting for the aknowledgement of the papers. Please let me know if you have got those papers.

Yours sincerely,

K.

15/9/56.

To

The Editor "Experimentia"
Birkhauser Ltd.
Basle-10-
(Switzerland)
Elisabethenstr-15

Dear Sir,

We are herewith sending you our paper "A study of the growth of the yeast utilising the energy released by the oxidation of several metals" for the publication in your journal. We shall be thankful if you publish it in your journal and oblige.

Yours ...

K.

Letter to Dr.

Prof. R. H. S. Thompson
Depart. of Chemical Pathology,
Guy's for financial and
help for going to Moscow
12/9/56

Received a reply in Sept 1956.

30/9/56.

Dear Sir,

I require ~~the~~ cultures of the following organisms ~~employed~~ in connection with studies in ~~my~~ laboratory on Acetone-Butanol & and 2,3, butanediol fermentation. I shall be very thankful if you ~~let us~~ can send some of them. In case we have to pay some money as the cost of the cultures please let us know how much we will have to pay for them.

- ✓ Clostridium acetobutylicum (Weizmann)
- ✓ Clostridium pasteurianum,
- ✓ Clostridium butylicum
- ~~Aero~~bacillus polymyxa, (Aeromonas hydrophila)
- ✓ Aeromonas hydrophila,
- ✓ Bacillus subtilis
- ✓ Serratia marcesens.

Aerobacter pectinovorum

Or any other ~~varies of~~ organism producing high yield of n-butanol and 2,3, butanediol.

III To. Collection centre
Lausanne 20/11

I will be extremely thankful if you help me in this collection or direct me to the proper place where I can receive some help regarding this.
I shall be very much obliged if you send an early reply.

Thanking you
Yours Sincerely

To Agriculture Research Institution.
Dr ~~Jynferd~~ J. Wickerham, Received reply [illegible] a. Haynes. William
Wilhelm Uecker
~~Albert~~ Hansen,
Dr Rudolf Muller
C. Stapp.

I After words written to the Director
Indian Agricultural Research Institute
PUSA, 25/10/50.
New Delhi

II Director
SCHIMMEL CULTURES
BAARN 28/11
HOLLAND

III Culture Centre
National Chemical Laboratory
29/10 Poona

1/10/56.

My dear Professor.

There was a meeting on the 27th of the Research Committee attended by the Dean and the heads in which the Vice. chancellor has considered my thesis reports. As the new statutes are now enforced the Vice-Chancellor said that he wants to consider the reports in the light of the new rules. (When the reports should be considered as per the new rules)

Prof. Mayrback's report was not clear so they have referred the reports back to Prof. Mayrback for his definite opinion. All this I came to know after the decision was taken.

My thesis is still with Prof. Mayrback so an air-mail letter has been sent to him to send his opinion clearly.

I feel very sad. As if all sorts of troubles are sent only for me.

दांत पीसता है।

~~Hang~~ I feel ~~to~~ it ~~a matter~~ ~~of~~ ~~lay~~ ~~a~~ necessary to inform you of this as soon as possible. ~~to~~ ~~I am sending~~.

If you think it proper to write to Mayor back you please do it.
Rest in mercy

Yours ~~Ob~~ Obediently

Address:

To the Incharge of Navigation
at the Port Said.
To be given to the Captain
of the Ship S.S. Batory, to at 5th Oct 1957.
pass thro' the port in near ~~future~~.

For. Prof. N. R. Dhar.

\+ Port Said. (Egypt).

To ~~the~~ Inchg of Navigation
at the Port ~~Aden~~. ADEN
To be given to The Ship S.S. Batory
to pass thro' the port ~~in rea~~ near ~~or~~ abt 7th
For Prof

3/10/56.

My dear Prof. Subrahmanayam,

I ~~received the massage~~ came to know through Prof. Dr. S. Ghosh that you ~~want~~ would like to have our papers on P. membranifaciens. I am sending you a few papers on this yeast. A few of those ~~papers~~ are joint papers by Dr. Mrs. S. Ranganayaki, is my wife and daughter of Prof. A.C. Subrahmanayam of Engl. Dept. of Annamalai Univ. ~~has published one paper on this yeast separately. I am sending you that too.~~

I have heard much about you ~~much~~ through my father-in-law. ~~and I~~ had a great desire to come in contact with you. I am very happy to get this chance.

At ~~hope~~ present I am working on fermentology, Enzymic reactions, microbial mineral intake and photosynthesis of amino acids ~~on~~ with a little ~~to~~ groups of research ~~group~~ scholars.

I ~~think it~~ will be happy to ~~to~~ have a ~~scientific contact~~ exchange of views with you. ~~I~~ and hope this ~~with~~ letter will be ~~an~~ a begining of a ~~warm~~ warm and strong scientific contact ~~not~~ between us.

With best regards

Yours sincerely

K.

I Ag   5.10.56.

		I em.	II em.	cm.		Total run. cm.
	? Ag	·6	·25 ·75	2·1	·71 Ph.	
Mixed solid family. Mno.	0·2	·8				2·95
Mn. D.	·499	1·9	2·75		·71 Ph.	3·85
	Poo. Hi					
I	·435	1·35	Al. glu.	2·15	·693 Ty.	3·1
I	·437	1·4	Th.	1·85	·578 Ty.	3·2
II	·399	1·4	Se	2·05	·576 Ty.	3·55
II	·32	·8	Arg.	1·45	·58 Ty.	2·5

·71 / 2·95 — 295) 2100 (·7 … 2065 / 350

·6 / 2·95) 600 (·20 — 590 / 100

·75 / 2·95) 750 (·25 — 590 / 1600 / 1475 / 1250

·42 — 3·2) 1·40 (— 128 / 120 / 64 / 560 / 240

310) 1350 (·435 — 1240 / 1100 / 930 / 1700

310) 2150 (·693 — 1860 / 2900 / 2790 / 1100

·49 — 385) 1900 (— 1540 / 3600 / 3080 / 3465

·578 — 320) 1·850 (— 1600 / 2500 / 2240 / 2600 / 2560

205) 3550 (

·576 — 355) 2050 (— 1775 / 2750 / 2485 / 265

·58 — 250) 1450 (— 1250 / 2000

·71 — 385) 2750 (— 2695 / 550

·32 — 2·5) ·80 (— 75 / 1·45

·394 — 355) 1400 (— 1065 / 3350 / 3195 / 1650

11/10/ —

Light → Aspartic a, Histidine, Phenylalanine

Norleucine

1st year on 29th January.

I am sending herewith the paper & you to proceed with the work related to its publication. Your observation that if molybdenum oxide is employed as catalyst aromatic amino acids are formed in a mixture of paraformaldehyde & KNO_3. (I have made a similar observation). I hope our observation will produce still more interesting & important observation in near future.

Rangam is happy to read the small note you sent to both of us jointly. I hope she will reply personally to you.

With best wishes and hoping to hear from you in near future.

Yours Sincerely

K.

She is very much interested in knowing when you are going to marry. I have to add that I have not yet got your good photograph. I am still waiting for the occasion when you fulfill your promise. How is your health. I have not heard anything about him since long.

Received your letter and the paper you
you sent me. First I must thank you for the
New Year card. ~~you sent~~ We liked it very
much. I too wish you a happy new year.
We are ~~was~~ very ~~pleased me very much~~ happy to
learn that you have confirmed our ~~my~~ findings.
The paper you sent is almost correct
but for a few type mistakes which have
been corrected. ~~I~~ We have no objection
in giving ~~thanking~~ due acknowledgement to
Dr. Bianco for her services ~~work~~ in this piece of work ~~problem~~. ~~We~~ You
certainly ~~may~~ well add a note of
acknowledgement in the paper.
We have no objection even if you
~~think it~~ propose to include her
name amongst the authors. Of course you
~~I will like you to~~ are the
best judge of her services & devotion
for the work.

~~I once again~~ thank you for
the congratulation you send for the
first birth day celebration of our little
master. We have named him
CHANDRAN, thus by meaning moon. He will complete his

University of Allahabad

DEPARTMENT OF CHEMISTRY

From

Dr. Krishna Bahadur
M.Sc., D.Phil., D.Sc.,
Chemistry Department
Allahabad University,
Allahabad (INDIA)

My dear Prof. Fearon,

Thank you very much for ~~your~~ properly directing ~~my~~ the paper I sent you. I shall be thankful if I can do something for you.

Thanking you once more,

Yours sincerely

Krishna Bahadur

14.12.56.

Thank you very much for your suggestions about the proper journals for my papers. I shall be glad ~~to be of some service to you~~ if if I can be ~~do something for~~ of any service to you too.

From,

Dr. Krishna Bahadur
M. Sc., D. Phil., F.,
Lecturer,
Chemistry Department,
University of Allahabad,
Allahabad.

To

The Vice-Chancellor,
University of Allahabad,
Allahabad.

Through,

The Head
Chemistry Department
University of Allahabad
Allahabad.

Sir,

Respectfully I beg to state that I received my D. Sc. degree from this university in the convocation of 1956. I am working as a lecturer in the Chemistry Department of this university since the last six and a half years and at present I am drawing a salary of Rs. 420/= p.m. I request you to grant me a few increments as a recognition of my academic success. This will not only encourage me but will also prove to be a great impetus to my colleagues for ~~pushing~~ pursuing further research.

I may be permitted to quote one precedence of this type when Dr. K. C. Sen, who was a member of the staff of the Chemistry Department was awarded D. Sc. degree and Mahamahopathya Sir Dr. Ganga Nath Jha gave him an increment of Rs 50/= p. m.

I, therefore, request you to consider my application favourably and award me a few increments.

Yours Obediently
Krishna Bahadur

14th Dec '56.

7/12/56.

From

Dr. K.

To

Prof. A. E Oparin

Dear Sir,

Thank you very much for your letter of the 9th Nov. '56. I am glad to know that you read my paper with interest. I have a great desire to come to meet you all during the Symposium. Hitherto I have so far not heard anything from Prof. Thompson, Secretary, International Union of Biochemistry, about the financial help I seek for coming over to Moscow to participate in the Symposium. If you do not consider it much out of place please do you too write to Prof. R.H.S. Thompson, Department of Chemical Pathology, Guy's hospital Medical ~~College~~ School, London, S.E.1. (England) to grant me some money to expedite the official decision

Thanking You yours Sincerely

K.

University of Allahabad

DEPARTMENT OF CHEMISTRY

From

Dr. Krishna Bahadur.
Chemistry Department,
Allahabad University
Allahabad.

7/12/56

To

Prof. R. H. S. Thompson
General Secretary
International Union of Biochemistry
Department of Chemical Pathology,
Guy's Hospital Medical School,
London, S.E.1.
(England).

Dear Sir,

With reference to your letter of 19th Sept. '56 I wish to remind you that I have not heard any thing from you regarding the financial support from the International Union of Biochemistry in connection with my part in the symposium on the Origin of Life, for which I applied to the Hon [illegible] you [illegible] as per reply from [illegible] 15th Sept. Prof. Florkin and Prof. Stotz. I am a bit impatient because I have to apply for the pass-port, leave and other formalities, which take several months, before I can leave the country.

Hoping an early reply.

Yours.

University of Allahabad

DEPARTMENT OF CHEMISTRY

From,

Dr. Krishna Bahadur,
Chemistry Department,
Allahabad University,
68, Dilkusha,
New Katra,
Allahabad (India)

To

Prof. Dr. A. I. Oparin,
Chairman of the Organising Committee,
The Institute of Biochemistry
USSR Academy of Sciences,
B. Kakuzskaya. 33.
Moscow B-75

My dear Professor Oparin,

In connection with your letter dated 11th June 1956, regarding the International Symposium, I am sending you my communication, "The reactions involved in the formation of compounds preliminary to the synthesis of protoplasm and other ~~materials~~ compounds of biological importance."

30.th Sept 1956. K

Schorp mullr 24 - 8 - 56.

replied on 31st. Aug '56

Received your letter dated

- - - - . . & have to say

that you may continue ~~the~~

both the paper into one and

publish it ~~the journal~~ in '

- - - - - - - - - '

" Zeitschrift für Lebensmittel

-Untersuchung und Forschung"

Thanking you

Yours faithfully

Seshadri,

I agree ~~that~~ with Dr. Kiermeier of Weihenstephan to publish one combined paper with him. I authorise him to make one manuscript get it translated and publish it in your journal.

I will be extremely thankful for this.

From. Dr. S. Ranganayaki

To

The Secretary
Scientific Research Committee,
24-A; Chatham Lines
Allahabad

5/10/56

Dear Sir, With reference to your advertisement in the Leader, I am herewith sending you my application for the post of research assistant for the fermentation researches in Allahabad University on "Synthetic Rubber Scheme". Copies of some of my publications are also enclosed.

Hoping for a favourable consideration of my application.

Yours faithfully

2 80

From.

Dr (Mrs). S. Ranganayaki

To

The Secretary
Crosthwaite Girls College.
Allahabad

Through

The Principal.
C.G.C.
Alld.

Dear Sir,

I have worked as ~~the~~ a permanent lecturer in C.G.C. since 1950 – 1955. As now I am no more on the staff I want my provident fund.

I therefore request you to kindly pay my provident fund and oblige.

Yours faithfully

S. R.

8/12/56

Fm

K.

T.

Ram Narain Lal
Publisher, ~~Allahad~~.
Allahad

Dear Sir,

Recd yr accts chart for my book Kriyatmak Rasayan dated 12th Oct. 1956. However I was surprised to note (that you have mentioned) an advance of Rs. 600/- in my name for the book. I have taken no such advance and I hope you will check yr accts and correct them if it.

I have an advance of Rs 200/- in my book "[illegible]" published by you about three years back. I am sorry I have not received

~~the~~ that mayic chp

any account of ~~that~~ book
~~[illegible]~~ so far. I hope you will
do ~~[illegible]~~ the account of that
book ~~[illegible]~~ also, ~~and~~ ~~[illegible]~~ ~~[illegible]~~ and oblige

~~Have I wrote a book~~
Y. Thanking you
~~See next~~
Yours faithfully

is all
and that ~~is all~~ ~~[illegible]~~ the
advance that I have
ever taken from you
and that was four
years back when
this particular book
was not ever written.

∴ I wrote a book on Modern Hinduism for you in Hindi on a contract of Rs 300/-. You paid only 150/- saying that the remaining sum will be paid after publication. I do not see ~~[illegible]~~ any sense ~~[illegible]~~ in waiting for the payment if you decide to publish the book after a decay.

17/10/56.

To

Dr. C. Stapp.
Braunschevieg
Nagnitorwall-5,
Deutschland.

Dear Sir,

Thank you very much for a letter dated 19th Sept. 1956. I think your suggestion Pichia indica as the name is all right. I also accept it.

I am very sorry for the mistake in the manuscript (you pointed out). It was a great blunder done while copying. A differ reference was copied. The correct refree for the (4) ne Siefert shald be

Siefert, W. Saccharomyces membranaefaciens. Ber. d. chem. Phys. Versuchsst. Plosterinburg, 1899-1900

You please make this correction in the manuscript.

I am ever thankful for your pointing out the mistake.

Thanking you yours sincerely

K.

~~Italy~~

18/10/56.

		Ref.		Valin
Total	8·2 →	·67	—	·61
	5·5			
	4·8 —	·59	—	~~Tyrosine~~ Histidin
Dark Tan Mrst. ——	4·1 —	·50	—	·53
——	3·5 —	·43	—	·46 Alanin
	2·8 —	·34	—	·37 Glycin
	1·7 —	·20.	—	·28 — Asparagin
			—	·16
				↓
				Ornithin

8·2) 5·50 (·67
4 9 2
5 8 0
5 7 4

8·2) 4·80 (·58
4 1 0
7 0 0
6 5 6
4 4 0

Asptic, Glycin.

8·2) 410 (·50
410
x

~~8·2) 3·50 (·42~~
3 2 8
2 2 0
1 6 4
5 6

82) 280 (·34
2 4 6
3 4 0

8·2) 1·70 (·20
1 6 4
6 0

{ Valin, Histidin, Tyrosin,
Alanin, Glycin, asptic a., Glutamic a,
~~Ornithin~~.

~~Sea~~ Time
100 drop.

	Rf	
7·6		
6·5 —	·85 —	?
5·4 —	·71 —	Thyptophan
~~4·3~~		
✓ 3·9 —	·51 —	H,
✓ 3·2 —	·42 —	Al, Gly, Asp
2 —	·26.	Ornithin

76) 650 (85
6 0 8
4 2 0

·71
~~76) 5·40~~
5 3 2

·51
76) 3 9 0
3 8 0
1 0 0

·42
76) 3 2 0
~~2 2 8~~
9 2
3 0 4
1 6 0

·26
76) 2 0 0
1 5 2
4 8 0

To

The Head
Zoology Dept.
A.U.

Sir,

I have come to know that the Senior Research Scholarship of the central Government which was given to Mrs' Sakuntala Mittal has fallen vacant. She ~~has given~~ was drawing this scholarship and has submitted an ~~written~~ application requesting that she does not need the scholarship any more.

I request you to give this scholarship to me. As regards my qualifications I ~~an~~ passed my High School, Intermediate, ~~an~~ B.Sc. and M.Sc. all in second class and I am doing research on the problem of "Comparative Study of the Kidneys of Teleosts" in the Zoology Dept. under Dr. S.K. Dutta since July 1956.

I request you to give me this ~~the above post~~ scholarship and oblige.

Yours ~~faith~~ obediently

S. Rajan.

Zoology Dept.
A.U. Date

25/10/56. O discarded and the above layer is ~~taken~~ used as solvent.

68 Dilkusha
New Katra
Allahabad.

~~From~~

My dear Dr. Santamaria,

~~(?)~~ Received your letter of 6th Oct. 1956 and ~~(?)~~ the solution you sent by air mail. We detected two very clear rings of glycine + alanine but faint rings — yet distinct of Valine, histidine, glutamic acid, aspartic acid, and ornithine were also detected. There is nothing special about our method of detection of amino acids. We use n-butanol-acetic acid-water (40% : 10% : 50%) mixture ~~(?)~~ as running solvent. The mixture is thoroughly shaken in a separating funnel and allowed to stand for two days. The lower aqueous layer is then O. ~~And~~ In paper chromatography we use whatman filter paper no 1. We run the solvent to about 8 cm radius. We ~~(?)~~ have however experienced that after ~~(?)~~ spray ninhydrin dissolved in acetone heating helps in ~~(?)~~ developing the faint amino acid rings. the filter paper ~~-- cutting the~~ on electric ~~(?)~~ heater. We employed 100 drops each time for ~~the~~ testing the solution you sent.

~~(?)~~ However we ~~definitely~~ have no objection if you ~~(?)~~ wish to hold that only glycine + alanine are formed — they are certainly in much more quantity than other amino acids.

For the same catalyst the formation of amino acid ~~(?)~~ will depend on the pH of the medium ~~(?)~~ (it is well known that the pH of the solution containing molybdenum oxide colloid varies with time ~~(?)~~ due to differential ionic shutting ~~(?) ions of water~~ for hydr...), the concentration of the colloid employed,

The ~~composition~~ nature of the glass of the flask in which mixture was kept during exposure (as it cuts of different wave lengths of irradiation), the material of the glass of the ~~bulb~~ electric bulb, ~~the~~ and the metal of the bulb emitting the radiations. So there is nothing surprising if different amino acids are synthesised in different experiments when all these factors were not controlled. ~~However I have~~ We ~~should~~ 'll will investigate these factors afterwards. At least this is established that amino acids are formed when a mixture of paraformaldehyde of molybdenum oxide & water is exposed to ~~artificial~~ light. This is an extremely ~~interesting~~ important finding because it will explains ~~the~~ a method of nitrogen fixation. There is every possibility that paraformaldehyde can be replaced by ~~and~~ Agriculturists will be interested in it because it explains how the residual carbonaceous compounds of plant roots which are left in the soil help the soil in fixing atmospheric nitrogen photochemically on exposure to light. Oceanographic researches will ~~explain~~ be interested ~~in~~ because it tells the possibility of nitrogen fixation in sea water ~~as~~ in the form of amino acids;

natural influence plant + animal life
which much to affect the flora + flora of
of the sea. This discovery is just a beginning of
a new branch of study in the
knowledge. and We will in this mutual
collaboration investigation investigate other
catalysts which may prove even better than
molybdenum and thus it is quite
possible we may be able to achieve
this of nitrogen fixation even economically.
Gases of carbon other than
formaldehyde can also be used. But
this is all the work of future.

At present let us send
a paper mentioning our discovery on this topic in the beginning.
We have sent a paper to you. If
you wish to change
the style of the paper we have no
objection + you can draft a new one
on those lines. If you want to
keep the old one with due correction
you introduce your name among the
authors. Then where the name
of the amino acids detected are mentioned
you keep only glycine + alanine among.
The detected acids and if you think it necessary introduce

from nitrogen other/organic compds.

I have the following suggestions.

a little more about the experimental details ~~if you think it necessary~~ and get the paper published in some standard journal of your side. I propose the Comptus Rendus (France) however if you select any other then We have no objection.

Do not forget to write a note in the end of the paper that the work has been done both in Allahabad University laboratory & your laboratory. This will help in establishing the authenticity of this work.

~~However I do not~~ I have much to write to you but I think this has already occupied enough space. We will discuss about this and other things & ourselves afterwards. I am very much interested in the other catalysts. Please write also the your results. With my best regards.

Yours Sincerely

K

24/10/86.

To

~~My~~

My dear Respected Prof. N. R. Dhar,

I am the sister of your pupil Dr. (Mrs) S Ranganayaki and I am doing research in Zoology Department under ~~Dr~~ Dr. S.K. Dutta. I ~~am~~ have received no scholarship so far and I ~~to my~~ very much ~~financial conditions are~~ need a scholarship. ~~for my [illegible]~~ I ~~will~~ request you to kindly ~~influence~~ help me ~~exert your influence~~ to ~~&~~ ~~procure~~ get a scholarship ~~for me~~.

I shall be ever thankful for your this help.

Yours obediently
Rajam

For $-C\equiv N$, $-SO_3^-$, $-CHO$, $-CO-CH_3$, $-COOH$, $-COOCH_3$, $-CO-NH_2$, $-NH_3^+$, $-NHCOCH_3$

Dr.

not dispatched

To

10/11/56.

Sidney W. Fox.
Director
Oceanographic Institute
Florida State University
Tallahassee, Florida.

My dear Prof. S.W. Fox.,

Received your card of 28th. Aug '56, for a ~~copy~~ reprint of my paper in Comp. rend. 240, 246-8 (1955). I am sorry I do not have a single reprint of the paper with me and I can not send you one. I ~~was [illegible]~~ did not get a ~~single reprint from them inspite of my request for the same~~. If you are very much interested I can send you a copy of the paper.

How-ever I have got some very interesting results on the photosynthesis of amino acid. ~~[illegible]~~ These results ~~particularly of [illegible] the type that [illegible] which [illegible]~~ will yield very ~~[illegible] and~~ interesting ~~& important~~ results ~~when [illegible]~~ investigated with oceanographic point of view.

I ~~[illegible]~~ observed that of a sterilised mixture of paraformaldehyde, ~~[illegible]~~ molybdenum oxide & water ~~mixture~~ is exposed to ~~[illegible]~~ artificial electric light from a ~~[illegible]~~ 500 watts bulb a number of amino acid are synthesised in the mixture out of which Glycine, and alanine ~~are found in largest quantity~~ have been identified & confirmed. This work was also confirmed by Prof. Dr. ~~[illegible]~~ Leonida Santamaria

of Italy. ~~also~~ ~~[illegible]~~ ~~I approached~~ I wrote to him for ~~it~~ ~~and~~ repeating
the experiment to establish ~~the~~ and confirm the
finding ~~without~~ beyond any doubt. ~~The~~ In this
photosynthesis of amino acid, atmospheric nitrogen
is fixed. This work will soon be published
and I will send you the reprint as soon as
I get one.

I pushed this work still further. I have
observed that ~~[illegible]~~ in the above experiment
paraformaldehyde can be excluded if the
aqueous mixture contains ~~a~~ ~~little~~ dissolved
CO_2. I am sending you a ~~a~~ ~~described~~
description of this experiment. ~~The~~ In this
experiment ~~[illegible]~~ CO_2 dissolved ~~dissolved~~ in water (On irradiation)
is ~~[illegible]~~ converted into free radicals ~~of~~ containing organic carbon
chains which react with molecular nitrogen
to form amino acids. A condition similar to
the above mixture is present in sea water
where ~~they~~ there may not be molybdenum
oxide but ~~the~~ are surely present other
minerals ~~and~~ ~~these~~ I am ~~convincing~~
~~convinced that many~~ other minerals other than
~~molybdenum oxide will work~~ which may act as catalyst
in ~~these experiments~~ the photosynthesis of amino acids. The ~~nature~~ of amino
acids synthesis will vary with catalyst

~~radiation wave length, pH~~ of the mixture and such ~~other~~ factors.

I hope you will find this interesting. The paper which I am sending you is still unpublished. I request you to keep ~~under~~ confidential till it is published some when. Mean while if you find it ~~[illegible]~~ necessary we can discuss on ~~[illegible]~~ it and there is no harm in discussing ~~the~~ the experiment, ~~particularly~~ when as ~~[illegible]~~ you suggested, there is some chance of ~~[illegible]~~ our meeting in the coming year. ~~Then~~ We will be best prepared ~~for useful [illegible]~~ helpful consultation ~~[illegible]~~ if we have a little experimental back ground before ~~[illegible]~~ we meet.

With best wishes.

Yours sincerely

Photosynthesis of amino. and [illegible] of which a many [illegible] sent to Prof Sien Ruy... on 13th Dec 1956.

ida.
56,
46-8
igle
been

Frm.

Dr. K.

My dear Uncle Graham,

Received your long awaited letter. We were too often remembering you and I droped you two letters. I do not know whether you received both of them. ~~Of course the second one I posted by surface mail.~~ We read that there was some political disturbance at your corner and we were too anxious of your welfair. We are happy to learn that Aunt is with you. ~~Naturally you must not be feeling so lonely now.~~ Convey her our regards and wishes. ~~I hope she will start liking the place in due course.~~

We are all doing well. My wife, Dr. S. Ranganayaki got her doctorate in December convocation 1955. ~~However~~ She is not very happy with the present state of affair. It happened like this. She was a teacher of Chemistry in a local Girl's Intermediate College and drawing about 200/- p. mth. then came a chance of officiating in a leave vacancy in the university Home Science Dept as lecturer in 300-500/- pr mnth. Thinking that it will mean a better prospect in future, she came to the university resigning her college job for there was no other ~~possibility~~ way of ~~coming~~ entering joining in the university otherwise, ~~because~~ for inspite of her six years services in the college. The college authorities did not agree to give her leave f

© I have been appointed as her boss by the Govt. What a fun!

every six month. The person, in whose vacancy she was officiating, came and now she is ~~at~~ having no job. She has applied in our department, where a few post of lecturers have fallen vacant but it is still to be seen whether the appointment committee appoints her in the department —— So far there are only gents-lecturers in the department and inspite of there being more than 200 girl students in the department, there is no lady-lecturer. So Rangam as I call her, and Dr. (Mrs.) S. Ranganayaki as she is know, was a bit disturbed ~~to~~ due her non employment. From the 1st. Dec. 56. Govt. of U.P. has appointed her to work under me as the Project Assistant for Rs 250/- per month on ~~a~~ a scheme of 'Butyl alcohol fermentation'. It is just a temporary matter ~~but but~~ though for a short ~~period~~ period © The little master about whom ~~of~~ you had a little hint long ~~ago~~ ago is now in this world as your notorious grand-son of nearly 10 months of age. ~~&~~ He is quite healthy, fair — in our way — and extremely mischievous ~~[illegible]~~. Ranjana our elder ~~[illegible]~~ daughter is now about 3½. She has started a little ~~of~~ going ~~about~~ the books. She is learning Hindi, ~~[illegible]~~ my mother ~~tongue~~, Tamil — Rangam's mother tounge and English. This is rather too much for her but she ~~a~~ has to do it ~~of~~ because unless she learns Hindi ~~[illegible] or~~ ~~she~~ it will not be considered that she has started her study, if she does not learn Tamil she

can not exchange a words with her maternal grand father and mother and english she has to study as matter of routine. She is too much interested in studies. She has got about a dozne of picture books and she makes Rangam to tell the stories of all of those pictur books some time as much as 20 times a days. Rangam's face is worth seeing when she is repeating these stories again and again. Thogh external loveing for Rajam and all of us who is caught to tell the story by this little girl - Rajam seems to take a new interest every time she hears the same story.

These days my sister in - law, Rajam's younger sister — Miss S. Rajam is living with us. She is of about 24 years and has joined Research in zoology in the Zoology Dept of A.U. Her problem being "Comparatin studing of Kidney of fishes". She always angry with me. Inspite of my best efforts to keep her happy I find that I am displeasing her in some aspect every second

way or the other. I do not think I am quarrel some but some how it is like that. The most surprising is that she holds the like me more than any person and I never understand this type of liking!

You remember Mr Lal but you have forgotten his name. It is Mr. RAM BABU. He often thinks to write you but there seem to be some gap between his determination & action and with his wonderful using taking things easy he is of no where. So far he has three times threatened to write to you, but every time he forgot it & lost the address.

We are sorry that Mr. Nehru did not reply your letter. He perhaps does not get the letters which are checked by his secretary. I also wrote him once or twice with the same effect of course I heard from the secretaries that the letter has been redirected to the require dept. of the govt for action — I never saw that any action was taken. Still there is no way. When you are writing to the Pakistan Prime minister you make

two more copies. Send One to the Secretary, Council of Scientific & Industrial Research, New Delhi and another to The ministry of Mining, Govt of India, New Delhi. How Knows they may consider. Pakistan's Govt. is not my stable.

Then comes the matter of my degree. The last and the most important thing which I wish to tell you is a very good news. I have got my D.Sc. in the convocation of this year held to-day, 8th Dec 1956. That was the reason I had delayed in writing to you. I wanted you to write after I get it. So that I may become a claimant of my present from my Uncle after getting this letter acknowledgement from the University.

Hoping to hear from you in near future

With best wishes to

Aunt. Your affectionately

K.

Fm

Dr. (Mrs). S. Ranganayaki
68, Dilkusha,
New Katra,
Allahabad
26. 11. 56.

To

The Secretary
Scientific Research Committee, U.P.
Allahabad.

Dear Sir,

with reference to your letter no. SRC/522 dated ~~Oct.~~ 23rd Nov. 1956 for my appointment as a Project Assistant, to work under the Supervision of Dr. Krishna Bahadur in the Univ. of Allahabad, I wish to say that I am willing to join the work and I will ~~join my post~~ report for duty from the 1st. Dec 1956 or earlier if necessary.

Thanking you.

Yours faithfully

R.

For.

K.

To

Raj. D. Ter-Avanesyan
Counsellor
The Embassy of the Union of
Soviet Socialist Republics in India,
Travancore House,
Curzon Road.
New Delhi.

Sir,

Dear ~~Raj. Ter-Avan~~

With reference to your letter no 1958 dated 29th June 1956 ~~regd~~ I wish to say that I have not heard anything from you so far. I have been invited to participate in the Intl. Symp. on Origin of life to be held in Moscow in August 1956. I want ~~you help~~ financial ~~help for the~~ aid for the travel expenses ~~to and~~ from Allahabad to Moscow and back. In your above mailed letter you had written that the matter is under consideration.

Please let me know as what happened to my application.

I will be thankful if you send an early reply. Sym

Yours
K.

8/12

68, Dilkusha,
New Katra
Allahabad. (India).

My dear Dr. Gurwitsch,

Received your letter of 2nd Oct '56. I am sorry I could not reply you earlier. It was partly due to the illness of my small son ten months old who got an attack of enteritis and now is has recovered. And partly because I was thinking of writing to you with a nice news which I was expecting to get with certainty by to-day. It is about my getting D. Sc. degree for Allahabad University. In the Convocation held this noon I was awarded this degree. Now I am eagerly waiting for your congratulations & presents!

The paper I sent to read in the Symposium of 'Origin of Life' I have send to Prof. Oparin. I was under the impression that he will give it to you to read. It seems that he himself is acting as referee, in that case I will send you another copy. I have given the paper for type and so I am sending you a copy of the paper in a separate cover.

However I will send you another copy of the paper. I am giving it for typing and I will soon send you a copy of ~~the~~ the paper.

~~Thanking~~ I thank you very much for the ~~copy~~ sending of ~~Dr~~ O. Balázs paper. I am ~~writing~~ writing him for further detail.

About my coming to Moscow it is still not settled. Prof. ~~Oparin~~ Oparin asked me to write to Prof. Thompson, Secretary General, International Union of Biochemistry, for financial aid for the trip to Moscow. I wrote to Prof. Thompson who said that he will consult the president and ~~the~~ treasurer and let me know what ~~can~~ he can do about it. Three months have passed ~~but~~ since all this happened and ~~now~~ I have heard nothing from him afterwards. I am dropping him a reminder.

These days ~~I have~~ I have ~~working on a bit on~~ ~~butanol~~ ~~helping~~ been helping in a Govt. Project of butanol and 2:3 butanediol fermentation. These materials are to be manufactured ~~by~~ for the ultimate synthesis of artificial rubber. Recently some work has been started in my laboratory under my supervision.

~~I~~ Rest ~~on~~ after hearing from you.

With my best wishes ~~and~~

Yours sincerely,

K.

8/12/56
Wrote to Prof. O. Balázs
requesting him to ~~write~~ send the
reprints of his two papers.

8/12/56. 68. . . .
. . .

My dear Prof. Dr. Santamaria,

It is long I have not heard from you. I hope you recd my detailed letter of 25th Oct 1956 in which I wrote my opinion regarding the photosynthesis of amino acids involving nitrogen fixation in presence of molybdenum oxide - colloid as catalyst. I want you to prepare a paper about it & publish it ~~in Enzian~~ mentioning that glycine & alanine are the amino acids identified.

There is good news for which I am writing you this letter in particular. This afternoon I got the degree of D. Sc. from Allahabad Univ. To-day the convocation of the Univ was held and I was given this honour.

~~Now I am eagerly waiting for your congratulations & wishes.~~

With best wishes
yours sincerely
K.

Prof. J. A. Wheat.
Natl. Research Lab.
Ottawa., U.S.A.

20.12.56.

My dear Prof. J. A. Wheat.

I read with ~~great~~ interest, the abstract of your paper ~~Can~~. J. Technol. 31. 73-84 (1953). I shall be thankful if you send me a ~~pa~~ reprint ~~copy~~ of this paper. ~~[illegible]~~ I together with my wife ... I am ~~[illegible]~~ ~~and~~ I am ~~doing~~ investigating on ~~a little~~ the ~~metabolism~~ of n-butanol and 2.3 butanediol ferment~~ation~~ing bacteria ~~with a view of producing this material on commercial scale so that these products may be utilised for the production of synthetic rubber. I have a few organisms to begin with as Cl. acet Clostridium acetobutylicum (Me, coly. et al), Cl. pasteurianum (Bezssonoff), Cl. butylicus (Fitz), Bacillus~~

Vigorous.
investigating

I have ~~[illegible]~~ at present Bacillus subtilis and Serratia marcescens ~~to~~ begin with though a consignment of a few more organisms are soon to arrive. I have a few difficulties ~~as Aerobac~~ as in the estimation of 2.3. butanediol and separation of the alcohol from the other materials formed during the fermentation due to vigorous frothing. Though ~~we am~~ I am employing certain methods of estimation of 2.3. butanediol involving oxidation of the alcohol ~~to acetaldehyde~~ and subsequent estimation of the aldehyde

either
~~by precipitating the~~

thus formed we I find that these
methods consume ~~take~~ a lot of time and
it becomes difficult to use them
when one has to estimate other compounds
~~2+3 also as well~~ as well not to speak of the number of cultures.
~~of cultures~~. Can you suggest some
convenient ~~prac~~ method of ~~its~~
~~estimation~~?

~~We~~ I shall be extremely thankful
if you can manage ~~manage~~ to send ~~us~~ me
cultures of Aerobacter aerogenes
and Pseudomonas hydrophila.
I am ~~We are~~ anxiously waiting ~~with~~
~~great ar~~ to hear from you.

Yours sincerely
K.

To Shanti Prakash
Secy

Sec. Govt. Com.
U.P. Alld.
SRC/599 — 22nd Dec. 1956.

~~From~~

~~Dr~~ Mrs. S. Ranganayaki
Chemistry ~~M.Sc. Ph~~ Dept
Allahabad ~~Univ~~
Alld.

To

Dr. Shanti Prakash.
Secy
Sc. ~~Govt~~ Comit. U.P.
Alld.

With reference to your letter no. SRC/599 dated 22nd Dec 1956 I am herewith sending you an out line of the work I propose to do. ~~and~~ I will be sending you the months report of the progress of work in due time.

Yours faithfully
S.R.

Report of the Plan

We are ~~plan~~ trying to get a few Organisms which ferment starch & Sugar producing n-butanol and 2,3 - butanediol in good yield. ~~We~~ getting the collecting of We have written for the following organisms to the various culture centers of America, Canada, France and Germany and of ~~the~~ our country.

Clostridium acetobutylicum, Cl. pasteurianum, Cl. butylicum, Aerobacillus polymyxa, Aeromonas hydrophila, Bacillus subtilis, & Serratia marcescens, ~~Aerobacter aerogenes~~ Pseudomonas hydrophila.

~~We~~ A number of the culture centers have promised us to send ~~them~~ some of these organism and the consignment of B. subtilis & Serratia marcescens have already arrived.

We will investigate the optimum conditions for the n-butanol & 2.3 butanediol formation by these organisms ~~and~~ and investigate as which of these organism is best suited for our Indian environment. An effort to prepare ~~strain~~ Mutants producing high yield of the alcohols will also be made. ~~from these organisms by~~

~~Heat Shock Treatment~~ Process will also be made.

An thorough investigation of the various conditions of the cultures for the maximum production of n-butanol, 2,3 butanediol of these organisms will be made employ different cheap raw materials as Cereal Starch and molasses and the source of carbon.(1)

~~We~~ We will also work out the ~~ways~~ process of the separation of these alcohol particularly 2.3. butanediol from the fermented liquid which is next to a technical problem in the fermentation of this alcohol. We will try different devices as extraction of ~~the~~ cheap solvent, ~~and~~ concentration of evaporation and investigate whether any new method of their separation can be devised.

We will devise ~~for this~~ way & means of ~~this~~ checking frothing during the distillation of the fermented liquid and ~~an~~ find out some quicker process of estimation of 2-3. butanediol which will ~~be influenced~~

(1) And an a search for the cheap nitrogen & phosphate source for these organisms will also be made.

only make the investigating of the influence ~~of~~ of different conditions the symbiosis culture possible.

To.

Prof. A. I. Oparin.
26/12/56.

~~Dear Sir,~~ My dear Prof. Oparin,

To-day I ~~received a letter~~ am sorry to hear from Prof. R. H. S. Thompson, Secretary of the International Union of Biochemistry, ~~that~~ ~~if~~ ~~I~~ that ~~As~~ as India is not yet a member of the Union ~~the~~ my application for the travel grant to Moscow will not be considered. It is really a matter of great regret that the barrier of nationality should stand so much in the pursuit of knowledge. I do not see ~~why~~ why I was invited at all when I am to be ~~to~~ given such ~~a~~ a discriminating treatment as the chairman of the symposium.

~~Will~~ Can't you bring some influence ~~in~~ in the matter of getting me the travel grant particularly when you have personally ~~read~~ my paper?

I ~~will~~ am eager to meet you all ~~and~~ will all that in my mind which I wrote to you. I shall be ~~R~~ extremely thankful if you can help me in the matter of the travel grant.

Yours ...

Report of the Work done in Dec. 1956.

From: Dr. S. Rangnekar (Project Assistant)

Activated the cultures of B. Subtilis & Serratia marcescens obtained from the National Chemical Laboratories, Poona. ~~We are in~~ The influence of concentration ~~on the~~ of carbon food in the culture media of these organisms on their 2.3-butanediol formation is under investigation. The standardisation of the process of the 2,3-butanediol estimation is also being investigation. However we ~~are handicapped~~ are yet waiting for a few chemicals to arrive which have been ordered.

The investigation of ~~the~~ influence of bios from ~~butter~~ skim-milk on the ~~growth~~ fermentation of the above said organisms and the simultaneous ~~effect~~ neutralisation of the acids of fermentation by calcium carbonate on the formation of 2.3-butanediol is also under investigation.

8/1

Fm

. . 1

To.

Le Collections Director
Centre de Types Microbiens,
19, Avenue Cesar Roux,
Lausanne.
(Suisse)

Dear Sir,

With reference to your letter no. 1913 dated 27.XI.56, I thank you very much for ~~We have received~~ cultures of the organisms from Division of Applied Biology, National Research Council, Ottawa, Canada as directed by you.

~~We will write to you~~

However I require following two more organisms for my research.

Mycrothecium verrucaria
Clostridium cellulosolvens.

I will be thankful if you can arrange to send them too.

Thanking you,

Yours sincerely,

K.

8/1

Fr.

. . .

To

Miss Mary. T. Clement
Curator, Stock Culture
Collection;
Division of Applied Biology,
National Research Council,
Ottawa 2, Canada,

My dear Miss Mary. T. Clement,

With reference to your letter of file no. 5-1.7, dated 5. XII, 56 I thank you very much for ~~[illegible]~~ sending me the six bacteria cultures. The consignment reached me safely.

How I hate to trouble you a bit more for we are in search of the following organisms also:

Mycrotheceium verrucaria,
Clostridium Cellulosolvens

I shall be thankful if you can arrange to send these cultures also. I shall feel ~~[illegible]~~ happy if I can do a bit for you too.

With best wishes. Yours sincerely

K.

5/1

Fm.

Dr.

To Prof. A. I. Oparin.

My Dear Prof. Oparin,

I received a letter from Dr. G. A. Deborin, ~~mention~~ dated ~~Dec~~ 21st Dec. 1956 in which he wrote that you are coming to India to attend the "World Science Congress" and that you want to meet me concerning the symposium on 'Origin of Life" to be held in Moscow. Is it?

Due to unavoidable ~~sig~~ circumstances I can not come to Calcutta and moreover I am not sure that it is this Science Congress which you are coming to attend. In case you come to Calcutta & you please let me know whether you want to meet me there in Calcutta. In case you have something important to discuss please send me an ~~at~~ express wire to me at the following address and I shall love to

meet you.

Dr. Krishna Bahadur,
68, Dilkusha, New Katra,
Allahabad.

However ~~[illegible]~~ I very much like you to come to Allahabad for a few days and spend some time with me.

I shall be thankful if you send an early reply.

Yours Sincerely,
K.

Fm.

To. The Secretary
Science Congress,
Calcutta.

Dear Sir,

I have come to know that Prof. Oparin is coming to attend the 'Science Congress" at to be held at Calcutta. I ~~very~~ ~~most~~ much shall be very thankful if you send me a confirmation of the news.

I ~~will be thankful~~ If you can, please send me an outline of Prof. Oparin's programme in India after the Scien Congress.

Thanking You.

Yours faithfully
K.

7/1/56. From Dr. K. Bagchi

To
The Director
Centraalbureau voor
Schimmelcultures
Javalaan 20, Baarn,
Holland.

Dear Sir,

Thank you very much for your letter No. ~~dra~~ dra H.E.H-B dated 27th Nov. 1956. I will contact the American ~~cult~~ Type Cultures as suggested by you.

Thanking you very much.

Yours

Dear Sir,

I am herewith enclosing a letter from Dr. G. A. Deborin which is written in Russian. Here it has been translated as follows:—

"

"

As far as I know there is no world science congress being held in India. There is no doubt ~~are~~ the ~~Indian Sci~~ session of Indian Science Congress ~~being held~~ taking place at Calcutta from 14th Jan. I donot intend to attend it. There fore I shall be glad to know this detailed programme of Prof. Oparin. ~~I may further~~ I would like to add that Allahabad is ~~not~~ on the rail N.P. route of Calcutta from Delhi. If he intends to come by train, ~~it shall be good of him~~ if he can ~~drop~~ stay here for few hours ~~& have a person~~ and I may have a chance to talk with him in person. Otherwise ~~if you pos~~ please inform the place nearest to my station where I ~~co~~ may be able to contact him easily.

I request ~~any~~ you to ~~[illegible]~~ reply ~~by as soon as pos~~ by return mail & also return the letter of Dr ~~Dr~~ Deborin.

8/1/57

From

Dr. K. Bahadur.

To

Prof. H. Mislin ~~Sekr.~~
Editor
EXPERIENTIA
Birkhauser Verlag
Basel 10. (Switzerland)

Dear Prof. Mislin,

Recd your letter no. Mi/ga dated 27th Nov. 1956. I do not very much agree with your suggestion that the yeast cells under oligodynamic effect of the metals present in the culture ~~acquire~~ acquire the capacity of utilising the nourishment ~~added~~ introduced in the culture ~~in [illegible] together~~ with the inoculating culture ~~[illegible]~~ [illegible] because the quantity of the seed-yeast employed was ~~[illegible]~~ just in traces and hardly ½ drop of seed-yeast was added ~~[illegible]~~ in a culture of 100 cc. and the seed-yeast itself containing ~~very~~ initially very ~~[illegible]~~ little nutrient & thus will hardly ~~[illegible]~~ provide enough nourishment for such a large number

of yeast cells, as are observed in a few of them. Secondly neither the cultures which contain metal & seed yeast, through which CO_2 free air is passed, nor those cultures in which the seed yeast is added but no metal is put but CO_2 containing air is passed, show any growth of yeast. Thus it is neither metal & nutrients introduced with the seed-yeast is sufficient to support yeast growth nor the cultures which contain seed-yeast or cultures through which CO_2 containing air is pass can support yeast growth.

I do not see that it is necessary to suppose that the Oligodynamic effect is evident only when metal & CO_2 are put.

We have observed similar chemoautotropic (Winogradsky) property in others yeasts also. I am herewith sending you our paper published in Japan.

Thus I believe the discussion of the paper I sent you of is quite reasonable. even now you are not satisfy you

However if you find the paper not appropriate for your journal I request you to send me back my paper and the reprint I and sending you.

Thank you. Yours f

From 9/1 Dr. K. Bal...

To Surface mail

Dr. C. Stapp.
Oberregierungsrat a. D.,
Biologische Bundesanstalt
Braunschweig.
(Germany).

Dear Sir,

Thank you for ~~[illegible]~~ your letter of 30th 10. '56. I will contact the American Type Cultures Collection as suggested by you. I wish I shall be able to do some thing for you. Thanking you.

Yours sincerely.
K.

From 9/1 Dr. K. Bal...

To Surface mail.

Dr. rer. nat. W. Uecker
Robert Koch-Institut,
Berlin-N 65,
Föhrer Stra~~sse~~ 2

Dear Sir, Thank you very much for your letter dated 29. 10. 56. We shall contact the addresses which you send for the culture of the ~~bacteria~~ bacteria.

I ~~shall~~ will feel ~~[illegible]~~ happy if I can do some thing for you too.

Yours Sincerely
K.

9/1 To ~~Air Mail~~

The Prof. William C. Haynes,
Bacteriologist,
Culture Collection Unit
Fermentation Section,

United State. Dept. of Agri.
Agr. Rec. Service,
Northern Utilisation
Rec. Branch.
Peoria, Illinois,

Dear ~~Sir~~ Prof. Haynes,

With refer to your letter ~~no~~ dated ~~no~~ 14th Nov 1956, I ~~and~~ wish to tell you that I has so far not recd the culture of the bacteria you sent to me.

Please see whether those culture were sent from your place.

I shall feel obliged if you send an early reply.

Thanking you.

Yours sincerely
K.

To

Reminder to

Dr. H. Stolp.
Biologische Bundesanstalt
fur Land- und Forstwirtschaft.
Berlin-Dahlen,

See the complete address

Prof. Oparin to participate in the International Symposium on the Origin of life ~~&~~ which is being organised ~~the~~ under the auspices of International Union of Biochemists and arranged by the U.S.S.R Academy of Sciences, Moscow. ~~to~~ It ~~then~~ is to be held in ~~the~~ Aug 1957.
~~The~~ ~~time~~ I am thinking of going provided they are willing to pay for the travel expenses. ~~So for they have~~ ~~not~~ Rest ~~ar~~ ~~to~~ after hearing ~~after~~ from you.

Yours Sincerely

K

11/9

Leonidas Santmaria

8 My dear Prof Dr. ~~Sant~~ ~~Lo~~ida Sandana

I hope you must have returned after your pleasant vacation by now and you might have begun your work.

I am very much interested in hearing about your progress in the work of photosynthesis of amino ~~[illegible]~~ acids, particularly those pertaining ~~[illegible]~~ [illegible] the molybdenum oxide!

Colloid.

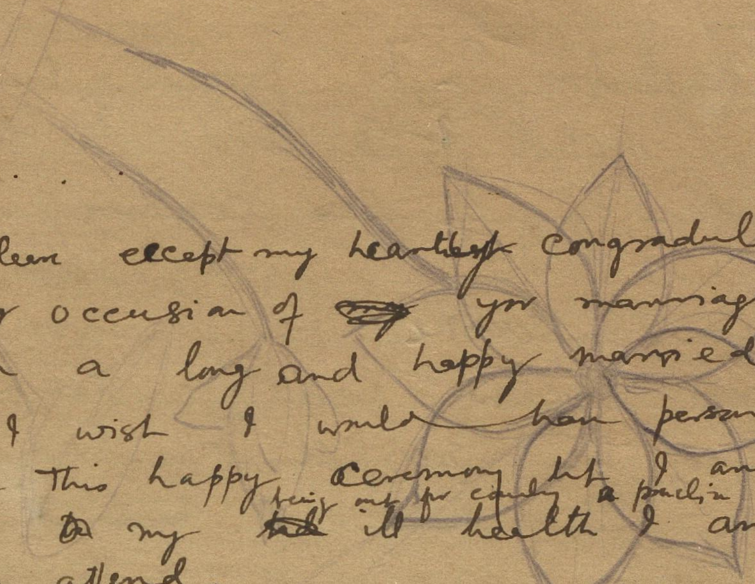
I shall be thankful if you oblige me with an early reply.

Recently I have ~~[illegible]~~ received an invitation of

To 11/9

Shri Raghubir Singh passed his M.Sc. in 1954. I had an opportunity of coming in contact with him during his study for his master's degree. He was an intelligent and hard working good student and had a keen insight of the subject. He has good practical hand and he will prove to be a good experimentalist some day and has the capacity to put his sound theoretical knowledge to practical use. He is working as a research scholar in Shila Dhar

He has done good work on the formation and reclamation of Usar land for his D. Phil degree and his finding will prove to be of great help to the millions of our countrymen who are suffering due to the land wide spread Usar land. He will be an asset to any institution which can utilize his services. I wish him success.



My dr.

Please accept my heartiest congratulation for at the happy occasion of your marriage. May God give you a long and happy married life.

I wish I would have personally come to attend this happy ceremony but I am sorry being out for candy a practice examination due to my ill health I am unable to attend.

Once more congratulate you warmly

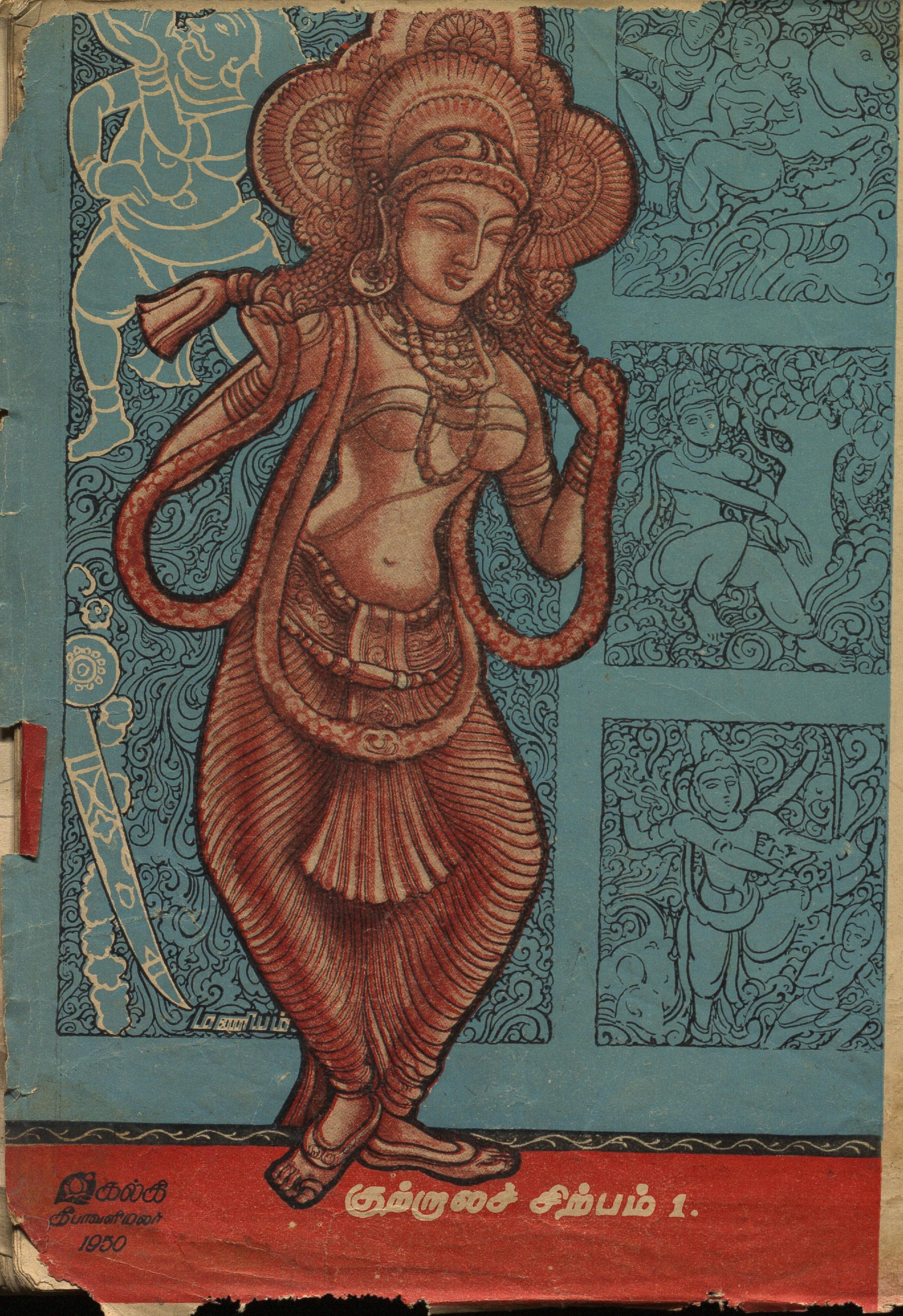
Yours sinj.

To Sri Ram Rattan Bakole, I Kailash mehrotra.

24/2/37

x ← . A + b

வானுலகைத் தாம் அணுகிச் சென்ற போதிலே
வாசலிலே நின்றுவர வேற்றவர் யாரோ?
வானவரும் தேவியரும் வந்து வணங்கி
நாசமலர் எந்தி ஜய போற்றி சொன்னரோ?


மணியம்
கல்கி
தீபாவளி மலர்
1950
குற்றாலச் சிற்பம் 1.

(1) # 492 Pseudomonas hydrophila, Ottawa.
(2) M - 148 Aerobacter aerogenes "
(3) # 474 Aerobacter aerogenes "
(4) C-3(2) Bacillus Polymyxa "
(5) B-2 Bacillus Subtilis. "
(6) S-29 Serratia Marcescens. "
(7) B. Subtilis — Poona.
(8) S. ~~Mar~~ marcescens — "

379-6-0
320-0-0
320-0-0
1019-6-0

Mossmie