

Proceedings of 31st Meeting of
Board of Scientific and Industrial
Research Sep. 22, 1953

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Proceedings

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OF THE 31st MEETING OF THE

Board of Scientific & Industrial Research

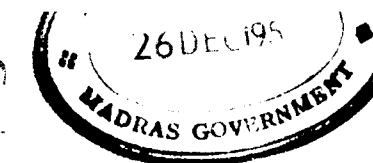


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SEPTEMBER 22, 1953

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH, NEW DELHI

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COMMITTEE OF THE BOARD OF SCIENTIFIC & INDUSTRIAL RESEARCH

LIST OF RESEARCH COMMITTEES OF THE B.S.I.R. AND THEIR CHAIRMEN.

1. Physical Research Committee.	Chairman	Dr. D.S. Kothari.
2. Radio Research Committee.	„	Dr. K.S. Krishnan, F.R.S.
3. Atmospheric Research Committee.	„	Dr. K.R. Ramanathan.
4. High Altitude Research Committee	„	Dr. K.R. Ramanathan.
5. Committee on the Measurement of Geological Time in India.	„	Dr. D.N. Wadia, F.N.I.
6. Statistics, Standards and Quality Control Committee.	„	Prof. P.C. Mahalanobis, F.R.S.
7. Building Research Committee.	„	Major Gen. H. Williams, C.B.E.
8. Internal Combustion Engines Research Committee.	„	Dr. J.C. Ghosh, F.N.I.
9. Chemical Research Committee.	„	Dr. K. Venkataraman. (at present abroad) Dr. A. Nagaraja Rao (Acting Chairman)
10. Pharmaceuticals and Drugs Research Committee.	„	Major Gen. S.S. Sokhey. (at present abroad) Col. R.N. Chopra (Acting Chairman)
11. Malaria Chemotherapy Committee.	„	Major Gen. S.S. Sokhey. (at present abroad) Col. R.N. Chopra (Acting Chairman)
12. Bio-chemical Research Committee.	„	Dr. V. Subrahmanyam.
13. Mining Research Committee.	„	Mr. N. Barraclough.
14. Fuel Research Committee.	„	Mr. N. Barraclough.
15. Coal Blending and Coking Research Sub-Committee.	„	Mr. S.K. Nannavati.
16. Glass and Refractories Research Committee.	„	Mr. D.N. Sen.
17. Salt Research Committee.	„	Dr. Mata Prasad, F.N.I.
18. Essential Oils Research Committee.	„	Mr. A.K. Menon.
19. Vegetable Oils Research Committee.	„	Prof. T.E. Seshadri.
20. Vanaspathi Research Advisory Committee.	„	Dr. S.S. Bhatnagar, F.R.S.
21. Metals Research Committee.	„	Mr. J.J. Ghoshy.
22. Plastics Research Committee.	„	Dr. L.C. Verma, F.N.I.
23. Cellulose Research Committee.	„	Dr. B.K. Vaidya.
24. Leather Research Committee.	„	Mr. B.M. Das.
25. Road Research Committee.	„	Mr. N.P. Mathias.

A meeting of the Committee of the Board was held on Monday, the 21st September, 1953, in Pilani. The following were present:—

Lala Shri Ram	(in the Chair)
Dr. S.S. Bhatnagar	(D.S.I.R.)
Dr. Jivraj N. Mehta	(Member)
Prof. M.N. Saha	„
Dr. K.A. Hamied	„
Dr. D.N. Wadia	„
Dr. J.C. Ghosh	„
Shri R.P. Bahadur	(Secretary)
Shri Kasturbhai Lalbhai	was present by invitation.

The Agenda for the 31st meeting of the Board of Scientific & Industrial Research was discussed and recommendations were made.

BOARD OF SCIENTIFIC & INDUSTRIAL RESEARCH

The 31st meeting of the Board of Scientific & Industrial Research was held on Tuesday, the 22nd September, 1953 at New Delhi. The Hon'ble Shri Jawaharlal Nehru presided and the following were present:—

Maulana Abul Kalam Azad	(Vice-President, C.S.I.R.)
Dr. S. S. Bhatnagar	(D.S.I.R.)
Dr. B. C. Roy	(Member)
Dr. Jivraj N. Mehta	„
Dr. J. C. Ghosh	„
Dr. D. S. Kothari	„
Prof. M. N. Saha	„
Lala Shri Ram	„
Shri Kasturbhai Lalbhai	„
Dr. K. A. Hamied	„
Dr. D. N. Wadia	„
Shri R. P. Bahadur	(Secretary, C.S.I.R.)

The Board passed resolutions of condolences on the demise of Dr. Shyama Prasad Mookerjee, ex-Vice-President of the Council and Mr. Abdul Halim Ghaznavi, ex-Member of the Board.

At the instance of Shri Kasturbhai Lalbhai, the Board discussed the question of scrutiny of the research programmes of the various National Laboratories under the Council and after a detailed discussion in which all the members took part, the Board recommended that (1) the Advisory Boards attached to the various National Laboratories should function more effectively; they should meet not less than twice a year and they should be in intimate touch with the universities in the country, (2) a scientist should be appointed as Dy. D. S. I. R. (Tech) to go round the various laboratories and look into the programmes of research, (3) every five years a review of the work done by the National Laboratories should be made in which visiting experts from foreign countries may be associated.

It was also recommended that wherever possible representatives of the universities should be co-opted on the Advisory Boards. It was further recommended that besides the two formal meetings, members of the Advisory Boards may meet more often informally to acquaint themselves with the work of the National Laboratories and thus keep in constant touch with their progress.

The Board then considered the various recommendations of the Committee of the Board.

Proceedings of the XXXI meeting of the Board of Scientific and Industrial Research
held on 22nd September, 1953.

Item No.	Subject.	Reference to page in the Proceedings.
I.	Confirmation of the proceedings of the 30th meeting of the Board of Scientific and Industrial Research held on the 10th March, 1953.	1
	Research Schemes :	
II.	Use of Photomultiplier Tube for measurement of Feeble X-ray Intensity by Prof. K. Banerji, Head of the Department of Physics, Allahabad University.	1
III.	Study of X-ray Emission and Absorption Spectra in the Region 1.8A to 10A by Dr. G.B. Deodhar, Physics Department, University of Allahabad.	1
IV.	Ruling Engine for Diffraction Gratings by Dr. P.K. Kichlu, Department of Physics, Delhi University.	3
V.	Industrial Spectroscopy by Dr. P.N. Sharma, Professor of Physics, Lucknow University.	5
VI.	Electron-diffraction Studies on Semiconductor Rectifiers and Development of Copper Oxide Triode by Prof. K. Chakravarti, Head of the Physics Department, Institute of Science, Bombay.	7
VII.	Study of Absorption and Dielectric Properties in the Microwave Region by Dr. P.N. Sharma, Professor of Physics, Lucknow University.	9
VIII.	Study of Atmospheric Radioactivity at Allahabad by Dr. G.B. Deodhar, Physics Department, Allahabad University.	11
IX.	Combustion of Pulverized Coal by Dr. B. Ghosh, Assistant Professor of Chemical Engineering, College of Engineering and Technology, Calcutta.	11
X.	Installation of Auxiliary Units to the 25 t/day Lurgi Low Temperature Carbonisation Plant by the Director, Central Laboratories, Hyderabad (Dn).	13
XI.	Systematic Audit of Fuel Heat and Power in Industry in Hyderabad State by the Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn).	21
XII.	Catalytic Oxidation of Ammonia and the Verification of the 'General Theory of Residual Affinity Elucidating Specific Nature of Catalysts' by Prof. S. Ghosh, Head of the Chemistry Department, Allahabad University.	23
XIII.	Pilot Plant Activation of Bauxite by the Director, Central Laboratories for Scientific and Industrial Research, Hyderabad (Dn).	25
XIV.	Activation of Hyderabad Earths for Leaching of Oils on Pilot Plant Scale by the Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn).	27
XV.	Pilot Plant Production of Fatty Acids by the Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn).	29
XVI.	New Sources of Edible Oils by Dr. M.A. Aziz, Reader in Chemistry, Muslim University, Aligarh.	31
XVII.	Stability and Components of Fatty Acids in Hydrogenated Fats by Dr. N.G. Magar, Institute of Science, Bombay.	31

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Item No.	Subject.	Reference to page in the Proceedings.
XVIII.	Development of Rose Oil Industry in India (Chemical Aspects) by D.R. Dhingra Principal, Hartcourt Butler Technological Institute.	33
XIX.	Studies into the Physiology and Ecology of Palm Trees to Enhance the Quality and Quantity of Juice for Manufacture of Sugar by Prof. T.C.N. Singh, Head of the Department of Botany, Annamalai University.	37
XX.	Preservation of Neera and Jaggery by Dr. V.P. Nair, Director, Industries & Commerce, Travancore-Cochin, Trivandrum.	39
XXI.	Utilisation of Molasses by Director, Sugarcane Research and Development (Bihar State), Pusa, Bihar.	43
XXII.	Studies on Antifungal Antibiotics by Dr. S.K. Bose, Department of Biochemistry, University of Calcutta.	45
XXIII.	Virus Inhibition Studies by Dr. S.N. Das Gupta, Head of the Department of Botany, Lucknow University.	47
XXIV.	Studies on the Production of Antibiotic Substances by Streptomyces Spp. by Dr. P.N. Nandi, Head of Microbiology Section, Bose Research Institute, Calcutta.	49
XXV.	Protection of Timber against Attack by Marine Organisms by the President, Forest Research Institute, Dehra Dun.	53
	New Proposals :	
XXVI.	Creation of an Analytical Wing in the Central Drug Research Institute, Lucknow, by the Director, C.D.R.I., Lucknow.	57
XXVII.	Creation of a Division of Biophysics in the Central Drug Research Institute, Lucknow by the Director, C.D.R.I., Lucknow.	59
XXVIII.	Proposal for Publishing an Indian Nautical Almanac by Prof. M. Saha, Calcutta.	65
XXIX.	Symposia under the auspices of the C.S.I.R.	69
	Proceedings of the Research Committee :	
XXX.	Proceedings of the Plastics Research Committee. (Chairman : Dr. L.C. Verman)	73
XXXI.	Proceedings of the Committee on Statistics, Standardisation and Quality Control (Chairman : Prof. P.C. Mahalanobis, F.R.S.)	79
XXXII.	Proceedings of the Pharmaceuticals and Drugs Research Committee. (Acting Chairman : Col. R.N. Chopra)	87
XXXIII.	Proceedings of the Coal Blending and Coking Research Sub-Committee. (Chairman : Mr. S.K. Nanavati)	95
XXXIV.	Sharing of Profits of the Scheme on "Pilot Plant Experiments on the Manufacture of Nitro-benzene, Aniline and Dimethylaniline" by Dr. P.C. Guha, Indian Institute of Science, Bangalore.	101
	<i>Items received late are included in the Supplementary Proceedings.</i>	107-133

RESEARCH SCHEMES

Item No.	Particulars												
I	Confirmation of the proceedings of the 30th meeting of the Board of Scientific and Industrial Research held on the 10th March, 1953.												
II	Subject : Use of Photomultiplier Tubes in the Measurement of Feeble X-ray Intensity by Prof. K. Banerji, Head of the Department of Physics, Allahabad University. Object and Scope : The object of this scheme is to modify the photomultiplier tubes for the measurement of feeble X-ray intensities by modulating the X-ray beam and by amplifying the modulated current of the photomultiplier tube. Preliminary tests carried out by the author have shown the feasibility of the method. The modified tube may find application in the determination of structure of materials by X-ray, Fourier's method of crystal analysis and investigation of diffraction of partially crystalline materials. Duration : The investigation is expected to take five years. Grant asked for : <table> <tr> <td>Equipment</td><td>Rs. 5,000</td></tr> <tr> <td>(Photomultipliers, A. F. multipliers, modulating equipment.)</td><td></td></tr> <tr> <td>Contingencies</td><td>Rs. 1,000</td></tr> <tr> <td>Staff</td><td>Rs. 10,860 (including allowances.)</td></tr> <tr> <td>(One S. S. A., One J. S. A., One Mechanic and One Skilled Bearer)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 16,860 (including allowances.)</td></tr> </table> Research Committee's recommendation : The scheme has been referred to the Physical Research Committee for opinion.	Equipment	Rs. 5,000	(Photomultipliers, A. F. multipliers, modulating equipment.)		Contingencies	Rs. 1,000	Staff	Rs. 10,860 (including allowances.)	(One S. S. A., One J. S. A., One Mechanic and One Skilled Bearer)		Total	Rs. 16,860 (including allowances.)
Equipment	Rs. 5,000												
(Photomultipliers, A. F. multipliers, modulating equipment.)													
Contingencies	Rs. 1,000												
Staff	Rs. 10,860 (including allowances.)												
(One S. S. A., One J. S. A., One Mechanic and One Skilled Bearer)													
Total	Rs. 16,860 (including allowances.)												
III	Subject : Study of X-ray Emission and Absorption Spectra in the Region 1.8A to 10A by Dr. G. B. Deodhar, Physics Department, University of Allahabad. Object and Scope : The object of the scheme is to carry out detailed and systematic study of the emission and absorption spectra of the various elements in the region 1.8A to 10A to bring out new features such as inter-orbital and forbidden transitions, satellite lines and structure of absorption edges.												

Recommendations of the Committee of the Board.	Recommendations of the Board.										
I. P. 1. The Committee noted that proceedings of the 30th meeting of the B.S.I.R. held on the 10th March 1953 had already been circulated to the members and no member had raised any point which required reconsideration. The Committee, therefore, recommended that proceedings of the 30th meeting of the B.S.I.R. be confirmed.	I. p. 1. The Board noted that proceedings of the 30th meeting of the B.S.I.R. held on the 10th March 1953 had already been circulated to the members and no member had raised any point which required reconsideration. The Board, therefore, confirmed the proceedings of the 30th meeting of the B.S.I.R.										
II. P. 1. The Committee noted that the Physical Research Committee and the Radio Research Committee had recommended the scheme for sanction (vide proceedings of the Physical Research Committee item (v), p. 117 of the Supplementary Agenda and Proceedings of the Radio Research Committee item (iv), p. 125 of the Supplementary Agenda). The Committee recommended that the Research Scheme on the Use of Photomultiplier Tubes in the Measurement of Feeble X-ray Intensity by Prof. Banerji be approved and the following grant be sanctioned (upto the end of current financial year) : <table> <tr> <td>Equipment</td><td>Rs. 1,500</td></tr> <tr> <td>Contingencies</td><td>Rs. 500</td></tr> <tr> <td>Staff:</td><td>Rs. 1,300 (including allowances)</td></tr> <tr> <td>(One J.S.A)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 3,300 (including allowances)</td></tr> </table>	Equipment	Rs. 1,500	Contingencies	Rs. 500	Staff:	Rs. 1,300 (including allowances)	(One J.S.A)		Total	Rs. 3,300 (including allowances)	II. p. 1. The Board endorsed the recommendation of its Committee.
Equipment	Rs. 1,500										
Contingencies	Rs. 500										
Staff:	Rs. 1,300 (including allowances)										
(One J.S.A)											
Total	Rs. 3,300 (including allowances)										

RESEARCH SCHEMES

Item No.	Particulars
	<i>Author's work :</i>
	Dr. Deodhar has studied the K spectra of Si, P and Cl in Prof. Siegbahns' Laboratory in Sweden (reported in the Proceedings of Royal Society 1952).
	<i>Grant asked for :</i>
	Equipment ... Rs. 15,000 (Vacuum plane single crystal spectrograph and accessories, demountable X-ray tube, oil diffusion and back pump)
	Contingencies ... Rs. 1,000
	Staff ... Rs. 2,940 (including allowances). (One J.S.A. on Rs. 160 p.m.)
	Total Rs. 18,940 (including allowances).
	<i>Research Committee's recommendation :</i>
	The scheme has been referred to the Physical Research Committee for opinion.
IV.	<i>Subject :</i> Ruling Engine for Diffraction Gratings by Dr. P.K. Kichlu, Department of Physics, Delhi University.
	<i>Object and Scope :</i>
	The object of this scheme is to carry out preliminary study, both theoretical and experimental, with the ultimate object of constructing a ruling engine for making diffraction gratings for which a detailed scheme may be submitted later.
	<i>Author's work :</i>
	Dr. Kichlu says that in an earlier scheme he had worked on the machining of the double-cone ruling points of diamond for cutting the grooves on the gratings.
	Dr. Kichlu is in correspondence with Prof. G.R. Harrison (MIT), H.D. Babcock (Mount Wilson Observatory) and J. Strong (California Institute of Technology) on the subject.

Recommendations of the Committee of the Board.	Recommendations of the Board.										
.. p. 1-3. The Committee noted that the Research Scheme Study of X-ray Emission and Absorption Spectra Dr. Deodhar had since been recommended by Physical Research Committee (vide proceedings the Physical Research Committee item (vii) p. 117, the Supplementary Agenda). The Committee recommended that the Research Scheme be approved and the following grant be sanctioned (upto the end of current financial year) :— <table> <tr> <td>Equipment</td><td>Rs. 1,500</td></tr> <tr> <td>Contingencies</td><td>Rs. 500</td></tr> <tr> <td>Staff:</td><td>Rs. 1,300 (including allowances)</td></tr> <tr> <td>(One J. S. A)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 3,300 (including allowances)</td></tr> </table>	Equipment	Rs. 1,500	Contingencies	Rs. 500	Staff:	Rs. 1,300 (including allowances)	(One J. S. A)		Total	Rs. 3,300 (including allowances)	III. p. 1-3. The Board endorsed the recommendation of its Committee.
Equipment	Rs. 1,500										
Contingencies	Rs. 500										
Staff:	Rs. 1,300 (including allowances)										
(One J. S. A)											
Total	Rs. 3,300 (including allowances)										

RESEARCH SCHEMES

Item No.	Particulars
	Grant asked for :
	Equipment Nil
	Contingencies ... Rs. 1,500
	Staff: Nil
	(The services of the mechanic in the scheme on synthetic sapphires will be available for preparing models and plans for the ruling engine)
	Total Rs. 1,500
	Research Committee's recommendation :
	The scheme has been referred to the Physical Research Committee for opinion.
V	Subject : Industrial Spectroscopy by Dr. P. N. Sharma, Professor of Physics, Lucknow University.
	Object & Scope :
	It is proposed to study the application of spectroscopic methods for chemical analysis of alloys used in industries. The methods developed may be later applied to the analysis of minerals found in India.
	Collaboration :
	The Physics Department of Lucknow University has got a number of spectrographs.
	Dr. N. K. Mundle, Lecturer in Physics, Lucknow University who has worked in this line in the University of Michigan, U. S. A. will collaborate.
	The Geological Department of the University will also collaborate.
	Duration :
	The scheme will take three years for completion.

Recommendations of the Committee of the Board.	Recommendations of the Board.
IV. p. 3-5. The Committee noted that the Physical Research Committee had recommended a contingent grant of Rs. 1,500/- to Dr. P. K. Kichlu for preliminary study on the Construction of Ruling Engines for Diffraction Grating (vide Proceedings of the Physical Research Committee item 3 (iii), p. 115 of the Supplementary Agenda). The Committee recommended sanction of the grant to Dr. Kichlu.	IV. p. 3-5. The Board endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars.
	Grant asked for the first year : Equipment (Hilger non-recording microphoto-meter). ... Rs. 7,140 Contingencies (photographic material, minerals & metals etc.). ... Rs. 1,500 Staff : (one J.S.A. on Rs. 200 p.m.) ... Rs. 3,420 (including allowances) Total Rs. 12,060 (including allowances) (Equipment grant of Rs. 7,000 has been asked for the second year). <i>Research Committee's recommendation :</i> The scheme has been referred to the Physical Research Committee for opinion.
VI	<i>Subject :</i> Electron-diffraction Studies of Semi-conductor Rectifiers and Development of Copper Oxide Triode by Prof. K. R. Dixit, Head of the Physics Department, Institute of Science, Bombay. <i>Object :</i> The aims of the scheme are :— (i) to determine experimentally the thickness of the barrier layer in the copper oxide rectifiers, and to study the nature of this layer by electron diffraction, and (ii) with this knowledge to construct a copper oxide triode. <i>Scope :</i> Work on rectifiers has been carried out in U. K. and U. S. A. but details are not available. Bardeen and Brattain have developed germanium triode in which contacts are made by pointed wire, hence power output is low. <i>Author's record :</i> Prof. Dixit has observed that rectification is improved about five times by introducing foreign substances in mother copper. An electron-diffraction camera, high vacuum metal evaporation apparatus and vacuum furnace have been built up in Dr. Dixit's laboratory, and preliminary work has been completed. A few rectifiers prepared showed rectification as high as 40. <i>Duration :</i> The first part of the scheme which will be taken up now is expected to go for 2 years.

Recommendations of the Committee of the Board	Recommendations of the Board
V. p. 5-7. The Committee noted that the Physical Research Committee had recommended that the investigator be asked to send a more specific problem to be considered by the Research Committee in their next meeting (vide Proceedings of the Research Committee item (vi), p. 117 of the Supplementary Agenda). The Committee endorsed the recommendation of the Research Committee.	V. p. 5-7. The Board endorsed the recommendation of the Research Committee.

RESEARCH SCHEMES

Item No.	Particulars.
VII	Grant asked for :
	Equipment Nil
	Contingencies Rs. 750
	(nickel, molybdenum, German silver discs etc.)
	Staff : Rs. 4,230 (including allowances).
	(One S. S. A.)
	Total Rs. 4,980 (including allowances).
	Research Committee's recommendation :
	The scheme has been referred to the Physical Research Committee and the Radio Research Committee for opinion.
	Subject : Study of Absorption and Dielectric Properties in the Microwave Region by Dr. P. N. Sharma, Professor of Physics, Lucknow University.
	Object & Scope :
	The object of this scheme is to assess the suitability of some organic compounds and plastics (both imported and indigenous) as dielectrics for condensers by investigating the dielectric and absorption loss and determining their molecular structure and dipole moments.
	The dielectric properties of substances have been studied in detail in U. K. & U. S. A. but no work with reference to substances of Indian origin has been done.
	Lack of knowledge about materials of indigenous origin has stood in the way of their utilisation in the Radio Industry.
	Collaboration :
	Mr. M. C. Saxena, Lecturer in Physics will collaborate.
	Duration :
	The scheme will take three years for completion.
	Grant asked for :
	Equipment ... Nil
	Contingencies ... Rs. 1,000
	Staff ... Rs. 3,420 (including allowances)
	(One J. S. A. on Rs. 200/- p.m.)
	Total Rs. 4,420 (including allowances)
	[In the second year equipment worth Rs. 14,500/- will be required : one 1.5 cm oscillato waveguide meters, frequency meters and detectors].
	Research Committee's recommendation :
	The scheme has been referred to the Radio Research Committee for opinion.

Recommendations of the Committee of the Board.	Recommendations of the Board.
VI. p. 7-9. The Committee noted that the Physical Research and the Radio Research Committees had recommended the scheme (vide proceedings of the Physical Research Committee and Radio Research Committee item 3(ii), p. 115 and item 3 (ii) p. 123, respectively of the Supplementary Agenda). The Committee recommended that the Research Scheme on Electro-diffraction Studies of Semi-conductor Rectifiers by Dr. Dixit be approved and the following grant be made (upto the end of current financial year) :— Equipment Nil Contingencies Rs. 500 Staff : Rs. 1,804 (including allowances) (One S.S.A.). Total Rs. 2,304 (including allowances)	VI. p. 7-9. The Board endorsed the recommendation of its Committee.
VII. p. 9. The Committee noted that the Research Scheme on Absorption and Dielectric Properties in the Micro-waves Region by Dr. P. N. Sharma had been recommended by the Radio Research Committee (vide proceedings of the Radio Research Committee item (iii), p. 125 of the Supplementary Agenda). The Committee recommended the scheme for sanction with the following grant (upto the end of current financial year) :— Equipment Rs. 3,000 Contingencies Rs. 750 Staff : Rs. 2,050 (including allowances) (One J. S. A. & One Mechanic). Total Rs. 5,800 (including allowances) It was also recommended that Dr. Sharma be requested to concentrate on materials of indigenous origin.	VII. p. 9. The Board endorsed the recommendations of its Committee.

RESEARCH SCHEMES

Item No.	Particulars										
VIII	Subject : Study of Atmospheric Radio Activity at Allahabad by Dr. G. B. Deodhar, Physics Department, Allahabad University. <i>Object and Scope :</i> The object of the scheme is to obtain more knowledge of atmospheric radio activity at Allahabad. The investigation will cover all seasons. It is later intended to extend it to higher altitudes. The investigation may also be correlated with similar variations in atmospheric electricity and cosmic rays. An aeroplane will be required when observations at higher altitudes are taken. <i>Duration :</i> The scheme is expected to take about two years at Allahabad in the first instance. <i>Grant asked for :</i> <table> <tr> <td>Equipment</td><td>... Nil</td></tr> <tr> <td>Contingencies</td><td>... Rs. 500</td></tr> <tr> <td>Staff</td><td>... Rs. 2,940 (including allowances.)</td></tr> <tr> <td>(One J. S. A. on Rs. 160 p.m.)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 3,440 (including allowances.)</td></tr> </table> <i>Research Committee's recommendation :</i> The scheme has been referred to the Atmospheric Research Committee for opinion.	Equipment	... Nil	Contingencies	... Rs. 500	Staff	... Rs. 2,940 (including allowances.)	(One J. S. A. on Rs. 160 p.m.)		Total	Rs. 3,440 (including allowances.)
Equipment	... Nil										
Contingencies	... Rs. 500										
Staff	... Rs. 2,940 (including allowances.)										
(One J. S. A. on Rs. 160 p.m.)											
Total	Rs. 3,440 (including allowances.)										
IX	Subject : Combustion of Pulverized Coal by Dr. B. Ghosh, Assistant Professor of Chemical Engineering, College of Engineering and Technology, Calcutta. <i>Object :</i> The object of the scheme is to study the ignition characteristics of Indian coals in pulverized form. <i>Scope :</i> The effect of the following variables on the ignition time of pulverized coal will be investigated (i) volatile matter content (ii) ash content (iii) furnace temperature (iv) fuel ratio (v) rate of fuel feed. The data obtained may also find application in the design of pulverized coal burners.										

Recommendations of the Committee of the Board	Recommendations of the Board
VIII. p. 11. The Committee noted that the opinion of the Atmospheric Research Committee was awaited. It was recommended that the D.S.I.R. be authorised to take necessary action departmentally on receipt of the Research Committee's opinion.	VIII. p. 11. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars																		
	While performance data on the combustion of pulverized coal in industrial furnaces is available, the fundamental aspects of the problem have been only partially investigated. <i>Author's work :</i> Dr. Ghosh has investigated the behaviour of American coals in small flames at the Coal Research Laboratory, Pittsburgh, U. S. A. under Drs. Orning & Lowry. It is proposed to extend this work to Indian Coals. <i>Duration :</i> The scheme is expected to take a minimum of two years. <i>Grant asked for :</i> <table><tr><td>Equipment</td><td>...</td><td>Rs. 1,500</td></tr><tr><td>(Furnace, coal feeding unit etc.)</td><td></td><td></td></tr><tr><td>Contingencies</td><td>...</td><td>Rs. 1,000</td></tr><tr><td>Staff</td><td>...</td><td>Rs. 2,940 (including allowances)</td></tr><tr><td>(One J. S. A. on Rs. 160 p.m.)</td><td></td><td></td></tr><tr><td>Total</td><td>...</td><td>Rs. 5,440 (including allowances)</td></tr></table> <i>Research Committee's recommendation :</i> Dr. B. Ghosh had submitted a scheme on this subject earlier but was not accepted as it was considered too vague. As desired by the BSIR (November 1952) he was requested to submit a more concrete scheme. The scheme has been referred to the Fuel Research Committee for opinion.	Equipment	...	Rs. 1,500	(Furnace, coal feeding unit etc.)			Contingencies	...	Rs. 1,000	Staff	...	Rs. 2,940 (including allowances)	(One J. S. A. on Rs. 160 p.m.)			Total	...	Rs. 5,440 (including allowances)
Equipment	...	Rs. 1,500																	
(Furnace, coal feeding unit etc.)																			
Contingencies	...	Rs. 1,000																	
Staff	...	Rs. 2,940 (including allowances)																	
(One J. S. A. on Rs. 160 p.m.)																			
Total	...	Rs. 5,440 (including allowances)																	
X	Subject : Installation of Auxiliary Units to the 25 ton/day Lurgi Low Temperature Carbonisation Plant by the Director, Central Laboratories, Hyderabad. <i>Note :</i> The Director, Central Laboratories Hyderabad, has sent a composite scheme for setting up the following units as adjuncts to the Lurgi Low Temperature Carbonisation Plant for Indian Coals now under installation in the Central Laboratories: (i) 3 ton/day tar distillation plant. (ii) 100 lbs./day ammonia recovery plant. (iii) 75 gallons/day benzole recovery plant. (iv) electro tar precipitator.																		

Recommendations of the Committee of the Board.	Recommendations of the Board.
IX. p. 11-13. The Committee noted that the Research Scheme would be considered by the Fuel Research Committee at its meeting to be held on the 5th October, 1953. The Committee recommended that the D.S.I.R. be authorised to take necessary action departmentally on receipt of the recommendation of the Fuel Research Committee.	IX. p. 11-13. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars
	In forwarding the scheme he says, "With the grant of approximately Rs. 10 lakhs made available by the Industrial Trust Fund, Hyderabad, Deccan, the Central Laboratories for Scientific & Industrial Research, Hyderabad, Deccan, is installing a 25 ton/day Lurgi plant for studying the low temperature carbonisation properties of non-caking coals on a semi-commercial scale. The plant is expected to go into production sometime in the middle of the current year and will then be producing per day about 20 tons of smokeless fuel, 300 gallons of tar and 350 gallons of ammoniacal liquor. While the smokeless fuel can be sold as domestic fuel it is necessary to put auxiliary units like the tar distillation unit, ammonia recovery unit, benzole recovery unit, electrode-tarrer for further processing the products of carbonisation. This would be possible only if a non-recurring grant of Rs. 4.5 lakhs and a recurring grant for two years of Rs. 18,000 is made available. The Industrial Trust Fund, Hyderabad, Deccan is not in a position to advance this amount due to financial stringency but since this project will be of All India importance it is requested that the Council may make available the above grant". (i) <i>Subject : 3 ton a day tar distillation unit.</i> <i>Aim & Scope :</i> Tar is one of the main products of low temperature coal carbonisation expected to be produced at the rate of 300 gallons per day in the Lurgi Plant set up in the Central Laboratories, Hyderabad. The proposed installation will enable the processing of the tar distillate into light oil, middle oil, heavy oil and pitch fractions and consequently provide (i) enough data for design of a larger unit (ii) suitable fractions for further work on hydrogenation and fractional distillation and (iii) systematic analysis of low temperature tars from various non-caking Indian coals. Laboratory scale trials on distillation of tars from Hyderabad coals both under normal and reduced pressure have been conducted at the Central laboratories and sufficient data has been collected. On that basis the 3 ton per day capacity pot-still with a fractionating column operating under reduced pressure is expected to be an economic unit. The products expected to be recovered from distillation of tar per day are light oil 5 gallons, middle oil 30 gallons, heavy oil 106 gallons and pitch 1.4 tons. Equipment for carrying out tests on the products is available in the Central Laboratories. The work is expected to be continuous and the plant is expected to pay its working costs.

Recommendations of the Committee of the Board	Recommendations of the Board

RESEARCH SCHEMES

Item No.	Particulars
	<i>Grant asked for :</i>
	Equipment ... Rs. 80,000 (Purchase & installation of unit)
	Contingencies ... Rs. 30,000 (Working cost for the first three months)
	Staff ... Nil
	Total ... Rs. 1,10,000
(ii)	Subject : Ammonia Recovery Unit.
	<i>Object & Scope :</i>
	The object is to set up an ammonia recovery unit as an auxiliary unit to the Lurgi plant. About 350 gallons of ammoniacal liquor is expected to be obtained as a by-product in the plant. This may lead to the recovery of about 100 lbs. liquor ammonia 30%.
	A process for recovery of liquor ammonia from ammoniacal liquor of the Lurgi plant on laboratory scale has been worked out at the Central Laboratories.
	The plant is expected to run continuously on a semi-commercial scale on the return from sales of ammonia after the first three months.
	<i>Grant asked for :</i>
	Equipment ... Rs. 70,000 (Purchase & installation of the unit)
	Contingencies ... Rs. 10,000 (Working expenses for the first three months)
	Staff ... Nil
	Total ... Rs. 80,000
(iii)	Subject : Benzole Recovery Unit.
	<i>Object :</i>
	It is proposed to instal a benzole recovery unit for processing about 75 gallons of crude benzole expected to be obtained as by-product from the Lurgi plant and refining it for use as motor fuel.
	The plant will comprise an iron oxide bed for removal of sulphur and the benzole recovery plant complete with scrubbing and refining unit. The unit will provide sufficient

Recommendations of the Committee of the Board	Recommendations of the Board

Item No.	Particulars												
	data as to the nature of benzol recoverable from the various Indian coals and information on the economic feasibility of benzole recovery. It may be possible to design and fabricate larger capacity units on the experience gained. The analysis and study of properties of benzole recovered from Hyderabad coals has been undertaken in the Central Laboratories. Comparative studies of recovery of benzole on laboratory scale by absorption with activated carbon in static and fluidized state and counter current scrubbing are in progress. <i>Collaboration :</i> Help of the Fuel and Chemical Engineering sections will be available. <i>Duration :</i> The investigation is expected to take three years but sanction is requested for two years in the first instance. <i>Grant requested for the first year :</i> <table> <tr> <td>Equipment</td><td>... Rs. 2,00,000</td></tr> <tr> <td>(Purchase & installation of unit)</td><td></td></tr> <tr> <td>Contingencies</td><td>... Rs. 5,000</td></tr> <tr> <td>Staff</td><td>... Rs. 13,104 (including allowances)</td></tr> <tr> <td>(One S. S. A., one J. S. A., one Mechanic on Rs. 100 p.m., one Mechanic on Rs. 60 p.m. and three unskilled labourers on Rs. 20 p.m.)</td><td></td></tr> <tr> <td></td><td>... Rs. 2,18,104 (including allowances)</td></tr> </table> (iv) <i>Subject :</i> Electro-Tar Precipitator of 5 million cuf. ft. per day capacity. <i>Object & Scope :</i> It is proposed to instal an electro-tar precipitator for improving the efficiency of the condensing system of the Lurgi plant by elimination of tar fog at any desired point on the gas stream. Tar fog obstructs the recovery of ammonia by rendering the washers ineffective by filming the scrubbing surfaces and giving rise to pressure loss necessitating frequent cleaning. It contributes to sluggish tendencies of benzole wash oils, causing difficulties in the direct and semi-direct process of ammonia recovery. The unit will increase the recovery yield of dry tar and reduce higher tar acids content of the liquor.	Equipment	... Rs. 2,00,000	(Purchase & installation of unit)		Contingencies	... Rs. 5,000	Staff	... Rs. 13,104 (including allowances)	(One S. S. A., one J. S. A., one Mechanic on Rs. 100 p.m., one Mechanic on Rs. 60 p.m. and three unskilled labourers on Rs. 20 p.m.)			... Rs. 2,18,104 (including allowances)
Equipment	... Rs. 2,00,000												
(Purchase & installation of unit)													
Contingencies	... Rs. 5,000												
Staff	... Rs. 13,104 (including allowances)												
(One S. S. A., one J. S. A., one Mechanic on Rs. 100 p.m., one Mechanic on Rs. 60 p.m. and three unskilled labourers on Rs. 20 p.m.)													
	... Rs. 2,18,104 (including allowances)												

Recommendations of the Committee of the Board	Recommendations of the Board

RESEARCH SCHEMES

Item No.	Particulars
	In other countries installation of electro-detarrers is a normal practice.
	Grant asked for :
	Equipment ... Rs. 60,000 (Purchase & installation of electro-detarrer)
	Contingencies ... Nil
	Staff ... Nil
	Total ... Rs. 60,000
	As an adjunct to the main plant it is expected to pay its own working cost.
XI	Subject : Systematic Audit of Fuel, Heat and Power in Industry in Hyderabad State by the Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn). Object and Scope : The object of this scheme is to carry out a systematic audit of fuel, heat and power of all types of industrial installations using coal in Hyderabad State. This will be done by following the material flow or by dealing with heat and power generation and distribution sequences in the installations, with a view to find out methods for increasing the fuel efficiency. A Mobile Testing Unit is proposed to be set up in the Central Laboratories, Hyderabad. Auditing will be done in close co-operation with the industries. Duration : The survey is expected to take three years in the first instance but may be extended to five. Equipment ... Rs. 35,000 (One Van with fittings and other equipment) Contingencies (including T A.) ... Rs. 6,000 Staff ... Rs. 16,120 (including allowances.) [Two S.S.A s (Fuel Technologists) on Rs. 250 p. m. Two Laboratory Assistants on Rs. 125 p. m. One Mechanic on Rs. 60 p. m. Two Kamatis on Rs. 20 p. m.)] Total Rs. 57,120 (including allowances.)

Recommendations of the Committee of the Board	Recommendations of the Board
X. p 13-21. The Committee noted that the Research Scheme would be considered by the Fuel Research Committee at its meeting to be held on the 5th October, 1953. The Committee recommended that the scheme along with the opinion of the Research Committee be placed before the next meeting of the B.S.I.R.	X. p. 13-21. The Board noted and endorsed the recommendation of its Committee.
XI. p. 21. The Committee noted that the Research Scheme would be considered by the Fuel Research Committee at its meeting to be held on the 5th October, 1953. The Committee recommended that the scheme along with the opinion of the Research Committee be placed before the next meeting of the B.S.I.R.	XI. p 21. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars								
XII	Subject : Catalytic Oxidation of Ammonia and the Verification of the 'General Theory of Residual Affinity Elucidating the Specific Nature of Catalysts' by Prof. S. Ghosh, Head of the Chemistry Department, Allahabad University. Object : It is proposed to study Ostwald's process of oxidation of ammonia to nitric acid with a view to avoid loss of nitrogen and fuller conversion of ammonia to nitrate. The oxidation would be attempted at ordinary temperature in the presence of catalyst in order to avoid the great rapidity of the reaction otherwise. The phenomenon of chemisorption, involving chemical valency forces between surface and adsorbed species will also be studied to investigate the range of chemisorption in which the surface will act as an efficient catalyst and conditions under which particular solid surface acts as a catalytic agent for a specific reaction, with the ultimate object of obtaining a more generalised conclusion to explain the specific heterogeneous reactions. Author's record : Dr. Ghosh and collaborators have shown that oxidation of hydrous chromous oxide to chromates by atmospheric oxygen, potassium persulphate and potassium permanganate etc. is greatly modified by its method of preparation. It is proposed to study the catalytic activity of three hydrous oxides in the oxidation of ammonia. Dr. Ghosh has also obtained a relation from the adsorption equation of Langmuir for calculating the binding forces that come into play for adsorption. Duration : The investigation will take five years for completion. Grant asked for : <table> <tr> <td>Equipment (Special glass apparatus)</td><td>... Rs. 1,500</td></tr> <tr> <td>Contingencies</td><td>.. Rs. 500</td></tr> <tr> <td>Staff (One J.S.A. Rs. 160 p.m.)</td><td>... Rs. 2,940 (including allowances)</td></tr> <tr> <td>Total</td><td>... Rs. 4,940 (including allowances)</td></tr> </table> Research Committee's recommendation : The opinion of the Chemical Research Committee to whom the scheme was referred, is that the lines of work proposed would merely add to the already overwhelming mass of absorption data which for lack of correlation can only have a comparatively minor ad hoc value. The scheme may be revised as suggested by Prof. G.I. Finch and the C.S.I.R. could consider it after the author has carried out some preliminary work on his own and indicated some progress.	Equipment (Special glass apparatus)	... Rs. 1,500	Contingencies	.. Rs. 500	Staff (One J.S.A. Rs. 160 p.m.)	... Rs. 2,940 (including allowances)	Total	... Rs. 4,940 (including allowances)
Equipment (Special glass apparatus)	... Rs. 1,500								
Contingencies	.. Rs. 500								
Staff (One J.S.A. Rs. 160 p.m.)	... Rs. 2,940 (including allowances)								
Total	... Rs. 4,940 (including allowances)								

Recommendations of the Committee of the Board	Recommendations of the Board
XII. p. 23. The Committee recommended that Prof. S. Ghosh be requested to submit a revised scheme on the lines suggested by Prof. Finch after carrying out some preliminary work on his own.	XII. p. 23. The Board endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars								
XIII	Subject : Pilot Plant Activation of Bauxite by the Director, Central Laboratories for Scientific and Industrial Research, Hyderabad (Dn.) Object : The object of this scheme is to carry out pilot plant scale investigation on the preparation of three forms of activated bauxite for (a) bleaching of oils (b) accelerated heat bodying and (c) isomerising, particularly for (a). The pilot plant proposed to be set up will process 1 cwt. of raw material per hour yielding about 56 lbs. of finished product. In the initial stages the plant will be worked for only 2 cwt. of activated product per day but the output will be slowly increased as more experience is gained. The activated bauxite, utilising raw bauxite at Rs. 30 per ton, is estimated to cost Rs. 526 as against the current market price of imported activated Fuller's earth at Rs. 800 to Rs. 1,000 per ton. India's consumption of Fuller's earth mainly in the vanaspati industry is estimated at 4000 to 7000 tons per year costing a minimum of Rs. 40 lakhs. Replacement of this by indigenous activated bauxite would be in the interest of the country's economy. Activated bauxite can also find utilisation in stand oil manufacture as catalyst and as an isomerising agent. Author's record : Dr. Saletore, who will be incharge of the investigation, has worked out laboratory scale activation of bauxite at the Laxminarayan Technological Institute, Nagpur in a scheme financed by the Council of Scientific and Industrial Research. The results are covered by Indian Patents No. 39320, 45840 and 45841. Duration : The investigation will take one year. Grant asked for : <table> <tr> <td>Equipment (One rotary furnace and auxiliaries).</td> <td>... Rs. 60,000</td> </tr> <tr> <td>Contingencies (Materials and labour)</td> <td>... Rs. 7,440</td> </tr> <tr> <td>Staff (One S.S.A. on Rs. 250 p. m. One Mechanic on Rs. 60 p m.)</td> <td>... Rs. 5,520 (including allowances)</td> </tr> <tr> <td>Total</td> <td>Rs. 72,960 (including allowances)</td> </tr> </table> Research Committee's recommendation : The scheme has been referred to the Vegetable Oils Research Committee for opinion.	Equipment (One rotary furnace and auxiliaries).	... Rs. 60,000	Contingencies (Materials and labour)	... Rs. 7,440	Staff (One S.S.A. on Rs. 250 p. m. One Mechanic on Rs. 60 p m.)	... Rs. 5,520 (including allowances)	Total	Rs. 72,960 (including allowances)
Equipment (One rotary furnace and auxiliaries).	... Rs. 60,000								
Contingencies (Materials and labour)	... Rs. 7,440								
Staff (One S.S.A. on Rs. 250 p. m. One Mechanic on Rs. 60 p m.)	... Rs. 5,520 (including allowances)								
Total	Rs. 72,960 (including allowances)								

Recommendations of the Committee of the Board	Recommendations of the Board
XIII. p. 25. The Committee noted that the opinion of the Vegetable Oils Research Committee on the scheme had not yet been received. It was recommended that the scheme along with the opinion of the Research Committee be placed before the Board at its next meeting.	XIII. p. 25. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Particulars

Subject : Activation of Hyderabad Earths for Bleaching of Oils on Pilot Plant Scale by the Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn).

Object :

The object of this scheme is to carry out pilot plant investigation on the activation of diatomaceous earths of Hyderabad (Srirangapur and Gingurti Taluks) for use as substitute for imported activated Fuller's earth as bleaching agent for vegetable oils.

The process comprises grinding and levigation for preliminary purification, digestion with mineral acids and activation in rotary muffle (1 cwt capacity).

Authors' Record :

Laboratory scale investigations carried out at the Central Laboratories, Hyderabad, by Dr. Saletore & S. S. Joshi have indicated that while activated earths from Srirangpur clays are comparable with imported Fuller's earth in bleaching efficiency, those from Gingurti are even superior.

Calcium chloride is also obtained as a bye-product in the case of Gingurti earths.

The activated earths are estimated to cost about Rs. 650 per ton as against Rs. 800 to 1000 per ton for imported activated Fuller's earth. India's consumption is 4000-7000 tons per annum.

The scheme will be under Dr. Saletore's direction.

Duration :

The scheme is expected to take one year.

Grant asked for :

Equipment (If the scheme on activation of bauxite is sanctioned, the same equipment can be used)	...	Nil
Contingencies (Materials and labour charges)	...	Rs. 6,000
Staff (One S.S.A. on Rs. 250 p.m. One Mechanic on Rs. 60 p.m. Two Washermen)	...	Rs. 7,440 (including allowances)
Total	...	<u>Rs. 13,440 (including allowances)</u>

Sale of the produce may cover the cost of raw material.

Research Committee's recommendation :

The scheme has been referred to the Vegetable Oils Research Committee for opinion.

Recommendations of the Committee of the Board	Recommendations of the Board
XIV. p. 27. The Committee noted that the opinion of the Vegetable Oils Research Committee on the scheme had not yet been received. It was recommended that the scheme along with the opinion of the Research Committee be placed before the Board at its next meeting.	XIV. p. 27. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Particulars									
Subject : Pilot Plant Production of Fatty Acids by the Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn). Object : The object of this scheme is to investigate on pilot plant scale (50 lbs capacity) production of tailored fatty acids to suit the needs of specific industrial processes such as pure ricinoleic acid, oleic and linoleic acids, linoleic rich products, and other saturated acids. These acids are used in candle making, shaving soaps, vanishing creams, rubber compositions etc. Plan of work : The investigation will comprise splitting of oils, isolation and purification of the acids by methods suitable for individual cases such as solvent separation or urea method, in association with vacuum distillation as necessary Work already done : Achaya and Saletore in laboratory scale experiments at the Central Laboratories, Hyderabad, have obtained ricinoleic acid of 98.99% purity by differential solvent extraction of castor oil; oleic acid and linoleic acid of high purity have also been obtained by employing the urea-adduct method. But pilot plant trials are necessary before work on industrial scale could be taken up. Direction and duration : The investigation will be under the guidance of Dr. S. A. Saletore and will take 3 years. Grant asked for : <table> <tr> <td>Equipment (continuous counter current extraction unit, fat splitting unit 50 lbs capacity, urea fatty acid separation plant, vacuum distillation plant, auxiliaries and cost of erection.)</td><td>Rs. 60,000</td></tr> <tr> <td>Contingencies</td><td>... Rs. 5,000</td></tr> <tr> <td>Staff (One S.S.A. on Rs. 250 p.m. One J.L.A. on Rs. 60 p.m.)</td><td>... Rs. 5,580 (including allowances)</td></tr> <tr> <td>Total</td><td>Rs. 70,580 (including allowances)</td></tr> </table> Research Committee's recommendation : The scheme has been referred to the Vegetable Oil, Research Committee for opinion.		Equipment (continuous counter current extraction unit, fat splitting unit 50 lbs capacity, urea fatty acid separation plant, vacuum distillation plant, auxiliaries and cost of erection.)	Rs. 60,000	Contingencies	... Rs. 5,000	Staff (One S.S.A. on Rs. 250 p.m. One J.L.A. on Rs. 60 p.m.)	... Rs. 5,580 (including allowances)	Total	Rs. 70,580 (including allowances)
Equipment (continuous counter current extraction unit, fat splitting unit 50 lbs capacity, urea fatty acid separation plant, vacuum distillation plant, auxiliaries and cost of erection.)	Rs. 60,000								
Contingencies	... Rs. 5,000								
Staff (One S.S.A. on Rs. 250 p.m. One J.L.A. on Rs. 60 p.m.)	... Rs. 5,580 (including allowances)								
Total	Rs. 70,580 (including allowances)								

Recommendations of the Committee of the Board	Recommendations of the Board
XV. p. 29. The Committee noted that the opinion of the Vegetable Oils Research Committee on the scheme had not yet been received. It was recommended that the scheme along with the opinion of the Research Committee be placed before the Board at its next meeting.	XV. p. 29. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars												
XVI	Subject : New Sources of Edible Oils by Dr. M. A. Aziz, Reader in Chemistry, Muslim University, Aligarh. Object & Scope : The object of this scheme is to investigate seeds of two hedge plants growing locally as sources of edible oil. The work will include (i) complete chemical examination of the seed fats, (ii) study of suitability of the fats for human consumption and seed cake as cattle feed, and (iii) investigation of other possible uses of the products. Author's record : Preliminary study of the two hedge plants by the author gave an oil content of 6%. Even with the low fat content they may be of interest to national economy in the present shortage of edible fats. Duration : The scheme will take one year (six months for each type of seed). Grant asked for : <table><tr><td>Equipment</td><td>...</td><td>Nil</td></tr><tr><td>Contingencies (apparatus etc.).</td><td>...</td><td>Rs. 3,000</td></tr><tr><td>Staff (One S. S. A. on Rs. 250 p.m. One Lab. Boy on Rs. 40 p.m.)</td><td></td><td>Rs. 5,160 (including allowances)</td></tr><tr><td></td><td>Total</td><td>Rs. 8,160 (including allowances)</td></tr></table> Research Committee's recommendation : The scheme has been referred to the Vegetable Oils Research Committee for opinion.	Equipment	...	Nil	Contingencies (apparatus etc.).	...	Rs. 3,000	Staff (One S. S. A. on Rs. 250 p.m. One Lab. Boy on Rs. 40 p.m.)		Rs. 5,160 (including allowances)		Total	Rs. 8,160 (including allowances)
Equipment	...	Nil											
Contingencies (apparatus etc.).	...	Rs. 3,000											
Staff (One S. S. A. on Rs. 250 p.m. One Lab. Boy on Rs. 40 p.m.)		Rs. 5,160 (including allowances)											
	Total	Rs. 8,160 (including allowances)											
XVII	Subject : Stability and Component Fatty Acids in Hydrogenated Fats by Dr. N. G. Magar, Institute of Science, Bombay. Object : The object of this scheme is to study the component fatty acids of hydrogenated products and their stability. Scope : The plan of work includes : (i) selection of the hydrogenated fats;												

Recommendations of the Committee of the Board	Recommendations of the Board
XVI. p. 31. The Committee noted that the opinion of the Vegetable Oils Research Committee on the scheme was not yet available. It was recommended that the D.S.I.R. be authorised to take necessary action departmentally on its receipt.	XVI. p. 31. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars															
	(ii) study of their stability by the standard A.O.M. method; (iii) component fatty acid analysis by (a) low temperature crystallisation (b) isomerization and absorption spectra in the ultraviolet for linoleic and linolenic acids (c) presence and extent of different iso-oleic acids by Benedict and Daubert's method (lead and mercury salt separation); (iv) storage studies by storing samples at room temperature and at 37°C in different containers for varying periods upto one year, using Kreis test and acid value tests and organoliptic tests for taste and smell in conformity with A.O.C.S. standards for soyabean oil. Benedict and Daubert and Patwardhan have demonstrated the presence of different iso-oleic acids in hydrogenated fats. The stability of the hydrogenated fats would be affected by the presence of saturated and unsaturated acids in different proportions. Grant asked for : <table><tr><td>Equipment</td><td>...</td><td>Nil</td></tr><tr><td>Contingencies</td><td>..</td><td>Rs 600</td></tr><tr><td>Staff</td><td>...</td><td>Rs. 3,060 (including allowances)</td></tr><tr><td colspan="3">(One J.S.A. Rs. 160 p.m.)</td></tr><tr><td>Total</td><td>...</td><td>Rs. 3,660 (including allowances)</td></tr></table> Research Committee's recommendation : A research scheme on the same subject received earlier from Dr. Magar was considered by the B.S.I.R. in the meeting held on 19.3.1952 and in accordance with the recommendation was referred back to the Vegetable Oils Research Committee for reconsideration in the light of the work already in progress under the purview of the Vanaspati Research Committee. The present scheme deals with the modified programme of work drawn up on the basis of the comments of the members of the Vegetable Oils Research Committee and the work under the Vanaspati Research Committee. The Vegetable Oils Research Committee has recommended the revised scheme for sanction. Subject : Development of Rose Oil Industry in India(Chemical Aspects)by Dr. D.R. Dhingra Principal, Hartcourt Butler Technological Institute, Kanpur. Note : The Essential Oils Research Committee at its meeting held in December 1952, while considering the future programme of research on essential oils in India, recommended that	Equipment	...	Nil	Contingencies	..	Rs 600	Staff	...	Rs. 3,060 (including allowances)	(One J.S.A. Rs. 160 p.m.)			Total	...	Rs. 3,660 (including allowances)
Equipment	...	Nil														
Contingencies	..	Rs 600														
Staff	...	Rs. 3,060 (including allowances)														
(One J.S.A. Rs. 160 p.m.)																
Total	...	Rs. 3,660 (including allowances)														
XVIII																

Recommendations of the Committee of the Board	Recommendations of the Board										
XVII. p. 31-33. The Committee recommended that the Research Scheme on Stability and Component Fatty Acids in Hydrogenated Fats by Dr. Magar be approved and the following grant be sanctioned (upto the end of current financial year) :— <table> <tr> <td>Equipment</td><td>Nil</td></tr> <tr> <td>Contingencies</td><td>Rs. 300</td></tr> <tr> <td>Staff :</td><td>Rs. 1,275 (including allowances)</td></tr> <tr> <td colspan="2">(One J.S.A. on Rs. 160 p.m.)</td></tr> <tr> <td>Total</td><td>Rs. 1,575 (including allowances)</td></tr> </table>	Equipment	Nil	Contingencies	Rs. 300	Staff :	Rs. 1,275 (including allowances)	(One J.S.A. on Rs. 160 p.m.)		Total	Rs. 1,575 (including allowances)	XVII. p. 31-33. The Board endorsed the recommendation of its Committee.
Equipment	Nil										
Contingencies	Rs. 300										
Staff :	Rs. 1,275 (including allowances)										
(One J.S.A. on Rs. 160 p.m.)											
Total	Rs. 1,575 (including allowances)										

RESEARCH SCHEMES

Item No.	Particulars
	investigations connected with the development of rose oil industry should be located at the Hartcourt Butler Technological Institute, Kanpur.
	Dr. K. Biswas, Superintendent, Sitapur Botanical Garden has a scheme under the auspices of the Essential Oils Research Committee dealing with survey of the rose industry in India. Work under this scheme has been nearly completed. The B. S. I. R. on the recommendation of the Essential Oils Research Committee decided at their last meeting that further research connected with the rose industry should be on the developmental aspects of the industry and that it should be taken up in collaboration with the Hartcourt Butler Technological Institute at Kanpur.
	In the meanwhile the Council has taken over the Sikanderbagh Garden at Lucknow which is being developed as a National Botanical Garden. Facilities are hence available at Lucknow for investigations on the botanical aspects of the industry.
	On the advice of the Chairman, Essential Oils Research Committee, Dr. Dhingra, Principal of the Hartcourt Butler Technological Institute, and Prof. K. N. Kaul, Director of the National Botanical Garden, have discussed the lines on which research on the developmental aspects of rose industry could be taken up in collaboration. Dr. Dhingra has submitted the following scheme dealing with the chemical aspects.
	Programme of work :
	(i) study of the yield of the oil or otto from the various types of rose flowers grown in the National Botanical Gardens in different seasons.
	(ii) examination of the rose oils so prepared physically and chemically with a view to draw out specifications and to study their characteristic properties.
	(iii) improvement in the methods of extraction of rose oils from roses.
	Grant asked for (upto end of 1953-54).
	Equipment ... Nil
	Contingencies ... Rs. 1,278
	Staff ... Rs 5,380 (including allowances)
	(One J. S. A. on Rs. 200 p.m. One Lab. Assistant, One Field Attendant)
	Total ... 7,158 (including allowances)
	Research Committee's recommendation :
	The scheme has been referred to the Essential Oils Research Committee for opinion. The detailed programme of Prof. Kaul dealing with the botanical aspects is awaited.

Recommendations of the Committee of the Board	Recommendations of the Board
XVIII. p. 33-35. The Committee recommended that the D.S.I.R. be authorised to take necessary action departmentally on receipt of the opinion of the Essential Oils Research Committee.	XVIII. p. 33-35. The Board endorsed the recommendation of its Committee,

RESEARCH SCHEMES

Item No.	Particulars																		
XIX	Subject : Studies into the Physiology and Ecology of Palm Trees with a view to Enhance the Quality and Quantity of Juice for the Manufacture of Sugar and Gur by Prof. T.C.N. Singh, Head of the Department of Botany, Annamalai University. Object and Scope : The object is to enhance the quality (composition) and quantity of palm juice. The programme of work will comprise— (a) correlation of the edaphic and other ecological factors in relation to growth of palm trees. (b) effect of trace elements, hormones and other suitable minerals in the metabolism of palm trees. (c) effect of the above by bottle-feeding the trunk of live palm trees and also by that of traumatism. (d) the vascular system and their correlation with the yield of juice. Collaboration : The scheme has been submitted as a result of discussion between the author, Mr. B.C. Joshi, Principal of the Central Palm Gur Training School, Cuddalore, and the Palm Gur Adviser to the Government of India. The advice and help of these officers would be available. Duration : The scheme is for three years in the first instance. Grant asked for : <table> <tr> <td>Equipment</td><td>Nil</td></tr> <tr> <td>Contingencies</td><td>Rs. 1,760</td></tr> <tr> <td>(including T.A.)</td><td></td></tr> <tr> <td>Staff: (for eight months only)</td><td>Rs. 1,685 (including allowances)</td></tr> <tr> <td>(One J.S.A. on</td><td></td></tr> <tr> <td>Rs. 160 p. m.</td><td></td></tr> <tr> <td>One Tapper on</td><td></td></tr> <tr> <td>Rs. 60 p. m.)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 3,445 (including allowances)</td></tr> </table> Research Committee's recommendation : The scheme has been referred to the Biochemical Research Committee for opinion.	Equipment	Nil	Contingencies	Rs. 1,760	(including T.A.)		Staff: (for eight months only)	Rs. 1,685 (including allowances)	(One J.S.A. on		Rs. 160 p. m.		One Tapper on		Rs. 60 p. m.)		Total	Rs. 3,445 (including allowances)
Equipment	Nil																		
Contingencies	Rs. 1,760																		
(including T.A.)																			
Staff: (for eight months only)	Rs. 1,685 (including allowances)																		
(One J.S.A. on																			
Rs. 160 p. m.																			
One Tapper on																			
Rs. 60 p. m.)																			
Total	Rs. 3,445 (including allowances)																		

Recommendations of the Committee of the Board	Recommendations of the Board
XIX. p. 37. The Committee noted that the Biochemical Research Committee was of the opinion that the scheme fell under the purview of the Indian Council of Agricultural Research. The Committee recommended that the Research Scheme by Prof. T.C.N. Singh be referred to the I.C.A.R. for consideration.	XIX. p. 37. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars
XX	Subject :—Preservation of Neera and Jaggery by Dr. V. P. Nair, Director of Industries & Commerce, Travancore-Cochin, Trivandrum. Object : The objects of this scheme are to investigate (i) the preservation of neera with a view to popularising it as a beverage and (ii) preservation of jaggery and development of an ideal method for its manufacture. The scheme has been submitted at the instance of and after discussion with the Palm Gur Adviser to the Government of India. Scope : The lines of investigation proposed to be followed are : — (a) Neera : (i) investigation of the optimum conditions for preservation of Neera with hexamine and its derivatives and the minimum quantity required. It is hoped that the pharmacological and toxicological work, if any, will be taken up by the Central Drug Research Institute at Lucknow. (ii) synthesis of substances similar in constitution to hexamine and derivatives of hexamine which may be effective for the preservation of Neera. (It is presumed that the structural configuration of hexamine is responsible for the preservation of Neera. It is claimed that no hydrolysis takes place during preservation). (iii) preservation experiments with non-toxic herbs. (b) Jaggery : (i) analytical studies on the minor components of jaggery available in the local market with a view to identifying the cause of leaching during monsoon. (ii) preservation experiments of jaggery including ideal methods of manufacture of jaggery excluding the cause of wetting. Some work on the nature, composition and preservation of Neera has been done by Mr. D. C. Walawalker, Indian Institute of Sugar Technology, Kanpur, and published (Palm Jaggery Bulletin Vol. 2, No. 1, p. 4) advocating use of sulphanilamide at a high pH. Author's record : Investigation already carried out under the guidance of Dr. V. P. Nair has shown that Neera containing 0.1% hexamine after carbonation can keep well for long periods Experts of Haffkine Institute are of opinion that the preservative action of hexamine is due to the formation of formalin by hydrolysis and as such hexamine should not be used as preservative The author's view is that use of hexamine in alkaline solution as recommended precludes the possibility of hydrolysis.

Recommendations of the Committee of the Board	Recommendations of the Board

RESEARCH SCHEMES

Item No.	Particulars								
	In the opinion of the Director, Central Drug Research Institute, "Hexamine by itself is not toxic. The decomposition of hexamine to formaldehyde could be averted by mild alkalinity. Since Neera is alkaline, under storage no decomposition will take place. But it may be decomposed by the acid reaction in the stomach. About 85% of the hexamine taken (0.9 gms day) will be excreted in the urine, although this is determined largely by the reaction that hexamine encounters in the digestive tract. Since Neera is carbonated also, there is only remote possibility of accumulative action in the system. In any event the use of hexamine appears to deserve further pharmacological and toxicological studies under actual conditions before its use as preservative is finally decided upon." <i>Collaboration :</i> The Department of Chemistry, Travancore University and the Public Health Laboratory, Travancore, will collaborate. <i>Duration :</i> The scheme is to run for two years in the first instance but extension to three may be necessary. <i>Grant asked for :</i> <table> <tr> <td>Equipment (evaporating pans, aerating machine with accessories).</td><td>Rs. 2,000 .</td></tr> <tr> <td>Contingencies (chemicals, apparatus and raw-materials)</td><td>Rs. 2,000</td></tr> <tr> <td>Staff : (One S. S. A. on Rs. 300 p. m. One Store Clerk on Rs. 75 p. m.)</td><td>Rs. 5,964 (including allowances.)</td></tr> <tr> <td>Total</td><td>Rs. 9,964 (including allowances.)</td></tr> </table> <i>Research Committee's recommendation :</i> The scheme has been referred to the Biochemical Research Committee and the Pharmaceuticals and Drugs Research Committee for opinion.	Equipment (evaporating pans, aerating machine with accessories).	Rs. 2,000 .	Contingencies (chemicals, apparatus and raw-materials)	Rs. 2,000	Staff : (One S. S. A. on Rs. 300 p. m. One Store Clerk on Rs. 75 p. m.)	Rs. 5,964 (including allowances.)	Total	Rs. 9,964 (including allowances.)
Equipment (evaporating pans, aerating machine with accessories).	Rs. 2,000 .								
Contingencies (chemicals, apparatus and raw-materials)	Rs. 2,000								
Staff : (One S. S. A. on Rs. 300 p. m. One Store Clerk on Rs. 75 p. m.)	Rs. 5,964 (including allowances.)								
Total	Rs. 9,964 (including allowances.)								

Recommendations of the Committee of the Board	Recommendations of the Board
XX. p. 39-41. The Committee noted that the views of the Research Committees had not yet come. It was recommended that the D.S.I.R. be authorised to take departmental action on the recommendation of the Research Committees.	XX. p. 39-41. The Board noted and endorsed the recommendation of its Committee

RESEARCH SCHEMES

Item No.	Particulars
XXI	Subject : Utilisation of Molasses by Director, Sugarcane Research and Development (Bihar State), Pusa, Bihar. Object : The object of the scheme is to investigate on pilot plant scale the manufacture of high grade edible syrups from molasses (both in sulphitation and carbination) by a process developed by Dr. A S Chakravarti at the Imperial College of Science and Technology, London. Scope : The process comprises :— (i) running a solution of molasses through columns of cation and anion exchange resins (with activated carbon treatment in between). (ii) concentration of the final purified and decolourised effluent to a suitable consistency. The product obtained is claimed to be a syrup of golden colour and agreeable flavour with a total sugar content of about 96% with raw ash and nitrogen content as low as 0.1%. The cost of treatment is estimated at one anna per lb. Its yield on original molasses material is about 65%. The ammonium sulphate from the chemicals used and potassic and nitrogenous matter removed from the molasses as by-products may provide valuable fertiliser thus reducing the cost of production. Bihar has surplus stock of molasses, about 4 lakh maunds available at cheap cost. The process would be economical. The Molasses and By-Product Sub-Committee of the Bihar State Sugar Conference held under the auspices of the Development Department of Bihar State had stressed the need of undertaking work on the utilisation of molasses, but the State Government due to financial stringency are not in a position to finance the scheme. Author's record : Dr. A.S. Chakravarti has worked on the utilisation of molasses at the Imperial College of Science, London. The scheme will be worked by him under the general control of the Director, Sugarcane Research and Development, Pusa, Bihar. Grant asked for : A block grant of Rs. 18,000 for one year has been requested. Research Committee's recommendation : The scheme has been referred to the Biochemical Research Committee for opinion.

Recommendations of the Committee of the Board	Recommendations of the Board
XXI. p.43 The Committee noted that the opinion of the Biochemical Research Committee was awaited. It was recommended that the D.S.I.R. be authorised to take necessary action departmentally on receipt of this.	XXI. p. 43. The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars															
XXII	Subject : Studies on Antifungal Antibiotics by Dr. S. K. Bose, Department of Biochemistry, University of Calcutta Object : Dr. Bose has isolated some strains of bacteria which inhibit the growth of moulds such as <i>Aspergillus niger</i>, <i>Penicillium notatum</i> etc. It is now proposed to study these bacteria for antifungal antibiotics. Scope : The plan of work will comprise— (i) search for antibiotic producing bacteria in various soils, fresh and rotten fruits and vegetables and composts. (ii) isolation and characterisation of the antagonists. (iii) determination of the anti-mould spectrum of the antagonists. (iv) selection of media for production of antibiotics. (v) isolation of antibiotic substances. Author's record. Preliminary investigations by the author have resulted in isolation of seven micro-organisms with lytic properties from rotten fruits and vegetables. Collaboration : Dr. S. C. Roy and Dr. D. K. Roy will collaborate. Duration : The investigation will take five years. Grant asked for : <table><tr><td>Equipment</td><td>...</td><td>Nil</td></tr><tr><td>Contingencies</td><td>...</td><td>Rs. 1,000</td></tr><tr><td>Staff</td><td>...</td><td>Rs. 4,230 (including allowances)</td></tr><tr><td>(One J.S.A. on Rs. 160 p.m. One Laboratory Attendant on Rs. 35 p.m.)</td><td></td><td></td></tr><tr><td colspan="2">Total</td><td>Rs. 5,230 (including allowances)</td></tr></table> Research Committee's recommendation : Dr. Bose had submitted a scheme on studies in the use of antibiotics in the storage of food grains some time back. The Biochemical Research Committee, who considered it, was of the opinion that the scheme was much too vague in conception since antibiotics were not likely to be used in any appreciable quantity for the preservation of food grains. The Research Committee recommended that the investigator may resubmit his scheme dealing only with a study of the antifungal antibiotics produced by bacteria isolated by him. The revised scheme has been referred to the Biochemical Research Committee for opinion.	Equipment	...	Nil	Contingencies	...	Rs. 1,000	Staff	...	Rs. 4,230 (including allowances)	(One J.S.A. on Rs. 160 p.m. One Laboratory Attendant on Rs. 35 p.m.)			Total		Rs. 5,230 (including allowances)
Equipment	...	Nil														
Contingencies	...	Rs. 1,000														
Staff	...	Rs. 4,230 (including allowances)														
(One J.S.A. on Rs. 160 p.m. One Laboratory Attendant on Rs. 35 p.m.)																
Total		Rs. 5,230 (including allowances)														

Recommendations of the Committee of the Board	Recommendations of the Board										
XXII. p. 45. The Committee noted that the Biochemical Research Committee had since recommended the scheme on condition that the investigation was directed towards confirming the antibiotics already isolated and study of their (a) cultural conditions for maximum elaboration (b) stability (c) isolation in pure form and valuation. The Committee recommended that the Research Scheme by Dr. S. K. Bose be approved and the following grant be sanctioned (upto end of financial year 1953-54) :— <table><tr><td>Equipment</td><td>Nil</td></tr><tr><td>Contingencies</td><td>Rs. 500</td></tr><tr><td>Staff:</td><td>Rs. 1,488 (including allowances)</td></tr><tr><td>(One J. S. A.)</td><td></td></tr><tr><td>Total</td><td>Rs. 1,988 (including allowances)</td></tr></table> It was also recommended that Dr. Bose be requested to follow the programme of work laid down by the Research Committee.	Equipment	Nil	Contingencies	Rs. 500	Staff:	Rs. 1,488 (including allowances)	(One J. S. A.)		Total	Rs. 1,988 (including allowances)	XXII. p. 45. The Board noted and endorsed the recommendations of its Committee.
Equipment	Nil										
Contingencies	Rs. 500										
Staff:	Rs. 1,488 (including allowances)										
(One J. S. A.)											
Total	Rs. 1,988 (including allowances)										

RESEARCH SCHEMES

Item No.	Particulars
XXIII	Subject : Virus Inhibition Studies by Dr. S. N. Das Gupta, Head of the Department of Botany, Lucknow University. Object : The object of the scheme is to find out therapeutic and preventive measures to inhibit the plant and animal viruses in the host cells, and to elucidate various aspects of the problem arising out of it. Scope & Programme : The programme of work to be done will comprise :— First Year : (i) direct virus inhibition studies in plant and animal systems, such as tobacco mosaic, influenza bacteriophage, etc. (ii) possibilities of the use of metabolites in altering the pathogenesis of viruses in plants and animals. Second Year : (i) continuation of the inhibition studies and its extension. (ii) studies on the variations in certain specific animal and plant viruses. To induce mutation in viruses by physical and chemical treatments, such as ultra-violet radiation, formalin, etc., for obtaining milder strains in order to protect hosts from infection with virulent strains of the same virus, such as influenza, tobacco mosaic, etc. (iii) multiplication of animal and plant viruses in insects and single cells. Insect virus relationship. Third Year : (i) continuation of inhibition, variation and mutation studies. (ii) if time permits, preliminary studies on self-duplicating infective principle causing tumourous growth in plants and animals, using tissue culture techniques, with a view to controlling such malignancies. (iii) electron microscopic studies with a view to a better understanding of the structure and function of virus. Investigations on the inhibition of viruses by heat, irradiation, chemicals, plants juices and fungal extracts have been carried out in foreign countries, but the exact mechanism of alteration of host susceptibility or diversion of normal protein synthesis into virus synthesis is not understood. Not much is known as to how the multiplication of viruses could be stopped once it is started. Knowledge of the nature of viral multiplication inside the host is necessary for a successful approach to inhibition studies.

Recommendations of the Committee of the Board	Recommendations of the Board

RESEARCH SCHEMES

Item No.	Particulars								
	<i>Author's record :</i> The author has developed a centre for virus research in his laboratory. Glass house facilities and special apparatus are available. <i>Collaboration :</i> Collaboration of Central Drug Research Institute, Lucknow, will be available. <i>Duration :</i> The scheme is for three years. <i>Grant requested for first year :</i> <table> <tr> <td>Equipment (glass house, insectory and apparatus.)</td><td>Rs. 31,000</td></tr> <tr> <td>Contingencies : (including T.A.)</td><td>Rs. 3,000</td></tr> <tr> <td>Staff : (One Virologist Rs. 600—1150. One S. S. A. Rs. 250—500. One Lab. Asstt : Rs. 75—120. One Glass House Asstt : Rs. 25—30. One sweeper Rs. 25—30).</td><td>Rs. 16,359 (including allowances)</td></tr> <tr> <td>Total</td><td>Rs. 50,359 (including allowances)</td></tr> </table> Non-recurring grant for construction of glass-house and insectory during the current year will enable these to be ready for the technical work next year. <i>Research Committee's recommendation :</i> The scheme has been referred to the Pharmaceuticals & Drugs Research Committee and the Biochemical Research Committee for opinion.	Equipment (glass house, insectory and apparatus.)	Rs. 31,000	Contingencies : (including T.A.)	Rs. 3,000	Staff : (One Virologist Rs. 600—1150. One S. S. A. Rs. 250—500. One Lab. Asstt : Rs. 75—120. One Glass House Asstt : Rs. 25—30. One sweeper Rs. 25—30).	Rs. 16,359 (including allowances)	Total	Rs. 50,359 (including allowances)
Equipment (glass house, insectory and apparatus.)	Rs. 31,000								
Contingencies : (including T.A.)	Rs. 3,000								
Staff : (One Virologist Rs. 600—1150. One S. S. A. Rs. 250—500. One Lab. Asstt : Rs. 75—120. One Glass House Asstt : Rs. 25—30. One sweeper Rs. 25—30).	Rs. 16,359 (including allowances)								
Total	Rs. 50,359 (including allowances)								
XXIV	<i>Subject :</i> Studies on the Production of an Antibiotic Substance by Streptomyces Spp. by Dr. P. N. Nandi, Head of Microbiology Section, Bose Research Institute, Calcutta. <i>Object & Scope :</i> Dr. Nandi has carried out investigation on isolation of potent strains Actinomycetes belonging to genus Streptomyces, from the soils of West Bengal, Assam, Bihar and Orissa. Of the many strains obtained one was found to possess marked anti-bacterial action against gram-positive, gram-negative and acid-fast organisms. Certain stages of purification have already been attained by employing columnar and paper chromatography and from a study by bio-autographic								

Recommendations of the Committee of the Board	Recommendations of the Board
XXIII. p.47-49. The Committee noted that the views of the Research Committees were not yet available. It was recommended that the scheme along with the opinion of the Research Committee be placed before the next meeting of the Board.	XXIII. p.47-49 The Board noted and endorsed the recommendation of its Committee.

RESEARCH SCHEMES

Item No.	Particulars								
	technique it appears that the substance is different from antibiotics already known. Unless production reaches the level of pilot plant scale and certain refined techniques of purification are adopted, it will not be possible to prove the homogeneity of the substance and study its <i>in vivo</i> activity in detail. Its possible therapeutic application also demands the production of a considerable amount of pure and homogeneous substance. Craig's method of counter-current distribution has recently emerged as an indispensable tool in this direction. In the scheme it is proposed to build up a pilot fermenter suitable for fermentation under submerged conditions (total volume 5 gallons) for semi-large scale production of the strain and to fit up Craig's apparatus in order to purify the active principle by means of counter-current distribution subsequent to the operations of charcoal adsorption, chromatography and solvent extraction. <i>Author's record :</i> Dr. Nandi has carried out detailed morphological and physiological study of the strain to identify the strain and its activity against several strains of organisms. The active principle was also obtained and its stability studied. This was reported in a paper presented at the symposium on Anti-bacterial substances from soils, plants etc., held under the auspices of C. S. I. R. in Bombay in March 1953. Toxicity studies are now underway. Vitamin B₁₂ may also be obtained as a by-product. <i>Collaboration :</i> The Chemistry Department of the Bose Research Institute and Dr. S. R. Bose (R. G. Kar Medical College) and Dr. S. Sarkar (National Medical College) will collaborate. <i>Duration :</i> The scheme is expected to be completed in two years. <i>Grant asked for :</i> <table> <tr> <td>Equipment (pilot plant fermenter, Craig's apparatus)</td><td>... Rs. 3,000</td></tr> <tr> <td>Contingencies</td><td>... Rs. 1,000</td></tr> <tr> <td>Staff (One S.S.A. One J.S.A. and One S.L.A.)</td><td>... Rs. 9,480 (including allowances)</td></tr> <tr> <td>Total</td><td><u>Rs. 13,480 (including allowances)</u></td></tr> </table> <i>Research Committee's recommendation :</i> The Pharmaceuticals and Drugs Research Committee to whom the scheme was referred for opinion have recommended sanction of the scheme in the meeting held on the 9th August 1953	Equipment (pilot plant fermenter, Craig's apparatus)	... Rs. 3,000	Contingencies	... Rs. 1,000	Staff (One S.S.A. One J.S.A. and One S.L.A.)	... Rs. 9,480 (including allowances)	Total	<u>Rs. 13,480 (including allowances)</u>
Equipment (pilot plant fermenter, Craig's apparatus)	... Rs. 3,000								
Contingencies	... Rs. 1,000								
Staff (One S.S.A. One J.S.A. and One S.L.A.)	... Rs. 9,480 (including allowances)								
Total	<u>Rs. 13,480 (including allowances)</u>								

Recommendations of the Committee of the Board	Recommendations of the Board

RESEARCH SCHEMES

Item No.	Particulars
XXV	with the financial assistance asked for except provision for Laboratory Assistant which should be provided by the Bose Research Institute. (Vide Proceedings of the P. & D. Research Committee Item No. 5(iii) page 93 of this Agenda) Subject : Protection of Timber against Attack by Marine Organisms by the President, Forest Research Institute, Dehra Dun. Object : It is proposed to conduct a systematic study of species of wood destroying marine organisms with reference to their concentration, period of attack and sensitivity to chemically treated wood. Except wood of <i>Atrocarpus gomezians</i> species, Indian timbers in general are susceptible to attacks by marine organisms. 'Green heart' timber is being imported from South America for special purposes, but this, besides involving heavy cost, is in short supply. Scope : The programme of investigation would consist of — (i) (a) identification of the various species of marine organisms during the various seasons of the year and at various depths in the sea water in harbours. (b) determination of the concentration of the above organisms during the various seasons of the year and at various depths in sea water in harbours. (ii) (a) determination of salinity, pH, chemical composition etc., of sea water at each place. (b) study of the best method of maintaining the conditions, mentioned in (a) above with a view to maintaining and breeding the marine organisms in the laboratory for durability and toxicity experiments with timber and timber preservatives. (iii) (a) determination of the natural durability of the heart woods of various species of timbers suitable for ship-building, piles and floating fenders in the harbours. (b) identification of the organisms that cause damage to each species of timbers undergoing exposure tests. (c) accelerated laboratory tests as mentioned under (iii) (a) and (b). (iv) (a) determination of toxicity of various preservative compositions both under laboratory and harbour conditions against marine organisms—individually in the laboratory tests and jointly in the harbour tests. (b) study of the leaching effect of sea water of various wood preservative chemicals in treated timber.

Recommendations of the Committee of the Board	Recommendations of the Board										
XXIV. p.49-53. The Committee recommended that the Research Scheme on the Production of an Antibiotic Substance by <i>Streptomyces</i> by Dr. P.N. Nandi be approved and the following grant be sanctioned (upto the end of the financial year 1953-54):— <table> <tr> <td>Equipment</td><td>Rs. 3,000</td></tr> <tr> <td>Contingencies</td><td>Rs. 500</td></tr> <tr> <td>Staff:</td><td>Rs. 3,292 (including allowances)</td></tr> <tr> <td>(One S. S. A. & One J. S. A.)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 6,792 (including allowances)</td></tr> </table>	Equipment	Rs. 3,000	Contingencies	Rs. 500	Staff:	Rs. 3,292 (including allowances)	(One S. S. A. & One J. S. A.)		Total	Rs. 6,792 (including allowances)	XXIV. p. 49 53. The Board endorsed the recommendation of its Committee.
Equipment	Rs. 3,000										
Contingencies	Rs. 500										
Staff:	Rs. 3,292 (including allowances)										
(One S. S. A. & One J. S. A.)											
Total	Rs. 6,792 (including allowances)										

RESEARCH SCHEMES

Item No.	Particulars												
	(c) evaluation of the durability of non-durable timber specimens like that of <i>soaul</i>, <i>chir</i> and sal sapwood after treatment with various wood preservative chemicals. (v) study of mechanism of digestion of timbers by marine organisms. (vi) (a) study of the durability of treated and untreated timber structures in sea water under actual service conditions. (b) study of the comparative resistivity against chemical action in sea water of treated timber, iron and cement concrete piles. 32 different timbers and 9 types of preservatives have been selected for study. <i>Collaboration :</i> Some work has already been done by the Forest Research Institute in collaboration with harbour authorities. Considerable more work on a bigger scale is necessary. Zoological Laboratories of Bombay (Dr. D.V. Bal of Institute of Science), Ernakulam (Prof. Narayana Menon of Maharaja's College), Trivandrum (the Marine Biologist), Madras (Dr. C.P. Ganamuthu), Vizag (Dr. P.N. Ganapati of Andhra University) and Calcutta, and the Harbour Engineers have agreed to take up the work and collaborate. The Indian Navy has also agreed to take part. Messrs. Shalimar Tar Products have endowed a scholarship in this connection. The Madras Port Trust has agreed to make a grant of Rs. 2,000. The Forest Departments of the State Governments have agreed to supply the timber required for experiments. <i>Duration :</i> The investigation is of long range nature but will be for 3 years in the first instance. <table> <tr> <td>Equipment</td><td>... Rs. 5,000</td></tr> <tr> <td>Contingencies:</td><td>... Rs. 3,000</td></tr> <tr> <td>(T A. and labour charges etc.)</td><td></td></tr> <tr> <td>Staff:</td><td>... Rs. 15,600 (including allowances)</td></tr> <tr> <td>(5 Research Assts. in the grade Rs. 200-10-350).</td><td></td></tr> <tr> <td>Total</td><td>Rs. 23,600 (including allowances)</td></tr> </table> The C.S.I.R. has been requested to make a grant of Rs. 10,000/- per year. <i>Experts' recommendation :</i> The scheme was referred to (i) Indian Naval Headquarters, (ii) Controller General of	Equipment	... Rs. 5,000	Contingencies:	... Rs. 3,000	(T A. and labour charges etc.)		Staff:	... Rs. 15,600 (including allowances)	(5 Research Assts. in the grade Rs. 200-10-350).		Total	Rs. 23,600 (including allowances)
Equipment	... Rs. 5,000												
Contingencies:	... Rs. 3,000												
(T A. and labour charges etc.)													
Staff:	... Rs. 15,600 (including allowances)												
(5 Research Assts. in the grade Rs. 200-10-350).													
Total	Rs. 23,600 (including allowances)												

Recommendations of the Committee of the Board	Recommendations of the Board

NEW PROPOSALS

Item No.	Particulars																		
	Shipping, (iii) Technical Development Establishment, Kanpur, (iv) National Chemical Laboratory, (v) Hindustan Shipyard Ltd., Vizakapatnam, (vi) Dr. N K. Pannikar, Director, Marine Biological Research Station, Mandapam, and (vii) Dr S.L. Hora, Director, Zoological Survey of India, Calcutta. All of them have supported the proposal and various suggestions in the programme of work have been made.																		
XXVI	Subject : Creation of an Analytical Wing in the Central Drug Research Institute, Lucknow, by the Director, C.D.R.I., Lucknow. <i>Note :</i> The Director, Central Drug Research Institute, Lucknow, has sent a proposal for creation of an Analytical Wing. He says, "In course of the last two years, I have been receiving numerous requests from Industrial concerns for the testing of drugs and pharmaceuticals in their different aspects and in most of the cases we had to regret our inability for want of proper staff to carry out the analytical tests. This Institute is now fully equipped for carrying out special chemical, microbiological and pharmacological tests. No other laboratory in India has these facilities. We can, therefore, take up this work without extra cost for equipment and chemicals, if only necessary staff is provided. <i>Financial implication :</i> <table> <tr> <td>Non-recurring</td><td>Nil</td></tr> <tr> <td>Recurring --</td><td></td></tr> <tr> <td>Staff :</td><td>Rs. 17,139 (including allowances).</td></tr> <tr> <td>(One J.S.O.</td><td></td></tr> <tr> <td>One S.S.A.</td><td></td></tr> <tr> <td>One J.S.A. on Rs. 200 p.m.</td><td></td></tr> <tr> <td>Two Lab. Asstt. on Rs. 100 p.m.</td><td></td></tr> <tr> <td>One Attendant on Rs. 35 p.m).</td><td></td></tr> <tr> <td>Total</td><td>Rs. 17,139 (including allowances).</td></tr> </table> "There will be some return by way of receipts as testing fees and we can fix up the fees at reasonably high levels to avoid too many enquiries. This routine testing may also reveal important new lines of research and from that point of view, it will be worth taking these up. The needs of the public and the industry in this respect will also be met to a considerable extent, if the project is carried through.	Non-recurring	Nil	Recurring --		Staff :	Rs. 17,139 (including allowances).	(One J.S.O.		One S.S.A.		One J.S.A. on Rs. 200 p.m.		Two Lab. Asstt. on Rs. 100 p.m.		One Attendant on Rs. 35 p.m).		Total	Rs. 17,139 (including allowances).
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Recommendations of the Committee of the Board	Recommendations of the Board
XXV. p. 53-57. The Committee recommended sanction of a block grant of Rs. 5,000/- (for the rest of the current financial year) towards the Research Scheme on Protection of Timber Against Attack by Marine Organisms. It was also recommended that the suggestions received from the experts be communicated to the President, Forest Research Institute for consideration and incorporation in the programme of work.	XXV. p 53-57. The Board endorsed the recommendations of its Committee.

NEW PROPOSALS

Item No.	Particulars
	"The expenditure on staff can be met from within the provision made in our budget estimates for 1953-54. If the industry eventually agrees to co-operate with the Council and finance the scheme, the staff now appointed, will be merged in that scheme." In the meeting of the Pharmaceutical Panel of Ministry of Commerce and Industry (Development Wing) held in November 1951, it was stated that the Central Drug Research Laboratory, Calcutta, being an appellate authority under the Drugs Control Act could not undertake original testing of drugs and no facilities for this purpose were available at Government Test House, Alipore. The Panel had recommended that the question of commercial testing of drugs should be taken up with the C.D.R.L., Lucknow, now, through the Council of Scientific and Industrial Research. The scheme was referred to the All India Chemical Manufacturers Association, Calcutta, to ascertain whether they would be prepared to finance and support the scheme. They have generally approved the proposal for providing testing facilities for pharmaceutical manufacturers and feel that facilities for commercial testing of drugs would be of great benefit to the industry but they are not in a position at this moment to comment on the financial implications. <i>Research Committee's recommendation :</i> The proposal was referred to the Pharmaceuticals & Drugs Research Committee for opinion. Col. R.N. Chopra, Dr. Jivraj N. Mehta, Col. Jaswant Singh and Dr. B.B. Dixit have supported the proposal. Dr. C.G. Pandit while supporting the proposal in general says, "while some work will have to be done for commercial interests, it is necessary to be sure that such work does not overwhelm the other activities of the Institute by its volume." Dr. T.R. Seshadri says that the Analytical Wing is worth developing provided it is definite that there will be sufficient work for a separate wing. Many large concerns have their own laboratories and some provincial centres have facilities for administration of Drug Laws. [There are presently six Divisions in the Central Drug Research Institute: Divisions of Botany and Pharmacognosy, Medicinal Chemistry, Biochemistry, Microbiology and Parasitology, Pharmacology and Chemotherapy, and Experimental Medicine.]
XVII	<i>Subject :</i> Creation of a Division of Biophysics in the Central Drug Research Institute, Lucknow by the Director, C. D. R. I., Lucknow. <i>Note :</i> The Director, Central Drug Research Institute, Lucknow, has sent a proposal for the creation of a separate Division of Biophysics.

Recommendations of the Committee of the Board	Recommendations of the Board
XXVI. p. 57-59. The Committee recommended that the creation of an Analytical Wing in the Central Drug Research Institute, Lucknow, be approved in principle. The Committee was, however, of the opinion that before the wing was set up a careful survey of the demand for such a wing should be made. It was recommended that the Director of the Institute be requested to make such a survey with the help of drugs and pharmaceutical manufacturers, the Ministries of Commerce & Industry and Health. It was further recommended that the D.S.I.R. be authorised to take departmental action to appoint such staff as may be necessary, commensurate with the demand for testing keeping in view that the wing should be self-supporting as far as possible.	XXVI. p. 57-59. The Board agreed with the opinion of its Committee and endorsed its recommendations.

NEW PROPOSALS

Item No.	Particulars
	He says, "Recent developments in the fields of medicine and biology have led to a steadily increasing recognition of physics as one of the many essential sub-structures of modern medicine & therapeutics. Many discoveries of fundamental physical phenomena in recent decades and the elaboration of many new physical instruments have thrown new light on biological phenomena in such a forceful manner that medical physics is now being considered as a distinct scientific discipline. Of course, physics has always supplied instruments and methods of measurement that have led to many discoveries in physiology and medicine. Fundamental knowledge of blood pressure, for example, was dependent on development of suitable manometers and many facts about the heart and circulation could not have been learned without the microscope, string galvanometer, stethoscope and Roentgen rays. However, at no time before, physical research had succeeded in revolutionizing the many older approaches to biological sciences and creating newer horizons of investigation in border line fields between medicine and physics as during comparatively recent years following the experiments on atomic fission and the discovery of many rare elements of the type of titanium, beryllium, uranium etc. For any research institution interested in studying the effects of physico-chemical agents on biological tissues which constituted one of the major aims and scope of the Central Drug Research Institute, there is urgent need today of establishing a nucleus from where studies on medicine or biophysics could be undertaken." <i>Subjects of study and research proposed to be undertaken in the Division.</i> (a) <i>Tracer Elements</i>—for diagnosis of different diseases by administering radio iodine, etc., for studying the metabolism of different drugs in animal experiments; study of radio-mimetic substances on body tissues, etc. (b) Bioelectricity and related phenomena. (c) Electrical stimulation and measurements of brain and nerve potentials as an aid to diagnosis and prognosis. (d) Radiographic analysis of cardiac volumes, gastrointestinal tract, lungs, etc. (e) Effect of ionising radiations and ultrasonics on the endocrine glands, therapy of neuralgia, etc. (f) Radiography and radio-therapy; diathermy; ionic transference of elements into tissues of the body. (g) Spectroscopy and related phenomena. (h) Chromatography and fluorescence analysis. (i) Separation of proteins and alkaloids by ultracentrifuge and electrophoresis. (j) Cell permeability, oxidation-reduction potentials. (k) Biological effect of trace elements and newer elements such as titanium, beryllium, etc.

Recommendations of the Committee of the Board	Recommendations of the Board

NEW PROPOSALS

Item No.	Particulars																																				
	Organised research in this field would also help in the solution of many problems pertaining to other Divisions of the Institute, e. g., virology, pharmacology, biochemistry, genetics, etc. <i>Financial implication :</i> <i>Capital :—</i>Some of the instruments required for the proposed Division are already in the Institute and a few others will have to be purchased. The details will be worked out after the proposal is accepted in principle. It may be possible to meet the capital expenditure out of the available balance of the capital grant. <i>Recurring :—</i>The Division is ultimately to be staffed with the following complement, as in the case of other Divisions approved in the Plan. <table><tr><th>Post</th><th>No.</th><th>Scale</th><th>Total emoluments per annum (on an average)</th></tr><tr><td>Assistant Director</td><td>1</td><td>600-1500</td><td>Rs. 14,556</td></tr><tr><td>Senior Scientific Officers</td><td>3</td><td>350-850</td><td>Rs. 26,280</td></tr><tr><td>Junior Scientific Officers</td><td>3</td><td>275-590</td><td>Rs. 19,224</td></tr><tr><td>Senior Scientific Assistants</td><td>3</td><td>250-500</td><td>Rs. 17,388</td></tr><tr><td>Junior Scientific Assistants</td><td>2</td><td>160-330</td><td>Rs. 8,040</td></tr><tr><td colspan="3">Total</td><td>Rs. 85,488 (including allowances.)</td></tr></table> The full complement of staff need not be recruited immediately. To start with the following may be provided (for the first year) <table><tr><td>One Senior Scientific Officer</td><td>Rs. 5,364</td></tr><tr><td>One Junior Scientific Officer</td><td>Rs. 4,332</td></tr><tr><td>Two Scientific Assistants—One Senior & One Junior</td><td>Rs. 7,020</td></tr><tr><td>Expenditure per annum</td><td>Rs. 16,716 (including allowances.)</td></tr></table> This may gradually be increased to the full strength as the work develops. <i>Research Committee's recommendation :</i> The proposal was referred to the Pharmaceuticals & Drugs Research Committee for opinion. Dr. B B. Dikshit, Col. Jaswant Singh and Col. R.N. Chopra have supported the proposal. Dr. C.G. Pandit while giving his support in general has suggested that at present development of activities already undertaken should be concentrated upon rather than organisation of new sections. A modest beginning may be made with facilities and personnel already available at the Institute. It would be more economical and advisable if they are distributed to other centres	Post	No.	Scale	Total emoluments per annum (on an average)	Assistant Director	1	600-1500	Rs. 14,556	Senior Scientific Officers	3	350-850	Rs. 26,280	Junior Scientific Officers	3	275-590	Rs. 19,224	Senior Scientific Assistants	3	250-500	Rs. 17,388	Junior Scientific Assistants	2	160-330	Rs. 8,040	Total			Rs. 85,488 (including allowances.)	One Senior Scientific Officer	Rs. 5,364	One Junior Scientific Officer	Rs. 4,332	Two Scientific Assistants—One Senior & One Junior	Rs. 7,020	Expenditure per annum	Rs. 16,716 (including allowances.)
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Recommendations of the Committee of the Board

Recommendations of the Board

NEW PROPOSALS

Item No.	Particulars
	of research. He has suggested investigation of the possibility of developing some of the items proposed at the Lucknow University. Dr. Seshadri thinks that most of the items suggested seem to be quite appropriate to an All India Institute of Medical Research and may not be necessary for the specific purposes of the Central Drug Research Institute. The Advisory Board of the Central Drug Research Institute at its second meeting held on the 13th February 1953 have recommended the proposal for sanction.
XXVIII	Subject : Proposal for Publishing an Indian Nautical Almanac by Prof. M.N. Saha, Calcutta. Note : Prof. M.N. Saha has sent the following proposal for the publication of an Indian Nautical Almanac. National Almanacs contain position of heavenly bodies, the sun, the moon, planets, comets, stars etc., at suitable intervals of time of the year, all astronomical constants and variables. The advance information of positions of heavenly bodies are utilised in verifying the accuracy of astronomical constants and in researches on their improvement, in astronomical studies, by navigators in determining the position of their ships in the ocean and by calendar makers. Such almanacs are at present published by U.K., U.S.A., France, Germany, Russia and Spain, but they do not provide information regarding longitudes of planets, <i>tithi</i>, and eclipse data with reference to India. The Almanac would also meet the requirements of the expanding Indian Navy and Airways and help in fostering research in astronomy. With the object of bringing about reform in the indigenous calendars still based on inaccurate data of Hindu Siddhantas, almost 1400 years old, by introducing scientific methods and modern astronomical elements, a Calendar Reform Committee has been constituted. This Committee has recommended that— “Steps should be taken to compile an Indian Ephemeris and Nautical Almanac by the Government of India showing in advance positions of the sun, the moon, planets and other important heavenly bodies”. The proposed Indian Nautical Almanac may comprise about 220 pages and may contain

Recommendations of the Committee of the Board	Recommendations of the Board
XXVII. p. 59-65. The Committee recommended in principle the creation of a separate Division of Biophysics in the Central Drug Research Institute. The Committee recommended that a small unit with one or two officers may be started to begin with and may be expanded gradually as work developed. The Committee also thought that it may be necessary to get a suitable man trained abroad in the subject.	XXVII. p. 59-65. The Board endorsed the recommendation of its Committee and further recommended that research in biophysics at the Central Drug Research Institute should be carried out in collaboration with the Medical College at Lucknow. At the instance of Dr. Kothari, the Board recommended that the Division should be known as Biophysics Instruments Division. Dr. B.C. Roy promised to send a note regarding research in biophysics.

NEW PROPOSALS

Item No.	Particulars	No. of pages
	necessary data of interest to Indian people. The contents along with the number of pages covered by each item, are given below :	
(i)	Title, Preface, Introduction etc.	8
(ii)	Calendar	4
(iii)	Mean position of planets	2
(iv)	List of festivals	4
(v)	Sun Longitude Latitude Rt. Ascension Declination Semi-diameter Equation of time Sidereal Time Radius Vector Precession, Nutation	for each day ... 16
(vi)	Moon Longitude Latitude Meridian Passages Semi-diameter Horizontal Parallax	at interval of twelve hours ... 16
	Rt. Ascension Declination	at interval of six hours ... 14
(vii)	Ending Moment of Tithis and Nakshatras	6
(viii)	Planets Mercury Venus Mars Jupiter Saturn	Geocentric longitudes, latitudes, Radius Vector, Rt. Ascension, Declination and Meridian Passages for each day ... 40
	Herschel Neptune Plato	Geocentric longitudes, latitudes, Radius Vector, Rt. Ascension Declination and Meridian Passages at interval of four days ... 6
(ix)	Heliocentric longitudes, latitudes and Radius Vector of planets	14
(x)	Mean and Apparent places of certain important stars	12
(xi)	Eclipses	12
(xii)	Sunrise and sunset Moon-rise and moonset	3
(xiii)	Phenomena and Occulations	4
(xiv)	Certain important astronomical tables and constants	10
(xv)	Explanation	12
(xvi)	Index	2
	Total No. of page	220

Recommendations of the Committee of the Board	Recommendations of the Board

Item No.	Particulars
	<i>Financial implication :</i>
	The estimated expenditure per annum is :
	Contingencies & Office Equipment Rs. 12,000 (Including T. A., printing, paper and binding charges for 4000 copies of 220 pages)
	Staff ... Rs. 34,272 (including allowances) (2 Officers on Rs. 350 p.m., 4 J.S.A.s on Rs. 160 p.m. 3 II Divn. Clerks on Rs. 100 p.m. 2 Typists on Rs. 55 p.m., 2 Peons on Rs. 30 p.m.)
	<u>Total Rs. 46,272 (including allowances)</u>
	Rs. 30,000 is estimated to be the revenue from the sale of 4000 copies at Rs. 10 per copy less commission.
XXIX	<i>Subject :—Symposia under the auspices of the C. S. I. R.</i>
	The following proposals for holding symposia during the year 1953-54 have been received
	1. CENTRAL ELECTRO-CHEMICAL RESEARCH INSTITUTE, KARAIKUDI :
	<i>On Electro-Chemical Processes—Their Application in Indian Industry—Retrospective and Prospective :</i> in November 1953 or February 1954.
	Emphasis will be laid on the exploitation by electricity of India's raw material and on the improvement of such industries as are not running very satisfactorily and economically at present.
	The symposium will be divided into five sections (i) electric furnace operations (ii) alkali and chlorine industry and electro-chemical preparation of organic and inorganic products (iii) electro plating, electro winning and refining of metals, powder metallurgy, electro polishing electro deposition of metals, protective finishes and studies of structure of electro deposits (v) electro analysis and (vi) colloidal electro chemistry.
	2. NATIONAL METALLURGICAL LABORATORY, JAMSHEDPUR :
	<i>On Recent Trends in the Field of Production of Refractories used in Metal Industries :</i> in February 1954.
	It is proposed to invite top men in the field of production and practice of refractory

<i>Recommendations of the Committee of the Board</i>	<i>Recommendations of the Board</i>
XXVIII p. 65-69. The Committee recommended that Prof. Saha's proposal be referred to the Navy, Airforce, Civil Aviation Department, Meteorological Department and the Universities where astronomy was taught, for opinion.	XXVIII. p. 65-69. The Board endorsed the recommendation of its Committee and further recommended that a Sub-Committee consisting of Prof. M.N. Saha, Dr. Kothari and the Director General of Observatories be constituted who may look into the scheme in detail and prepare a note, which may be circulated to the Navy, Airforce etc., as suggested by the Committee.

SYMPOSIA

Item No.	Particulars
	to give an account of the latest trends in the particular field and the possible application of such trends to the Indian conditions. Topics suggested are : <i>Production :</i> (i) Winning and preparation of refractory raw materials. (ii) Kilns and combustion equipment. (iii) Preparation and processing equipment. (iv) Preparation of alumino-silicate refractories. (v) Preparation of basic refractories. (vi) Preparation of silica refractories. (vii) Preparation of special refractories. <i>Practice :</i> (i) General steel-plant refractory practice. (ii) Open-hearth refractory practice. (iii) Blast furnace refractory practice. (iv) Casting pit refractory practice. (v) Cupola refractory practice. (vi) Non-ferrous refractory practice. <i>Research :</i> (i) Modern trends in research. (ii) Co-operative refractory research. (iii) Facilities for refractory research available in this country. The Board of Scientific & Industrial Research in their meeting held in March 1953 had sanctioned a symposium on Non-ferrous Metals—their Production and Possibilities in India, to be held in the National Metallurgical Laboratory. The Director, N. M. L. desired that the proposed symposium should be in the field of Refractories since one symposium on Industrial Failures of Engineering Metals and Alloys was held in the National Metallurgical Laboratory in February 1953. Accordingly sanction was given to hold a symposium on Refractories <i>instead of</i> Non-ferrous Metals Industry in India. The Director, N. M. L. says that since preliminary steps had already been taken for the symposium on Non-ferrous Metals, additional sanction may be granted for holding a symposium on Refractories. There is a general permission for holding two symposia in a Laboratory in one year. 3. CENTRAL GLASS & CERAMIC RESEARCH INSTITUTE, CALCUTTA : <i>On Indian Ceramic Raw Materials</i>—in November or December 1953. The B. S. I. R. in their meeting held in March 1953 had sanctioned holding of a symposium in the Central Glass & Ceramic Research Institute, in Quality Control in Glass Industry only, while the other symposium suggested namely on Indian Ceramic Raw Materials was not sanctioned. The Director, C. G. C. R. I. says that the Indian Ceramic Society who are holding their Silver Jubilee Session in November or December 1953 are keen on holding a symposium on the subject jointly with the C. G. C. R. I. at Banaras. A large number of people from the industry, technical men and scientists will attend the Silver Jubilee.

Recommendations of the Committee of the Board	Recommendations of the Board
XXIX. p. 69-71. The Committee recommended that the following proposals for holding symposia during the year 1953-54 be approved :— (i) On Electro-Chemical Processes and the their Application to Indian Industry by the Central Electro-Chemical Research Institute, Karaikudi. (ii) On Recent Trends in the Field of Production of Refractories used in Metal Industries by the National Metallurgical Laboratory, Jamshedpur. (iii) On Indian Ceramic Raw Materials under the Joint auspices of the Central Glass & Ceramic Research Institute and the Indian Ceramic Society.	XXIX. p. 69-71. The Board endorsed the recommendation of its Committee.

Item No.	Particulars
XXX	Subject : Proceedings of the Plastics Research Committee. (Chairman : Dr. L.O. Verman) <i>Synopsis.</i> 1. A meeting of the Plastics Research Committee was held at New Delhi on Friday, the 20th March 1953. The Committee recorded a letter from Prof. McBain to the Chairman, confirming his views that Indian scientists could develop a polystyrene or any other industry without any foreign aid or experts. 2. REPORT ON SURVEY OF RESEARCH PROBLEMS IN PLASTICS. The Committee considered the comments received from members. It was decided that problems relating to Snellac should be finally written after Dr. Bose had supplied a list of problems. Section on Proteins should be condensed. Section on Ion-exchange resins should be expanded a little. Chapters 2 and 11 were also amended in the light of comments received from the members. Other minor alterations, additions, deletions and modifications for improving the various chapters were also inserted. The Committee also decided that the Review of work done under Plastics Research Committee should be incorporated if possible after condensation, in the survey report as an appendix. The Committee finally recommended that the Survey Report as amended and corrected in the meeting along with the condensed Review as appendix should be published immediately by the C.S.I.R., without further circulation. 3. ARTICLE FOR THE JSIR. The Committee noted the Dr. S.L. Kapur had sent his part of the article for publication to the Editor, JSIR. Dr. S.R. Palit would contribute his share of the article in about a month's time. 4. NEW SCHEMES. (i) Investigation on the Electro-chemical Properties of Resin systems in Relation to Reactions Involving Exchange of Ions by Dr. B.N. Ghosh. The Committee was informed that the scheme had been approved for sanction by the B.S.I.R. and that the work would be carried out under the Chemical Research Committee. The Committee recommended that it should be kept informed of the progress of the work.

<i>Recommendations of the Committee of the Board</i>	<i>Recommendations of the Board</i>
XXX. Plastice Research Committee 1. p. 73. The Committee noted.	XXX. Plastics Research Committee. 1. p. 73. The Board noted.
2. p. 73. The Committee noted that the Report on Survey of Research Problems in Plastics was under print and would be published early in October.	2. p. 73. The Board noted.
3. p. 73. The Committee noted that a review paper by Dr. S. L. Kapur on Indian Plastics Industry had since been published in the J.S.I.R. It was recommended that Dr. Palit be requested to expedite his article.	3. p. 73. The Board noted and endorsed the recommendation of its Committee.
4. (i) p. 73. The Committee endorsed the recommendation of the Research Committee.	4 (i) p. 73. The Board noted and endorsed the recommendation of the Research Committee.

PROCEEDINGS OF THE PLASTICS RESEARCH COMMITTEE

Item No.	Particulars
	(ii) Synthetic Polyelectrolytes as Soil Conditioners by Dr. Santi R. Palit. The Committee noted that the scheme had been referred to the Indian Council of Agricultural Research for their consideration. The Committee also noted that a suggestion to hold a symposium on the above subject had not been accepted by the B.S.I.R. 5. RENEWAL OF SCHEMES. (i) Construction of Osmometers suitable for High Polymer Research by Dr. Santi R. Palit. (ii) Studies on Thermodynamic Properties of High Polymer Solutions by Dr. Santi R. Palit. (iii) Construction of Light Scattering Apparatus for the Measurement of Molecular Weight, Size and Shape of High Polymers by Dr. Santi R. Palit. The Committee noted that the above three schemes had been approved for renewal for 1953-54 by the B.S.I.R. 6. COMPLETED SCHEMES. (i) Investigation on Manufacture of Containers for Motor Vehicles' Batteries from Indian Asbestos. The Committee noted that the composition evolved at the National Chemical Laboratory, Poona, was supplied to three firms for making battery containers and to test them under actual working conditions. These companies had made certain suggestions for improvement of the moulding composition and these were now being investigated at the N.C.L. 7. SCHEMES CONSIDERED AT THE LAST MEETING. (i) Investigation on the use of Cheap Mineral Fillers for Phenolic Resins in order to prepare articles which require essentially water and abrasion resistance but are used only once, e.g., a number of articles used by the Defence Services by Shri N. R. Kamath. Shri Kamath informed the Committee that as he had no facilities, either equipment or space, it would not be possible for him to carry out work on any of the schemes he had suggested in the last meeting. The Defence Ministry had informed the Chairman that they were for the present interested in the subject in general only and that the Defence Ministry had been supplied with a list of plastic articles along with the uses to which they had been put.

Recommendations of the Committee of the Board	Recommendations of the Board
(ii) p. 75. The Committee noted. 5 (i), (ii) & (iii) p. 75. The Committee noted. 6 (i) p. 75. The Committee noted.	(ii) p. 75. The Board noted. 5 (i), (ii) & (iii) p. 75. The Board noted. 6 (i) p. 75. The Board noted.

PROCEEDINGS OF THE PLASTICS RESEARCH COMMITTEE

Item No.	Particulars
	The Committee decided that if the Defence Ministry indicated their specific interest in due course, the Committee might further consider the scheme. (ii) Exhaustive Investigations on Cotton Linters with a view to utilising the same as a raw material for (a) manufacture of cellulose derivatives, including regenerated cellulose (b) filler for ureaformaldehyde resins, by Shri N. R. Kamath. The Committee noted that the work was being carried out in the N.C.L. on the use of cotton linters and that a pilot plant was being procured and assembled. The B.S.I.R. had also recommended the use of cotton waste as a source of alpha cellulose. The Committee was informed that the Central Cotton Research Laboratory in Bombay was carrying out investigations for obtaining linters from Indian cotton-seeds and that the N.C.L. was carrying out work for obtaining alpha-cellulose or chemical pulp from the linters so obtained. A pilot plant was available at the N.C.L. but the work of installing it had not progressed because of certain technical difficulties. The Committee recommended that the Director, N.C.L. be requested to take necessary steps to put the pilot plant in operation and to initiate work on the utilisation of cotton linters. (iii) To develop plasticizers based on available raw materials for cellulose nitrate, cellulose acetate, polyvinyl chloride and vinyl chloride copolymers, by Shri N. R. Kamath. The Committee noted that the Oils and Fats Section of the N.C.L. was willing to undertake the work on this scheme provided testing facilities for the plasticizers were arranged. The Committee recommended that the work on the preparation of plasticizers for the above mentioned plastics should be undertaken by the Oils and Fats Section of the N.C.L. while the Plastics and Polymers Division of the N.C.L. should undertake the work of testing the plasticizers prepared. In order to facilitate the work, the Committee also recommended that moulds for standard pieces, which had been made in the Physical Laboratories of the C.S.I.R. a few years back, should be searched out and supplied to the N.C.L. and if the moulds could not be found new ones may be prepared by the N.C.L. (iv) Investigations on the determination of the properties of rigid plastics based on cellulose acetate, polystyrene and polyvinyl chloride, when used under Indian climatic conditions, with special reference to physiological action by Shri N.R. Kamath. The Committee decided that consideration of this scheme should be dropped. (v) Manufacture of bis-phenol-propane by Dr. K. G. Kundra. The Committee recommended that since there was a possibility of the manufacture of this material on a large scale in India, consideration of any research at this stage should be dropped.

Recommendations of the Committee of the Board	Recommendations of the Board
7 (i) p. 75-77. The Committee noted. (ii) p. 77. The Committee endorsed the recommendation of the Research Committee. (iii), (iv) & (v) p. 77. The Committee noted.	7 (i) p. 75-77. The Board noted. (ii) p. 77. The Board endorsed the recommendation of the Research Committee. (iii), (iv) & (v) p. 77. The Board noted.

PROCEEDINGS OF THE STATISTICS, STANDARDS & QUALITY CONTROL COMMITTEE

Item No.	Particulars
	(vi) Preparation of Thermoplastic Materials from Indian Turpentine Oil by Dr. L. M. Yeddnapalli. The Committee noted that Dr. Yeddnapalli was carrying out preliminary work before submitting a scheme. (vii) Manufacture of Ethylene from Ethyl Alcohol by Shri G. N Parikh. The Committee noted that some work was carried out on this subject previously as a part of a scheme under the Plastics Research Committee and was being now investigated at the Shri Ram Institute for Industrial Research, Delhi and at the N.C.L. Poona. The Committee recommended that it may be kept informed about the progress of the work. 8. MONOMERS. The Committee was informed that although information about the various monomers being available for sale had been published in both the JSIR and CSIR NEWS, the response was very limited. Even after circulating the information to various institutions individually, the response had not improved. The Committee recommended that since the monomers had been procured for the purpose of helping research workers, they should not be disposed off to any commercial interests, and that wide publicity should be given periodically regarding the availability of monomers at the N.C.L. in both the JSIR and the CSIR NEWS.
XXXI	Subject : Proceedings of the Committee on Statistics, Standards and Quality Control (Chairman : Prof. P. C. Mahalanobis, F.R.S.) Synopsis : 1. A meeting of the Committee on Statistics, Standards and Quality Control was held on the 10th July, 1953 at New Delhi. 2. NOTE ON FOLLOW UP PROGRAMME OF TRAINING & RESEARCH IN INDIA BY THE CHAIRMAN. In accordance with the recommendation of the B. S. I. R. (Proceedings of meeting held on 10-3-53 item No. 3 on p. 219-221) Prof. Mahalanobis placed before the Committee a note on Follow up Programme of Training and Research in Statistical Quality Control in India on the basis of discussion in New York with M/s. Ott, Clifford and Wescot (Members of U. N. Expert Team which visited India in 1952) and Dr. Shewhart, and in the light of the Draft Report of the U. N Experts

Recommendations of the Committee of the Board	Recommendations of the Board
(vi) p. 79. The Committee noted. (vii) p. 79. The Committee endorsed the recommendation of the Research Committee. 8. p. 79. The Committee endorsed the recommendation of the Research Committee.	(vi) p. 79. The Board noted. (vii) p. 79. The Board endorsed the recommendation of the Research Committee. 8. p. 79. The Board endorsed the recommendation of the Research Committee.
XXXI. Committee on Statistics, Standards & Quality Control. 1. p. 79. The Committee noted.	XXXI. Committee on Statistics Standards & Quality Control. 1. p. 79. The Board noted.

PROCEEDINGS OF THE STATISTICS, STANDARDS & QUALITY CONTROL COMMITTEE

Item No.	Particulars
	Team and the Report prepared by Dr. B. Panth, Liaison Officer with the U. N. team. This note comprising of the recommendations of the Chairman for the programme is summarised below :— (A) THE NOTE—<i>The need</i> : “The UN SQC project aroused a great deal of interest among the trainees and among many industrialists and Government departments. Every one is agreed about the urgent need of a follow up programme which would include (a) organizing short training courses in SQC extending over 2 or 3 weeks in different parts of the country broadly on the lines of the courses given by the UN team ; (b) giving help to the trainees who attended the U.N. courses (and other persons who will be gradually trained in future to develop SQC work in their own factories) ; (c) organising “in-service” SQC training for operations in selected individual factories ; (d) giving actual demonstrations of SQC work and solving specific problems within selected individual factories (e) organising advanced studies and research in the field. There is also the question of wider promotional activities, building up of a truly national association for SQC, conferences and discussion meetings etc. (i) <i>Establishment of a Unit</i> : It would be convenient to establish a small unit for SQC consisting of 3 or 4 whole time statisticians with SQC experience. It should function to a large extent as a mobile unit. That is, the SQC Unit should set up in selected localities temporary training headquarters for a couple of months or so, and should move from one locality to another so as to visit 3 or 4 localities during the year. As a first step the SQC units should get in touch with the trainees of the UN team in each locality and help them to apply the SQC techniques in their factories. Preferably 3 or 4 industries in each region should be taken up by the SQC Unit for this purpose. After a few successful applications are made, the SQC Unit would organise a short course of training on the same lines as the UN course. In these courses emphasis should be given to the case histories of problems actually solved and any problems brought up by the trainees. (ii) <i>Training Course</i> : For the training course, the SQC Unit should draw upon the statisticians of each locality to help in giving lectures to the trainees. The number of trainees in the each such course should be 25 or 30 at the most, selected from either Government or non-government factories in the neighbourhood with a view to promote the rapid installation of SQC in some of the factories in the locality. It may be a good plan to admit some of the persons who had attended any of the SQC training courses conducted by the UN team or who have some experience of SQC work. It would be desirable to have at least 2 or preferably 3 or 4 trainees from one single factory so that they would form a small group of enthusiastic workers and would be able to continue to work as a team in their own factory after the training is over. Preference may be given to those factories in which the

Recommendations of the Committee of the Board	Recommendations of the Board

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	Management is seriously interested and is likely to give SQC a fair trial. These industries or factories should be such in which SQC is likely to give a high dividend in the way of quick results. (iii) <i>Work in the factories</i> : After the short training course is completed some factories from which the trainees have been drawn should be selected for intensive work, preference being given to factories from which the more competent and enthusiastic trainees were drawn. The SQC Unit may work as a team in each selected factory, or may split up into 2 or 3 groups, one group taking up the promotional work in one factory according to convenience and possibilities. Each selected factory would normally have at least one (and preferably more than one) worker with SQC training. With the help of such trained workers the SQC Unit would give actual demonstrations in SQC within the selected factory, and would also try to organise "in-service" training for the factory workers by the persons who have already received their training. It should be possible for the local SQC men to start giving one or two lectures a week followed by short periods of practical work to a group of 10 or 15 factory workers who would be also encouraged and given facilities to try SQC methods in their own jobs. In this way, a group of 10 or 15 workers can probably be given "in-service" training in the course of say 3 or 4 months which should help effectively in SQC methods striking roots in the factory. In each locality the SQC Unit would discuss SQC methods with Management, try to solve specific problems and get SQC methods established on a fairly permanent basis in the selected factories. After starting the work in one locality, the SQC Unit would move to another locality and repeat the same kind of work. The SQC Unit should thus be able to visit 3 or 4 (or more) localities every year and promote SQC over the whole country. (iv) <i>Organisation of research</i> : In addition to the peripatetic training courses the SQC Unit should also spend some time at headquarters to give advanced lectures in SQC (including the application of statistics to industry generally) to statisticians and students of statistics, and participate in the organisation of research in this field. The services of the SQC Unit should be available for consultation by both Government and non-Government enterprises (either free of charge or on a fee basis to be worked out later). (v) <i>Foreign experts</i> : It would be of great advantage if one or two SQC experts can be brought from outside India to work in this country for a period of from 6 to 12 months, to act as consultants and give the SQC Unit all possible help. However, the SQC Unit should work on its own initiative to the largest possible extent.

Recommendations of the Committee of the Board	Recommendations of the Board

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	The presence of one or two foreign experts would give the SQC Unit a good deal of confidence as the foreign experts would be available for consultation whenever difficulties arise. The SQC Unit would be able to learn a good deal from the experience of the foreign experts especially during "clinical" discussions in selected factories. (vi) <i>Co-operation of factories interested</i> : It would be necessary to organise the programme of work and make all arrangements on a co-operative basis by mutual agreement among the parties interested. Once a sound technical programme is settled, there would be no difficulty in making necessary administrative arrangements on a co-operative basis." (B) DISCUSSION: There was a general discussion. Prof. Mahalanobis stated that there was a great deal to be done but there was also an acute shortage of trained personnel. The note dealt with only the follow up work based on the UN Project for training and suggested an approach only to the first phase of the problem. It merely attempted to lay down the corner stone of the foundation (i) Dr. B. Ramamurti reported that letters from the Buckingham and Carnatic Mills, Madras; Lever Brothers, Bombay; Hindusthan Aircraft and the Telephone Industry, Bangalore; the Tatas, Jamshedpur; Jay Engineering Company, Calcutta etc., were very encouraging. The Committee recommended that Dr. Ramamurti's report may be circulated to the members of the Committee. (ii) The Committee approved the suggestion of Dr K.R. Nair that the members of the Unit should be given opportunities of acquiring experience of technical advances in other countries from time to time. Dr. Gupta (Indian Standards Institution) stated that as ISI was working in close co-operation with industrialists it could help the SQC Unit in establishing contact with industrial concerns. Mrs. C Bose explained the work which the Indian Society of Quality Control was doing in Calcutta. This Society also could help in establishing contact with private industrial establishments. Dr. Bhola Panth thought it would be useful to make a review of the SQC work in the whole country. A great deal of interest had been aroused by the UN SQC project and it was necessary to establish a whole-time SQC Unit without any delay. Prof K.B. Madhava stressed the importance of getting the Unit established as early as possible. (iii) Dr. N.S.R. Sastry suggested that the proposed Unit should look into the work of the UN trainees and solve their difficulties. He stressed the importance of the SQC Unit helping local groups to overcome the psychological resistance. Dr. A.V. Sukhatme suggested that careful local enquiries should be made before selecting the factories or trainees. Attempts should also be made to secure the co-operation of all local groups interested in SQC in activities of the Unit. The other members strongly supported the idea.

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	The Committee recommended that careful preliminary enquiries should be made in advance before selecting (a) localities, (b) industries, (c) factories, and (d) trainees in drawing up the programme of SQC Unit ; and that the active help of all local or regional SQC groups should be sought in implementing the programme. The Committee unanimously agreed that a SQC Unit should be set up in India consisting of 3 or 4 whole time statisticians with SQC experience. The Committee also agreed generally with the various suggestions made by the Chairman in his note with regard to the functions of the SQC Unit with the modifications discussed at the meeting. (iv) The Chairman agreed to take necessary action for the establishment of the SQC Unit in consultation with appropriate authorities and to discuss the subject further with the D.S.I.R. as the first essential step. Once the SQC Unit was set up, a great deal of thought will have to be given to the formulation of the detailed programme of work. It would be appropriate at that stage to take stock of what was happening in different parts of the country and also to find ways and means of securing the co-operation of all the groups interested in SQC. It would be probably desirable to convene a joint meeting of the C.S.I.R. and the Indian Standards Institution Committee on SQC and invite the interested persons to attend the meeting and also to set up an Advisory Committee for the SQC Unit. These things could be taken up after the Unit was formed. Prof. Mahalanobis also informed the Committee that he was trying to get one or two SQC experts from abroad to stay in India for a year or so.
XXXII	Subject :—Proceedings of the Pharmaceuticals and Drugs Research Committee. (Acting Chairman : Col. R.N. Chopra) Synopsis : 1. A meeting of the Pharmaceuticals & Drugs Research Committee was held in Bombay on August 9, 1953. 2. PUBLICATION OF PAPERS ON BIOLOGICAL SCIENCES IN J. S. I. R. The Secretary stated that the Editor, J.S.I.R. had informed him that the section containing papers on biological subjects would be started in January 1954, when the new volume of the Journal commences. 3. SCHEMES IN PROGRESS. (i) Survey of Medicinal and Economic Plants of Ladakh—Col. R. N. Chopra The Committee noted with satisfaction the work done so far. It was further suggested

Recommendations of the Committee of the Board	Recommendations of the Board
2. p. 79-87. The Committee recommended that Prof. Mahalanobis be invited to attend the meeting of the B.S.I.R. to explain the scheme and it may be considered there in detail.	2. p. 79-87. The Board recommended that a Sub-Committee consisting of Shri Kasturbhai Lalbhai, Lala Shri Ram Dr. Kothari, Dr. Bhatnagar and Dr. J.C. Ghosh may discuss the scheme with Prof. Mahalanobis and the D.S.I.R. be authorised to take necessary action departmentally.
XXXII. Pharmaceutical & Drugs Research Committee. 1. p. 87. The Committee noted. 2. p. 87. The Committee noted.	XXXII. Pharmaceutical & Drugs Research Committee. 1. p. 87. The Board noted. 2. p. 87. The Board noted.

PROCEEDINGS OF THE PHARMACEUTICALS & DRUGS RESEARCH COMMITTEE

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	that the investigator-in-charge should indicate briefly the availability and other details of the plants that could be considered of value to the industry.
	(ii) Cortisone & Corticosterone Analogues—Dr. D. K. Banerjee.
	(iii) Chemical & Pharmacological Investigations on Some Reputed Cardiac and Uterine Drugs of Indigenous Materia Medica—Prof. B. N. Ghosh.
	The Committee noted with satisfaction the half-yearly progress of the above schemes.
	(iv) Compilation of Brochure on Indigenous Drugs of India—Dr. B. Mukerji.
	The Committee agreed that as already recommended, this brochure be called "A Handbook of Indigenous Drugs".
	The Committee was informed by Dr. B. Mukerji that Volume I would be out of the Press in about a month's time.
	The Committee learnt that the material left by Dr. Siddiqui for Volume II was incomplete in various respects. The entire work practically had to be done <i>de novo</i> . The work was now progressing satisfactorily with the assistance of the staff of the Medicinal Chemistry Division of the Central Drug Research Institute, Lucknow.
	(v) Synthesis of New Types of Insecticides—Prof. T. R. Seshadri.
	(vi) Chemical Investigation of Indian Lichens—Prof. T. R. Seshadri.
	(vii) Biological Studies on Malarial Parasites—Dr. U. P. Basu and Dr. R. N. Chaudhuri.
	(viii) Preparation of a Polyvaccine for Cholera, Typhoid and Dysentery—Dr. S. P. Gupta.
	The Committee noted with satisfaction the progress made on the above schemes.
	(ix) Antibiotic Research Centre—Col. S. S. Bhatnagar.
	(x) Microbiological Research Centre—Col. S. S. Bhatnagar.
	The Committee heard the report of the work done so far from Col. S. S. Bhatnagar. While considering it to be satisfactory, it was suggested that Col. Bhatnagar should submit a consolidated report of the work done so far, for the consideration of the annual meeting of the Committee.
	The Committee noted with satisfaction the assurance of Col. Bhatnagar that he would shortly be getting two additional rooms from the St. Xavier's College authorities for the Microbiological Research Centre.
	(xi) Chemical Investigation of Indian Cardiac Drugs—Prof. S. Rangaswami.
	In view of the fact that the work had started recently, it was decided to wait for a fuller report at the end of the year before expressing any opinion.

Recommendations of the Committee of the Board	Recommendations of the Board
3 (i) p. 87-89. The Committee endorsed the recommendation of the Research Committee.	3 (i) p. 87-89. The Board endorsed the recommendation of the Research Committee.
(ii) & (iii) p. 89. The Committee noted.	(ii) & (iii) p. 89. The Board noted.
(iv) p. 89. The Committee noted that the Indian Pharmaceutical Codex had just been published. The Committee also noted the progress of work of Volume II of the Handbook of Indigenous Drugs of India.	(iv) p. 89. The Board noted.
(v), (vi) (vii) & (viii) p. 89. The Committee noted.	(v), (vi), (vii) & (viii) p. 89. The Board noted.
(ix) & (x) p. 89. The Committee noted and endorsed the recommendation of the Research Committee.	(ix) & (x) p. 89. The Board noted and endorsed the recommendation of the Research Committee.
(xi) p. 89. The Committee noted.	(xi) p. 89. The Board noted.

PROCEEDINGS OF THE PHARMACEUTICALS & DRUGS RESEARCH COMMITTEE

Item No.	Particulars
	(xii) Biological Assaying of Insecticides—Col. Jaswant Singh. The Committee noted with satisfaction the work done so far. It was suggested that in addition to the routine testing of the insecticides, it would be useful if the screening of insecticides (synthetic and plant) with synergists or boosters which have recently been reported to be very effective, is also taken up. <i>General recommendation :</i> It was further suggested that while sending their samples for testing, all the research workers should give the chemical or any other data which led them to believe that the compounds synthesised were likely to be of insecticidal value. (xiii) Screening of Antimalarial Drugs—Col. Jaswant Singh. The Committee heard with satisfaction from Col. Jaswant Singh the report of work done. (xiv) Preparation of 8-amino quinoline Derivatives as Possible Antimalarials—Dr. U. P. Basu. The scheme was recommended for continuance upto the end of the current financial year. In case Dr. U. P. Basu considers anything arising out of the present work to be suitable for further investigation, he may kindly get in touch with Col. Jaswant Singh and put up a fresh scheme for the consideration of the Committee at their annual meeting. (xv) Survey of Fungus Flora of India—Dr. S. R. Bose. The continuance of this scheme till the end of the year 1953-54 was recommended. The position would be reviewed in the next meeting of the Committee on receipt of a further report. It was also suggested that he may contact Dr. P. Nandi at the Bose Research Institute, Calcutta for help in regard to concentration and isolation of antibiotics from the culture filtrates. Dr. S R. Bose might put up a fresh proposal for next year, if he desired. (xvi) Synthesis of Kellin, its Isomers and Related Compounds—Prof. T.R. Seshadri. (xvii) Chloramphenicol (Chloromycetin), its Derivatives and Analogues—Dr. B.D. Tilak. The Committee confirmed that the above schemes should terminate by the end of August 1953. 4. NEW SCHEMES ALREADY CONSIDERED IN THE LAST MEETING AND CIRCULATED TO OTHER COMMITTEES. (i) New Method for the Preparation of Isonicotinic acid Hydrazide—Dr. D. K. Banerji. It was decided to await the comments from the Chemical Research Committee on this scheme.

Recommendations of the Committee of the Board	Recommendations of the Board																
(xii) p. 91. The Committee endorsed the recommendation of the Research Committee. (xiii) p. 91. The Committee noted. (xiv) p. 91. The Committee recommended continuance of the Research Scheme on Preparation of 8-amino quinoline derivatives as possible antimalarials up to the end of current financial year with the following grant :- <table> <tr> <td>Equipment :</td><td>Nil</td></tr> <tr> <td>Contingencies :</td><td>Rs. 500</td></tr> <tr> <td>Staff</td><td>Rs. 5,963 (including allowances)</td></tr> <tr> <td>Total</td><td>Rs. 6,463 (including allowances.)</td></tr> </table> It was also recommended that Dr. U.P. Basu be requested to submit a fresh scheme as suggested by the Research Committee in case he wished to do further investigation arising out of the present scheme. (xv) p. 91. The Committee recommended continuance of the Research Scheme on Fungus Flora of India by Dr. S.R. Bose upto the end of current financial year with the following grant. <table> <tr> <td>Equipment.</td><td>Nil</td></tr> <tr> <td>Contingencies.</td><td>Rs. 1,000</td></tr> <tr> <td>Staff.</td><td>Rs. 9,972 (including allowances)</td></tr> <tr> <td>Total.</td><td>Rs. 10,972 (including allowances)</td></tr> </table> It was also recommended that Dr. Bose may be requested to take the help of Dr. Nandi in the concentration and isolation of antibiotics. The Committee further recommended that the Research Committee should carefully consider the results obtained in the scheme during the past 6 years and report to the next meeting of the Board whether the results were worthwhile and commensurate with the financial aid given to the investigator. (xvi) & (xvii) p. 91. The Committee recommended termination of the Research Scheme. 4. (i) p. 91. The Committee recommended that the Chemical Research Committee be requested to expedite consideration of the scheme.	Equipment :	Nil	Contingencies :	Rs. 500	Staff	Rs. 5,963 (including allowances)	Total	Rs. 6,463 (including allowances.)	Equipment.	Nil	Contingencies.	Rs. 1,000	Staff.	Rs. 9,972 (including allowances)	Total.	Rs. 10,972 (including allowances)	(xii) p. 91. The Board endorsed the recommendation of the Research Committee. (xiii) p. 91. The Board noted. (xiv) p. 91. The Board endorsed the recommendations of its Committee. (xv) p. 91. The Board endorsed the recommendations of its Committee. (xvi) & (xvii) p. 91. The Board endorsed the recommendation of its Committee. 4 (i) p. 91. The Board endorsed the recommendation of its Committee.
Equipment :	Nil																
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PROCEEDINGS OF THE PHARMACEUTICALS & DRUGS RESEARCH COMMITTEE

Item No.	Particulars										
	(ii) Biosynthesis of Citrinin Analogues—Dr. A. Sreenivasan (deferred from the last meeting). It was decided to await the comments of the Biochemical Research Committee on this scheme. 5. NEW SCHEMES : (i) Active Relaxation of Unstratied Muscle—Prof. Inderjit Singh. (ii) Latency Relaxation in Unstriated Muscle—Prof. Inderjit Singh. The schemes were discussed and it was decided that they did not fall within the purview of this Committee. Prof. Inderjit Singh may be advised to refer them to the Indian Council of Medical Research. (iii) Studies on the Production of an Antibiotic Substance by Streptomyces spp.—Dr. P. Nandi. In view of the fine work already done by Dr. P. Nandi in this line, it was recommended that this scheme may be accepted with the following grant. <table> <tr> <td>Equipment</td><td>Rs. 3,000</td></tr> <tr> <td>Contingencies</td><td>Rs. 1,000</td></tr> <tr> <td>Staff :</td><td>Rs. 7,389 (including allowances)</td></tr> <tr> <td>(One S. S. A. and One J. S. A).</td><td></td></tr> <tr> <td>Total</td><td>Rs. 11,389 (including allowances)</td></tr> </table> The post of Senior Laboratory Assistant was not recommended and it was suggested that this should be provided to the investigator by the authorities of the Bose Research Institute, Calcutta. (The scheme has already been considered under item No. XXIV p. 49-53 of this Agenda). 6. CONSIDERATION OF LETTER FROM PROF. K. N. KAUL, DIRECTOR, NATIONAL BOTANICAL GARDEN, LUCKNOW. Prof Kaul says "The schemes dealing with medicinal plants were started when there was no Botanical section in the Council Organisation. With the creation of National Botanical Garden and the Herbarium it becomes necessary that the material collected under these schemes should be preserved for future use at the Herbarium of the National Botanical Garden. It will benefit immensely if the botanical side in the schemes should take a more permanent form and duplication of activities be curtailed as far as possible in the interest of efficiency and economy".	Equipment	Rs. 3,000	Contingencies	Rs. 1,000	Staff :	Rs. 7,389 (including allowances)	(One S. S. A. and One J. S. A).		Total	Rs. 11,389 (including allowances)
Equipment	Rs. 3,000										
Contingencies	Rs. 1,000										
Staff :	Rs. 7,389 (including allowances)										
(One S. S. A. and One J. S. A).											
Total	Rs. 11,389 (including allowances)										

Recommendations of the Committee of the Board	Recommendations of the Board
(ii) p. 93. The Committee noted that the comments of the Biochemical Research Committee had since been received and communicated to the Pharmaceuticals & Drugs Research Committee. The Committee recommended that the D.S.I.R. be authorised to take necessary action departmentally on the final recommendation. 5. (i) & (ii) p. 93. The Committee recommended that the Research Schemes submitted by Prof. Inderjit Singh be referred to the Indian Council of Medical Research for consideration. (iii) p. 93. The Committee noted that the scheme had already been considered under item No. XXIV p. 49-53 of this Agenda.	(ii) p. 93. The Board noted and endorsed the recommendation of its Committee. 5. (i) & (ii) p. 93. The Board endorsed the recommendation of its Committee. (iii) p. 93. The Board noted.

PROCEEDINGS OF THE COAL BLENDING & COKING RESEARCH SUB-COMMITTEE

Item No.	Particulars
	It was recommended that sponsors of various schemes dealing with botanical subjects, should send duplicates, where available, of the material collected by them for preservation in the Herbarium of the National Botanical Garden. It was further suggested that now since an organisation like the National Botanical Garden has been started under the auspices of the C. S. I. R., various investigators working or intending to start work on botanical subjects should consult Prof. Kaul in the formulation of their plan of work. 7. SETTING UP OF A PHARMACOLOGICAL UNIT IN S. G. MEDICAL COLLEGE. The general feeling was that one such unit should be established to facilitate pharmacological research and particularly to train post-graduates for the purpose, in view of the paucity of workers in this field. It was, therefore, agreed that Col. Bhatnagar might put up a scheme in view of the facilities now available with Seth Gordhandas Medical College, where the W. H. O. has appointed Dr. Lewis as Visiting Professor for Pharmacology for three years.
XXXIII	<i>Subject: Proceedings of the Coal Blending and Coking Research Sub-Committee (Chairman: Mr. S.K. Nanavati).</i> <i>Synopsis:</i> 1. A meeting of the Coal Blending and Coking Research Sub-Committee was held on the 13th July, 1953 in Jamshedpur. 2. ACCOUNTS: Revenue and expenditure for January-March, 1953. (a) Total expenditure booked so far for 1952-53 was Rs. 68,382/-, the expenditure on staff being within limits but there is an overrun of about Rs. 3,300/- under head "Contingencies". The C. S. I. R. is being addressed for necessary action for reappropriation. (b) Renewal of grant for 1953-54: Sanction from the C. S. I. R. and TISCO had been received for Rs. 38,500 and Rs. 47,900 respectively for the year 1953-54. 3. PROGRAMME OF WORK: (i) <i>Test with Choitodih 13 and 14 seam coal, Jharia field:</i> A series of pilot oven tests were carried out blending Choitodih 13 & 14 seam coal in admixture with Tata's 'B' schedule coal mixture and Tata's 'A' schedule coal mixture to study the effect of high ash (Choitodih 13 & 14 seam) coal on the quality of the coke produced with coking coal mixture of comparatively lower ash content.

Recommendations of the Committee of the Board	Recommendations of the Board
6. p. 93-95. The Committee endorsed the recommendation of the Research Committee. It was recommended that investigators-in-charge of research schemes concerning botanical subjects may send duplicate specimens of the material collected to the Herbarium at the National Botanical Garden, Lucknow, and also that they may consult its Director regarding the assistance which the National Botanical Garden may be able to give them 7. p. 95. The Committee noted.	6. p. 93-95. The Board endorsed the recommendation of its Committee. 7. p. 95. The Board noted.
XXXIII. Coal Blending & Coking Research Sub-Committee. 1. p. 95. The Committee noted. 2. (a) p. 95. The Committee recommended that the D.S.I.R. be authorised to take necessary action departmentally for the reappropriation of the amount. (b) p. 95. The Committee noted.	XXXIII. Coal Blending & Coking Research Sub-Committee. 1. p. 95. The Board noted. 2. (a) p. 95. The Board endorsed the recommendation of its Committee. (b) p. 95. The Board noted.

PROCEEDINGS OF THE COAL BLENDING & COKING RESEARCH SUB-COMMITTEE

Item No.	Particulars
	Hard coke-according to Breslau index-was obtained from 100 per cent Choitodih seam coal individually and in blends with Tata's 'A' and 'B' schedule coal mixture. There was no deterioration in the quality of coke obtained from the blends compared to that from 100 per cent Choitodih coal. According to information supplied by the Superintendent of Collieries, TISCO, the total estimated reserves (1949) of Choitodih 13 & 14 seams were 16.8 million tons. (ii) Tests with Kustore 11 seam coal, Jharia field : The Director, Fuel Research Institute, had suggested tests with coals from seam Nos. 10 & 11, Jharia field, (high ash and low volatile matter contents) raw and washed in connection with the projected steel plant. A wagon-load of Kustore 11 seam coal (ash content 19.93%, volatile matter 22.797 & P. O. 25%) was received from General Manager, TISCO. With 100 per cent Kustore 11 seam coal when grain size of the charging coal was 80 per cent through $\frac{1}{8}$", medium hard coke according the Breslau index was obtained. Hard to very hard coke could be obtained from 100 per cent Kustore 11 seam coal with grain size 100 per cent through $\frac{1}{8}$". Hard coke (close to very hard) could be obtained by selective crushing ($+\frac{1}{8}$" fraction crushed to below $\frac{1}{16}$" mesh) of Kustore 11 seam coal. Reserves of Kustore 11 seam were extensive to warrant its use for carbonization purposes. The washability tests at the Fuel Research Institute had indicated a yield of 60 to 65 per cent with an ash content of 16 per cent. The Chairman remarked that Kustore 11 seam coal when washed would be a potential source of coking coal. Further experiments with this coal in blends with Laikdih seam with the object of producing low phosphorus coke within specified ash limits are in progress. The Committee was informed that long term investigations had been carried out at the F.R.I. applying a new method for phosphorus determination. It was decided that this method should also be adopted by the C.B.C.R. if possible and the Fuel Technologist should visit the F.R.I. to study the modified method of phosphorus determination. 4. EXPERIMENT ON IRON-COKE : Dr. Krebs has suggested experiments on iron coke viz., mixing iron ore with fine coal before coking. Investigations on these lines have been successfully carried out recently at the Mine Prosper near Essen in a silica battery built some years ago by Dr. Otto. This new method

Recommendations of the Committee of the Board	Recommendations of the Board
3. p. 95-97. The Committee noted the progress of work and endorsed the recommendation of the Research Committee on further work.	3. p. 95-97. The Board noted and endorsed the recommendation of the Research Committee.

PROCEEDINGS OF THE COAL BLENDING & COKING RESEARCH SUB-COMMITTEE

Item No.	Particulars
	might influence coking coal problems in a favourable way, enabling production of low ash and phosphorus metallurgical coke from non-coking coals. The Chairman remarked that the investigations suggested by Dr. Krebs did not fall within the purview of the Sub-Committee even though they might be of far reaching importance to iron & steel industry. The Ad-hoc Committee on Blending of Coals had desired that the work of the Sub-Committee should be definitely re-oriented for specific objects and limited entirely to the needs of the projected steel plants. If blending and washing were adopted, there might not be any shortage of coking coals for iron & steel industry as envisaged before. In view of the satisfactory results obtained with low shaft furnaces in other countries enabling use of weakly coking coals for steel manufacture, the life of the reserves of good coking coal in India could be extended if such processes are adopted, but it would be advisable to watch the developments in other countries before embarking on a new research scheme. It was unanimously agreed that the investigations on iron-coke making was beyond the scope of the Sub-Committee and the Chairman was requested to send a suitable reply to the General Manager, Tisco, on the lines indicated above. 5. INSTALLATION OF COAL WASHING PLANT AT C.B.C.R. LABORATORY : Attempts had been made to set up an interim washer plant with material loaned from Tisco but the mechanical equipment installed was unsuited for large scale work. The unit as in the F. R. I. and N. M. L. was also unsuitable for coal tests in lots of 30-40 tons. The experimental plant at F. R. I. (20 tons capacity) would also not be set up before some time. The Chairman observed that the Sub-Committee should carry out carbonisation tests on washed product of high ash coals obtaining data for the projected iron and steel plants. The Committee considered that the expenditure involved in installing a coal washer (Rs. 50,000-75,000 for 3-5 ton/hour capacity) was a costly proposition. The Sub-Committee did not have the necessary funds to bear such heavy expenditure and it would be necessary to approach the Tisco for fresh capital grant. The Secretary was advised to obtain quotations for a suitable coal washer so that the matter may receive further consideration. 6. MISCELLANEOUS : (i) <i>Investigations on coal samples from Orissa field :</i> The Sub-Committee has included this investigation in its programme of work for the year 1953-54 in view of the projected iron and steel plant in that State.

Recommendations of the Committee of the Board	Recommendations of the Board
4. p. 97-99. The Committee recommended that the action taken by the Research Committee be approved.	4. p. 97-99. The Board endorsed the recommendation of its Committee.
5. p. 99. The Committee noted.	5. p. 99. The Board noted.

SHARING OF PROFITS OF A RESEARCH SCHEME

Item No.	Particulars
	The Chairman remarked that steps should be taken to procure representative samples. Dr. Whitaker pointed out that the coals occurring in Orissa were mostly non-coking and of little use for blending tests. The Secretary was requested to write to Dr. Whitaker for particulars about these coals so that tests, if any, could be carried out with these coals from Orissa having some coking characteristics. (ii) <i>Suggestion from the Director of Geology & Mining, Madhya Pradesh, for investigation of coals from Jhillimulli fields.</i> The Chairman observed that it would be advisable to obtain a directive from the Chairman, Fuel Research Committee, before taking up such investigation. The Committee requested Dr. Whitaker to consider the matter and send a suitable reply to the Director of Geology and Mining, Madhya Pradesh.
XXXIV	Subject : Sharing of Profits of the Scheme on "Pilot Plant Experiments on the Manufacture of Nitro-benzene, Aniline and Dimethylaniline" by Dr. P.C. Guha, Indian Institute of Science, Bangalore. A research scheme on "Pilot plant experiments on the manufacture of nitrobenzene, aniline and dimethylaniline" was in operation from April, 1942 to May, 1944 under the guidance of Dr. P. C. Guha in the Indian Institute of Science, Bangalore. Permission was, however, given to Dr. Guha to retain the equipment since a number of parties had approached him for supply of the chemicals manufactured in the scheme, as these chemicals could not be imported at that time on account of war. It was suggested by him that the profits may be distributed in the proportion of 25% to the C.S.I.R. 25% to the Indian Institute of Science and 50% to the workers of the scheme. The proposal of Dr. Guha was placed before the Governing Body of the Council at the meeting held on 21st September 1945 and their decision is quoted below : "The Governing Body did not accept the above proposal in view of the fact that the scheme was wholly financed by the C.S.I.R. and also that the commercial utilization of the results of the scheme had not been considered by the Council. It was also decided that Dr. Guha be asked to dispose of the entire stock of the Chemicals at current market rates and credit the full amount of sale proceeds to the Council at an early date after

Recommendations of the Committee of the Board	Recommendations of the Board
6. p. 99-101. The Committee endorsed the recommendation of the Research Committee.	6. p. 99-101. The Board endorsed the recommendation of the Research Committee.

SHARING OF PROFITS OF A RESEARCH SCHEME

Item No.	Particulars
	which the question of paying honoraria to the workers would be considered by the Council". This was duly communicated to Dr. J.C. Ghosh, the then Director of the Indian Institute of Science, and he informed the Council that since the sale proceeds had not been fully realised and the suspense account had not yet been closed, he would write to the Council later on in this connection. The Council did not hear anything in this matter till April, 1952 when a demand draft for Rs. 2,731/13/- was received from the Registrar, Indian Institute of Science, being the Council's share of profits of the scheme. Since it was found that the profits of the scheme had been divided without reference to the decision of the Governing Body of the Council, quoted above, Prof. M.S. Thacker, Director, Indian Institute of Science, was requested to examine the circumstances under which this had been done. After a thorough investigation into the matter Prof. Thacker reported that in the absence of the previous papers regarding the sharing of profits of the scheme in the files of the Central Office of the Indian Institute of Science, the profits were divided according to the Rules of the Institute ; the Institute's share being 60% and the workers, 40%. Since the second stage of the scheme, after termination by the C.S.I.R. in 1944, was entirely financed by the Indian Institute of Science and only the C.S.I.R. equipment was used thereafter, the Institute's share of the profits was divided equally and 30% of the profits had been remitted to the C.S.I.R. He, however, admitted the omission on the part of the Institute in not obtaining the prior approval of the Council before distributing the profits of the scheme. In view of the fact that the Council of the Indian Institute of Science had approved the sharing of profits of the scheme in the proportion of 40% to the workers, 30% to the Institute and 30% to the C.S.I.R. and a portion of the profits had also been paid to the Investigators, Prof. Thacker had desired that the Governing Body of the Council may be requested to approve of the action already taken by the Indian Institute of Science.

Recommendations of the Committee of the Board	Recommendations of the Board
XXXIV p. 101-103. The Committee recommended that the D.S.I.R. and Dr. Ghosh may be requested to examine the matter further.	XXXIV p. 101-103. The Board regretted the action taken by the Director, Indian Institute of Science and it was recommended that such a case should not be repeated in future.

SUPPLEMENTARY PROCEEDINGS
of the 31st Meeting of the
BOARD OF SCIENTIFIC & INDUSTRIAL RESEARCH
held on September 22nd, 1953

<i>Item No.</i>	<i>Subject</i>	<i>Reference to Page in the Proceedings.</i>
XXXV	Pilot Plant Studies of Solvent Extraction of Oil Cakes by Alcohol and Solvent Mixtures by the Director, Central Laboratories for Scientific & Industrial Research Hyderabad (Dn.)	107
XXXVI	Pilot Plant Manufacture of Monomeric Dehydrated Castor Oil by Dr. S. A. Saletore, Officiating Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn.)	109
XXXVII	Measurement of X-ray Mass Absorption Coefficients by Dr. G.B. Deodhar, Allahabad University, Allahabad	111
XXXVIII	Proceedings of the Physical Research Committee (<i>Chairman : Dr. D S. Kothari</i>).	111
XXXIX	Proceedings of the Radio Research Committee (<i>Chairman : Dr. K.S. Krishnan</i>).	119
XL	Extension of the Calendar Reform Work for a further period of 6 months	133

SUPPLEMENTARY ITEMS

Item No.	Particulars																														
XXXV	Subject : Pilot Plant Studies of the Solvent Extraction of Oil Cakes by Alcohol and Solvent Mixtures by the Director, Central Laboratories for Scientific & Industrial Research Hyderabad (Dn.) <i>Object and Scope :</i> The object of this scheme is to investigate on a pilot plant scale solvent extraction of the residual oil left in oil seed cakes from expellers and presses. It is proposed to study the use of mixtures of alcohol and other solvents with a view to lowering the temperature of extraction and facilitate better solvent recovery. It will include the study of the efficiency of the process and arrival at optimum conditions, study of the pilot plant operation and economics of the process. Necessary data for the design of a commercial extraction unit will also be obtained. Oil seed cake at present obtained from expellers and presses contains 7-10% of residual oil. Ethyl alcohol is known to possess good extraction properties at temperatures upto 90°C and is available in the country. <i>Author's record :</i> A study of the miscibility of groundnut oil in 98% alcohol at temperatures up to 80°C has been worked out at the Central Laboratories and similar work with respect to other vegetable oils is in progress. Work on Laboratory scale is nearing completion. <i>Direction :</i> Dr. Saletore, Assistant Director and Dr. Chari, Scientific Officer will be in charge of the investigation. <i>Duration :</i> The scheme is proposed to run for two years. <i>Grant asked for :</i> <table><tr><td>Equipment</td><td>...</td><td>Rs.</td><td>35,000</td><td></td></tr><tr><td>Contingencies</td><td>...</td><td>Rs.</td><td>3,500</td><td></td></tr><tr><td>Staff:</td><td></td><td></td><td></td><td>(including allowances)</td></tr><tr><td>(One S.S.A. on Rs. 250/- p. m.</td><td></td><td></td><td></td><td></td></tr><tr><td>One Mechanic on Rs. 60/-)</td><td>...</td><td>Rs.</td><td>5,655</td><td></td></tr><tr><td>Total</td><td></td><td>Rs.</td><td>44,155</td><td>(including allowances)</td></tr></table> <i>Research Committee's Recommendation :</i> The scheme has been referred to the Vegetable Oils Research Committee.	Equipment	...	Rs.	35,000		Contingencies	...	Rs.	3,500		Staff:				(including allowances)	(One S.S.A. on Rs. 250/- p. m.					One Mechanic on Rs. 60/-)	...	Rs.	5,655		Total		Rs.	44,155	(including allowances)
Equipment	...	Rs.	35,000																												
Contingencies	...	Rs.	3,500																												
Staff:				(including allowances)																											
(One S.S.A. on Rs. 250/- p. m.																															
One Mechanic on Rs. 60/-)	...	Rs.	5,655																												
Total		Rs.	44,155	(including allowances)																											

Recommendations of the Committee of the Board	Recommendations of the Board
XXXV p. 107. The Committee noted that the opinion of the Vegetable Oils Research Committee had not yet been received. It was recommended that the scheme be placed before the Board at its next meeting along with the recommendation of the Research Committee.	XXXV p. 107. The Board noted and endorsed the recommendation of its Committee.

SUPPLEMENTARY ITEMS

Item No.	Particulars																					
XXXVI	Subject : Pilot Plant Manufacture of Monomeric Dehydrated Castor Oil by Dr. S. A. Saletore, Officiating Director, Central Laboratories for Scientific & Industrial Research, Hyderabad (Dn.) Object : It is proposed to carry out pilot plant investigation for production of monomeric dehydrated castor oil of very high quality and free from objectionable dark colour and after-tack. Dehydrated Castor Oil (D.C.O.) is being extensively used for making alkyd finishes of light colour, baking white enamels and coating for food containers. Its manufacture is an established industry in foreign countries but the process is a guarded secret. India is a major producer of good raw castor oil. The demand in foreign market for D.C.O. is rapidly rising. The cost of production is estimated at 3 to 5 annas per lb. Author's work : The production of D.C.O. of good quality has been investigated on Laboratory scale in the Central Laboratories, Hyderabad. A patent has been applied for (Ind. Patent No. 46457). Monomeric high quality D.C.O. has also been produced. Duration : The scheme is proposed for two years. Grant asked for : <table><tr><td>Equipment :</td><td>...</td><td>Rs. 60,000</td></tr><tr><td>(Pilot plant with accessories)</td><td></td><td></td></tr><tr><td>Contingencies</td><td>...</td><td>Rs. 5,000</td></tr><tr><td>Staff :</td><td></td><td>Rs. 5,655 (including allowances)</td></tr><tr><td>(One S.S.A. on Rs. 250/-p. m.</td><td></td><td></td></tr><tr><td>One J. Lab. Asstt. on Rs. 60/-p.m.)</td><td></td><td></td></tr><tr><td>Total</td><td>Rs.</td><td>70,655 (including allowances)</td></tr></table> Research Committee's recommendation : The scheme has been referred to the Vegetable Oils Research Committee.	Equipment :	...	Rs. 60,000	(Pilot plant with accessories)			Contingencies	...	Rs. 5,000	Staff :		Rs. 5,655 (including allowances)	(One S.S.A. on Rs. 250/-p. m.			One J. Lab. Asstt. on Rs. 60/-p.m.)			Total	Rs.	70,655 (including allowances)
Equipment :	...	Rs. 60,000																				
(Pilot plant with accessories)																						
Contingencies	...	Rs. 5,000																				
Staff :		Rs. 5,655 (including allowances)																				
(One S.S.A. on Rs. 250/-p. m.																						
One J. Lab. Asstt. on Rs. 60/-p.m.)																						
Total	Rs.	70,655 (including allowances)																				

Recommendations of the Committee of the Board	Recommendations of the Board
XXVI p. 109. The Committee recommended that the Research Scheme along with the opinion of the Vegetable Oils Research Committee be placed before the Board at its next meeting.	XXVI p. 109. The Board endorsed the recommendation of its Committee.

SUPPLEMENTARY ITEMS

Item No.	Particulars										
XXXVII	Subject : Measurement of X-ray Mass Absorption Co-efficients by Dr. G. B. Deodhar, Allahabad University, Allahabad. Object : The object of the scheme is to carry out measurements of the X-ray absorption co-efficient values of various substances (glasses, celluloid, polystyrene, paraffin etc.). Much work has been done abroad on theoretical as well experimental aspects of X-ray absorption co-efficients of both inorganic and organic compounds and theories of photo electric absorption have been developed but the results vary from author to author upto 10%. Author's record : Dr. Deodhar has calculated absorption values for various varieties of glasses on the basis of Klein Nishina formula for scattering and J. Victoreens formula for photoelectric absorption and has designed and built a high voltage stabilizer. An ionisation chamber is also being set up. Duration : The scheme is expected to take two years for completion. Grant asked for : <table> <tr> <td>Equipment</td><td>Nil</td></tr> <tr> <td>Contingencies</td><td>... Rs. 500</td></tr> <tr> <td>Staff</td><td>... Rs. 3,120 (including allowances)</td></tr> <tr> <td>(One J. S. A. on Rs. 200 p.m.)</td><td></td></tr> <tr> <td>Total</td><td>... Rs. 3,620 (including allowances)</td></tr> </table> Research Committee's recommendation : The scheme has been referred to the Physical Research Committee for opinion.	Equipment	Nil	Contingencies	... Rs. 500	Staff	... Rs. 3,120 (including allowances)	(One J. S. A. on Rs. 200 p.m.)		Total	... Rs. 3,620 (including allowances)
Equipment	Nil										
Contingencies	... Rs. 500										
Staff	... Rs. 3,120 (including allowances)										
(One J. S. A. on Rs. 200 p.m.)											
Total	... Rs. 3,620 (including allowances)										
XXXVIII	Subject : Proceedings of the Physical Research Committee (Chairman : Dr. D.S. Kothari). Synopsis : 1. A meeting of the Physical Research Committee was held on the 4th September, 1953 in New Delhi. 2. SCHEMES IN PROGRESS (i) Thermal Diffusion and Interdiffusion of Gases by Dr. B. N. Srivastava, Lucknow University, Lucknow.										

Recommendations of the Committee of the Board	Recommendations of the Board
XXXVII p. 111. The Committee noted that the scheme was only recently received. It was recommended that the D.S.I.R. be authorised to take departmental action on receipt of the recommendation of the Physical Research Committee. XXXVIII. Physical Research Committee. 1. p. 111 The Committee noted.	XXXVII p. 111. The Board noted and endorsed the recommendation of its Committee. XXXVIII. Physical Research Committee. 1. p. 111. The Board noted.

SUPPLEMENTARY ITEMS

Item No.	Particulars															
	(ii) X-ray Diffraction Study of Crystals by Dr. K. Banerjee, Allahabad University, Allahabad.															
	(iii) Investigation of Spectra of Molecules in the Visible and the Ultraviolet Regions by Dr. K. Majumdar, Allahabad University, Allahabad.															
	(iv) Investigations on Molecular Spectra by Dr. R. K. Asundi, Banaras Hindu University, Banaras.															
	(v) Production of Single Crystals of Alumina and Other Refractory Materials by Dr. P. K. Kichlu, Delhi University, Delhi.															
	The Committee considered the progress of the above schemes to be satisfactory.															
	(vi) Fluorescence and Absorption Spectra of Organic Molecules by Dr. V. Ramakrishna Rao, Andhra University, Waltair.															
	The request of Dr. Ramakrishna Rao for an additional grant of Rs. 3,000 under "Equipment" was considered. It was generally felt that since the Universities were tight for finances, the Committee should consider sympathetically demands for small additional finances needed for efficient running of the schemes.															
	The Committee recommended an additional grant of Rs. 1,000 under the head 'Equipment' during 1953-54.															
	(vii) Spectral Studies of the Heterocyclic Aromatic Compounds by Dr. M. R. Padhye, Bombay University, Bombay.															
	The Committee noted that Dr. Padhye, investigator-in-charge of the scheme, had gone abroad and recommended that the scheme may be suspended.															
	(viii) Development of Microwave Technique and its Application by Dr. K. Rangadhama Rao, Andhra University, Waltair.															
	The Committee noted that the scheme had not been started as Dr. Rangadhama Rao had requested sanction of the grants asked for in his original scheme.															
	The Committee after reconsideration recommended sanction of the following grant :—															
	<table><tr><td>Equipment</td><td>...</td><td>Rs. 2,000</td></tr><tr><td>Contingencies</td><td>...</td><td>Rs. 1,000</td></tr><tr><td>Staff</td><td>...</td><td>Rs. 5,184 (including allowances)</td></tr><tr><td>(One S. S. A. on Rs. 250 and One Mechanic on Rs. 60)</td><td></td><td></td></tr><tr><td>Total</td><td>Rs. ...</td><td>Rs. 8,184 (including allowances)</td></tr></table>	Equipment	...	Rs. 2,000	Contingencies	...	Rs. 1,000	Staff	...	Rs. 5,184 (including allowances)	(One S. S. A. on Rs. 250 and One Mechanic on Rs. 60)			Total	Rs. ...	Rs. 8,184 (including allowances)
Equipment	...	Rs. 2,000														
Contingencies	...	Rs. 1,000														
Staff	...	Rs. 5,184 (including allowances)														
(One S. S. A. on Rs. 250 and One Mechanic on Rs. 60)																
Total	Rs. ...	Rs. 8,184 (including allowances)														

Recommendations of the Committee of the Board	Recommendations of the Board										
2. (i), (ii), (iii), (iv) and (v) p. 111-113. The Committee noted.	2. (i) (ii), (iii), (iv), and (v) p. 111-113. The Board noted.										
(vi) p. 113. The Committee recommended sanction of an additional equipment grant of Rs. 1,000 to Dr. Ramakrishna Rao for the Research Scheme on Fluorescence and Absorption Spectra of Organic Molecules.	(vi) p. 113. The Board endorsed the recommendation of its Committee.										
(vii) p. 113. The Committee noted that the D.S.I.R. had taken departmental action to keep the scheme under suspension.	(vii) p. 113. The Board noted.										
(viii) p. 113. The Committee recommended that the following revised grant be sanctioned to Dr. Rangadhama Rao for the Research Scheme on Development of Microwave Technique and its Application (upto the end of current financial year):—	(viii) p. 113. The Board endorsed the recommendation of its Committee.										
<table> <tr> <td>Equipment</td><td>Rs. 2,000</td></tr> <tr> <td>Contingencies</td><td>Rs. 500</td></tr> <tr> <td>Staff:</td><td>Rs. 2,125 (including allowances)</td></tr> <tr> <td>(One S.S.A. on Rs. 250 p.m. and one Mechanic on Rs. 60 p.m.)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 4,625 (including allowances)</td></tr> </table>	Equipment	Rs. 2,000	Contingencies	Rs. 500	Staff:	Rs. 2,125 (including allowances)	(One S.S.A. on Rs. 250 p.m. and one Mechanic on Rs. 60 p.m.)		Total	Rs. 4,625 (including allowances)	
Equipment	Rs. 2,000										
Contingencies	Rs. 500										
Staff:	Rs. 2,125 (including allowances)										
(One S.S.A. on Rs. 250 p.m. and one Mechanic on Rs. 60 p.m.)											
Total	Rs. 4,625 (including allowances)										

SUPPLEMENTARY ITEMS

Item No.	Particulars										
	(ix) Development and Design of Electrical Measuring Instruments by Mr. N.M. Athavale, Radio Lamp Works Ltd., Poona.										
	Dr. K S. Krishnan informed the Committee that the thermocouple instruments developed under the scheme had been tested at the National Physical Laboratory and the Civil Aviation Department had asked for some instruments for field trials.										
	The Committee recommended that the work under the scheme should be completed if possible by the end of the current financial year.										
3.	NEW SCHEMES										
(i)	Soft X-ray Spectroscopy of Metals, Alloys, Semi-conductors and Fluorescent Solids by Dr. K. Dass Gupta, University College of Science, Calcutta.										
	The Committee recommended the scheme with the following grant-in-aid :										
	<table> <tr> <td>Equipment</td><td>Nil</td></tr> <tr> <td>Contingencies</td><td>Rs. 1,500</td></tr> <tr> <td>Staff</td><td>Nil</td></tr> <tr> <td>Total</td><td>Rs. 1,500</td></tr> </table>	Equipment	Nil	Contingencies	Rs. 1,500	Staff	Nil	Total	Rs. 1,500		
Equipment	Nil										
Contingencies	Rs. 1,500										
Staff	Nil										
Total	Rs. 1,500										
(ii)	Electron Diffraction Studies of Semi-conductor Rectifiers and Development of a Copper Oxide Triode, by Dr. K.R. Dixit, Institute of Science, Bombay.										
	The Committee recommended the scheme for sanction with the following grant :										
	<table> <tr> <td>Equipment</td><td>Nil</td></tr> <tr> <td>Contingencies</td><td>Rs. 750</td></tr> <tr> <td>Staff :</td><td>Rs. 4,329 (including allowances)</td></tr> <tr> <td>(One S. S. A.)</td><td></td></tr> <tr> <td></td><td>Rs. 5,079 (including allowances)</td></tr> </table>	Equipment	Nil	Contingencies	Rs. 750	Staff :	Rs. 4,329 (including allowances)	(One S. S. A.)			Rs. 5,079 (including allowances)
Equipment	Nil										
Contingencies	Rs. 750										
Staff :	Rs. 4,329 (including allowances)										
(One S. S. A.)											
	Rs. 5,079 (including allowances)										
	(The scheme has already been considered under item VI p. 7-9 of this agenda).										
(iii)	Ruling Engine for Diffraction Gratings, by Dr. P. K. Kichlu, Delhi University Delhi.										
	The Committee approved of the scheme and recommended the following grant asked for :										
	<table> <tr> <td>Contingencies</td><td>Rs. 1500</td></tr> </table>	Contingencies	Rs. 1500								
Contingencies	Rs. 1500										
	(This scheme has already been considered under item IV p. 3-5 of this agenda).										

Recommendations of the Committee of the Board	Recommendations of the Board										
(ix) p. 115. The Committee noted and endorsed the recommendation of the Research Committee.	(ix) p. 114. The Board noted and endorsed the recommendation of the Research Committee.										
3 (i) p. 115. The Committee recommended that the Research Scheme on Soft X-ray etc., by Dr. Dass Gupta be approved and the following grant be made (upto end of current financial year)											
<table> <tr> <td>Equipment</td><td>Nil</td></tr> <tr> <td>Contingencies</td><td>Rs. 1,500</td></tr> <tr> <td>Staff :</td><td>Rs. 1,475 (including allowances)</td></tr> <tr> <td>(One J.R.A.)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 2,975 (including allowances)</td></tr> </table>	Equipment	Nil	Contingencies	Rs. 1,500	Staff :	Rs. 1,475 (including allowances)	(One J.R.A.)		Total	Rs. 2,975 (including allowances)	3. (i) p. 115. The Board endorsed the recommendation of Committee.
Equipment	Nil										
Contingencies	Rs. 1,500										
Staff :	Rs. 1,475 (including allowances)										
(One J.R.A.)											
Total	Rs. 2,975 (including allowances)										
(ii) p. 115. The Committee noted that the scheme had already been considered under item VI p. 7-9 of this Agenda.	(ii) p. 115. The Board noted.										
(iii) p. 115. The Committee noted that the scheme had already been considered under item IV p. 3-5 of this Agenda.	(iii) p. 115. The Board noted.										

SUPPLEMENTARY ITEMS

Item No.	Particulars
	(iv) Some Aspects of Oceanographic Research by Dr. C. Mahadevan, Andhra University, Waltair.
	The Committee accepted the scheme but felt that the equipment required as detailed in the scheme could not be purchased in the grant asked for under "Equipment" namely Rs. 1,200. The Committee requested the Chairman to confirm from Dr. Mahadevan the exact grant required for the purchase of equipment so that appropriate grant may be sanctioned.
	(v) Use of Photo-multiplier Tubes in the Measurement of Feeble X-ray Intensity by Prof. K. Banerjee, University of Allahabad, Allahabad.
	The Committee recommended sanction of the scheme with the following grant :
	Equipment ... Rs. 1,500
	Contingencies ... Rs. 1,000
	Staff : ... Rs. 3,120 (including allowances)
	(One J. S. A.)
	Total ... Rs. 5,620 (including allowances)
	(This scheme has already been considered under item II p. 1 of this Agenda).
	(vi) Industrial Spectroscopy by Dr. P. N. Sharma, Lucknow University, Lucknow.
	The Committee felt that this was a large and long range scheme. It was recommended that the investigator may be asked to send a more specific problem for investigation to be considered by this Committee in their next meeting
	(This scheme has already been considered under item V p. 5-7 of this Agenda).
	(vii) Study of X-ray Emission and Absorption Spectra by Dr. G B. Deodhar, Allahabad University, Allahabad.
	The Committee approved of the scheme and recommended sanction with the following grant :
	Equipment ... Rs. 1,500
	Contingencies ... Rs. 1,000
	Staff ... Rs. 3,120 (including allowances)
	(One J. S. A. on Rs. 200)
	Total ... Rs. 5,620 (including allowances)
	(This scheme has already been considered under item III p. 1-3 of this Agenda).

Recommendations of the Committee of the Board	Recommendations of the Board
(iv) p. 117. The Committee noted that the Research Scheme on Some Aspects of Oceanographic Research by Dr. Mahadevan had also been recommended by the Committee on the Measurement of Geological Time in India.	
The Committee recommended approval of the Research Scheme. It was further recommended that the D.S.I.R. be authorised to fix and sanction the quantum of grant in consultation with the Chairman of the Research Committee.	(iv) p. 117. The Board noted and endorsed the recommendations of its Committee.
(v) p. 117. The Committee noted that the scheme had already been considered under item II p. 1 of this Agenda.	(v) p. 117. The Board noted.
(vi) p. 117. The Committee noted that the scheme had already been considered under item V p. 5-7 of this Agenda	(vi) p. 117. The Board noted.
(vii) p. 117. The Committee noted that the scheme had already been considered under item III p. 1-3 of this Agenda.	(vii) p. 117. The Board n

SUPPLEMENTARY ITEMS

Item No.	Particulars
	(viii) Studies in Stereochemistry by Dr. Bawa Kartar Singh, Banaras Hindu University, Banaras.
	The Committee approved of the scheme and recommended the following grant :
	Equipment ... Rs. 1,000
	Contingencies ... Rs. 1,000
	Staff (One J.S.A. on Rs. 200). ... Rs. 3,120 (including allowances)
	Total ... Rs. 5,120 (including allowances)
	4. ANY OTHER ITEM.
	<i>Renewals :</i>
	In the case of those schemes for which the progress has been satisfactory, the Committee authorised the Chairman to recommend the renewal of the schemes on the basis of the grants for current year if applied for by the investigator for the year 1954-55.
XXXIX	<i>Subject :</i> Proceedings of the Radio Research Committee. (<i>Chairman :</i> Dr. K.S. Krishnan).
	<i>Synopsis :</i>
	1. A meeting of the Radio Research Committee was held in New Delhi on the 3rd September, 1953.
	2. The Chairman explained briefly the preliminary recommendations of the Sub-Committee that was entrusted with the preparation of a planned programme of work for the Radio Research Committee. (The final recommendations will be reported at the next meeting). The recommendations were :
	(i) The programme of work outlined by the International Scientific Radio Union (U.R.S.I.) and the British Commonwealth Conference on Radio Research at their conferences, in which India participated, should be implemented as far as possible.
	(ii) The programme of work planned for the Third International Geophysical Year by the International Geophysical Year Committee, should also be implemented. A Plenary Session of the International Geophysical Year Committee was held from June 30 to July 3, 1953, in which India was represented, and an Indian National Committee has been formed to co-operate in this programme.
	(iii) The Report of the International Consultative Committee on Radio (C.C.I.R.) which is being held in London this month (September, 1953) in which also India is representing, is

Recommendations of the Committee of the Board	Recommendations of the Board
(viii) p. 119. The Committee recommended that the Research Scheme on Studies in Stereochemistry by Dr. Bawa Kartar Singh be approved and the following grant be made (upto the end of current financial year) :— Equipment ... Rs. 1,000 Contingencies ... Rs. 500 Staff ... Rs. 1,300 (including allowances) (One J.S.A. on Rs. 200/-) Total ... Rs. 2,800 (including allowances)	(viii) p. 119. The Board endorsed the recommendation of its Committee.
4. p. 119. The Committee noted.	4. p. 119. The Board noted.
XXXIX. Radio Research Committee. 1. p. 119. The Committee noted.	XXXIX. Radio Research Committee. 1. p. 119. The Board noted.

SUPPLEMENTARY ITEMS

Item No.	Particulars
	awaited. Arrangements should be made to implement those parts of the Programme that would be of interest to the Indian National Committee. (iv) The Sub-Committee reiterated the resolutions of the last meeting of the Radio Research Committee and requested that the work in connection with the standardization of time, tone and frequency at the National Physical Laboratory of India be expedited. (v) New lines of work that may be undertaken and assigned high priority are : (a) Radio Astronomy. (b) Microwave Spectroscopy and Microwave Propagation. (c) Training of Technical Personnel. The Radio Research Committee endorsed the recommendations of the Sub-Committee. When the final report of the Sub-Committee is received, a detailed programme will be drafted. 2 A. The Committee also considered the following letter from the Deputy Secretary to the Government of Uttar Pradesh to the Secretary to the Government of India, Ministry of Information and Broadcasting. "I am directed to say that the question of establishment of an Astronomical Observatory at Banaras is under active consideration of the Government of U.P. The proposed observatory will have two major sections—a Telescope Section and a Time Section. The Telescope Section will carry on observations and researches in Astrophysics while the Time Section is intended to keep correct time. Necessary apparatuses have been obtained from abroad for the purpose at a cost of about two lacs of rupees. For the Time Section a Time Standard Apparatus has been purchased from a German Firm M/s. Rohde & Schwarz, Munchen at a cost of about Rs. 58,000/-. The apparatus is a very delicate one and is designed and guaranteed to give correct time to a milli second (1/1000 of a second). The apparatus has been fixed in the premises of the Government Sanskrit College, Banaras where it is proposed to develop this Time Section of the Observatory. The installation was done by a special Engineer of the Firm who was called for the purpose from Germany. This Time Section is soon being fitted with a receiving and broadcasting set through which it is proposed to receive Time signals from other countries and broadcast correct Indian Standard Time at regular intervals for the information and benefit of all. This institution will be one of its own kind in the entire East and in future it is proposed to develop it gradually by stages. In view of the establishment of such an institution in India I am to request the Government of India, Ministry of Information and Broadcasting to consider the question of receiving Time signals for purposes of A.I.R. broadcasts from the proposed observatory at Banaras instead of British Broadcasting Corporation, whom they have hitherto been following. This on the one hand will grant recognition to an Indian Institution and at the same time go to enhance its prestige and importance. The proposed Time Section is likely to go into action from July next by which time other minor arrangements and fitting will be ready. It is, therefore, requested that the views of the Government of India in the matter may be communicated at an early date".

Recommendations of the Committee of the Board	Recommendations of the Board
2. p. 119-121. The Committee endorsed the preliminary recommendation of the Radio Research Committee on a planned programme of research in India. The Committee recommended that while finalising the planned programme the Radio Research Committee should give details such as (i) the Laboratories and investigators to whom particular items would be entrusted, (ii) priorities, (iii) equipment and other facilities needed, (iv) the period of investigation etc.	2. p. 119-121. The Board endorsed the recommendation of the Committee.

SUPPLEMENTARY ITEMS

Item No.	Particulars															
	The Committee adopted the following resolution :															
	The transmission of standard of time, tone and frequency is the function of the National Physical Laboratory of India, and this should not be delegated to other organisations, particularly on account of the high accuracy required for such transmissions. The precision should be comparable to that of broadcasts for European and American Organisations. Several independent checks and considerable preliminary work may be needed before the broadcasting of time signals may be undertaken.															
3.	NEW RESEARCH SCHEMES :															
	(i) Investigations of Lunar and Solar Tides in the Ionosphere—Mr. M.B. Banerjee.															
	The Committee felt that the ionospheric recorder constructed by the investigator under an earlier scheme sponsored by the C.S.I.R. should be utilized for the present work, and it should not be necessary to build yet another. The Committee recommended the following grant :															
	<table><tr><td>Equipment</td><td>...</td><td>Rs. 3,000</td></tr><tr><td>Contingencies</td><td>...</td><td>Rs. 1,000</td></tr><tr><td>Staff :</td><td>...</td><td>Rs. 7,140 (including allowances)</td></tr><tr><td>(2 J.S.As.)</td><td></td><td></td></tr><tr><td>Total</td><td>...</td><td>Rs. 11,140 (including allowances)</td></tr></table>	Equipment	...	Rs. 3,000	Contingencies	...	Rs. 1,000	Staff :	...	Rs. 7,140 (including allowances)	(2 J.S.As.)			Total	...	Rs. 11,140 (including allowances)
Equipment	...	Rs. 3,000														
Contingencies	...	Rs. 1,000														
Staff :	...	Rs. 7,140 (including allowances)														
(2 J.S.As.)																
Total	...	Rs. 11,140 (including allowances)														
	(ii) Electron Diffraction Studies of Semi-conductor Rectifiers and Development of a Copper Oxide Triode—Dr. K.R. Dixit.															
	A detailed study of the surface of rectifiers of the copper oxide type may yield useful results. The Committee recommended the scheme for sanction with the following grant :															
	<table><tr><td>Equipment</td><td>...</td><td>Nil.</td></tr><tr><td>Contingencies</td><td>...</td><td>Rs. 750</td></tr><tr><td>Staff :</td><td>...</td><td>Rs. 4,329 (including allowances)</td></tr><tr><td>(1 S.S.A.)</td><td></td><td></td></tr><tr><td>Total</td><td>...</td><td>Rs. 5,079 (including allowances)</td></tr></table>	Equipment	...	Nil.	Contingencies	...	Rs. 750	Staff :	...	Rs. 4,329 (including allowances)	(1 S.S.A.)			Total	...	Rs. 5,079 (including allowances)
Equipment	...	Nil.														
Contingencies	...	Rs. 750														
Staff :	...	Rs. 4,329 (including allowances)														
(1 S.S.A.)																
Total	...	Rs. 5,079 (including allowances)														
	(This scheme has already been considered under item VI p. 7-9 and item 3(ii) p. 115 of this Agenda)															

Recommendations of the Committee of the Board	Recommendations of the Board										
2 A. p. 121-123. The Committee was of the opinion that maintenance and broadcasting of standards of time, tone and frequency was the function of the National Physical Laboratory of India and therefore cannot be delegated to any other organisation. The maintenance of these standards also required continual research involving considerable expenditure and technical guidance. The Committee did not consider that this function could be discharged effectively by any other laboratory in the country. The Committee recommended that the National Physical Laboratory of India be requested to expedite the work for setting up these standards.	2 A. p. 121-123. The Board agreed with the views of its Committee and endorsed its recommendations.										
3 (i) p. 123. The Committee recommended that the Research Scheme on Investigations of Lunar and Solar Tides in the Ionosphere by Mr. B.M. Banerjee be approved and the following grant be sanctioned (upto the end of current financial year) :— <table><tr><td>Equipment</td><td>... Rs. 3,000</td></tr><tr><td>Contingencies</td><td>... Rs. 500</td></tr><tr><td>Staff</td><td>... Rs. 2,975 (including allowances)</td></tr><tr><td>(2 J.S.As)</td><td>-----</td></tr><tr><td>Total</td><td>... Rs. 6,475 (including allowances)</td></tr></table> At the instance of Prof. Saha the Committee recommended that the D.S.I.R. may examine in consultation with the Chairman any additional equipment grant that may be needed for the scheme and take necessary action departmentally.	Equipment	... Rs. 3,000	Contingencies	... Rs. 500	Staff	... Rs. 2,975 (including allowances)	(2 J.S.As)	-----	Total	... Rs. 6,475 (including allowances)	3. (i) p. 123. The Board endorsed the recommendations of its Committee.
Equipment	... Rs. 3,000										
Contingencies	... Rs. 500										
Staff	... Rs. 2,975 (including allowances)										
(2 J.S.As)	-----										
Total	... Rs. 6,475 (including allowances)										
(ii) p. 123. The Committee noted that the scheme had already been considered under item VI p. 7-9 of this Agenda.	(ii) p. 123. The Board noted.										

SUPPLEMENTARY ITEMS

Item No.	Particulars
	(iii) Study of Absorption and Dielectric Properties in the Microwave Region—Dr. P Sharma.
	The Committee recommended the scheme for sanction with the following grant :
	Equipment ... Rs. 3,000
	Contingencies ... Rs. 1,500
	Staff : ... Rs. 4,920 (including allowance)
	(1 J.S.A., 1 Mechanic)
	Total ... Rs. 9,420 (including allowance)
	The investigator may be requested preferably to study materials of indigenous origin that are likely to possess dielectric properties suitable for use in condensers.
	(This scheme has already been considered under item VII p. 9 of this Agenda).
	(iv) Use of Photo-multiplier Tubes in the Measurement of X-ray Intensity—Prof. Banerjee.
	The Committee noted that this scheme is also being considered by the Physical Research Committee. (Vide : item (v) p. 117 and item II p. 1 of this Agenda).
	The Committee recommended the following grant :
	Equipment ... Rs. 1,000
	Contingencies ... Rs. 1,000
	Staff : ... Rs. 3,120 (including allowance)
	(1 J.S.A.)
	Total ... Rs. 5,120 (including allowance)
	(v) The following two Research Schemes were presented by Prof. K. Sreenivasan at a meeting and were also considered.
	(a) Design and Construction of Ionospheric Recorder.
	(b) Investigations on Microwave Propagation.
	The Committee recommended the schemes for sanction with the following grant for of the schemes :
	Equipment ... Rs. 4,000
	Contingencies ... Rs. 1,000
	Staff : ... Rs. 3,420 (including allowance)
	(1 J.S.A.)
	Total ... Rs. 8,420 (including allowance)

Recommendations of the Committee of the Board	Recommendations of the Board
(iii) p. 125. The Committee noted that the scheme had already been considered under item VII p. 9 of this Agenda.	(iii) p. 125. The Board noted.
(iv) p. 125. The Committee noted that the scheme had already been considered under item (v) p. 117 and item II p. 1 of this Agenda.	(iv) p. 125. The Board noted.
(v) (a) & (b) p. 125. The Committee recommended that the Research Schemes on Design and Construction of Ionospheric Recorder and on the Investigation on Microwave Propagation by Prof. K. Sreenivasan be approved and the following grant be made for each of the two schemes (upto the end of current financial year) :— Equipment ... Rs. 4,000 Contingencies ... Rs. 500 Staff ... Rs. 1,425 (including allowances) (One J.S.A.) Total ... Rs. 5,925 (including allowances)	(v) (a) & (b) p. 125. The Board endorsed the recommendations of its Committee.

SUPPLEMENTARY ITEMS

Item No.	Particulars										
	4. The Committee noted that the research scheme on "R-C Coupled F.M. Oscillator" undertaken by Prof. H. Rakshit has been completed satisfactorily. In the progress report Prof. Rakshit mentioned that it would be desirable to construct an oscillator of 100 watts and proposed to submit a detailed scheme for the consideration of the Committee if the Committee thought it desirable to take up the work. The Radio Research Committee was of the opinion that the construction of 100 watt oscillator of the same type as the lower powered one constructed by him earlier would be useful, and requested Prof. Rakshit to submit a detailed scheme. 5. Regarding the scheme on study of the dielectric properties of substances of specific frequencies up to 30 000 mc/s submitted by Dr. K. Rangadhama Rao, the Radio Research Committee had recommended at its last meeting a contingency grant of Rs. 3,000/- and a Junior Research Assistant. But on the basis of the recommendations of the Physical Research Committee, to which also the scheme had been referred, Dr. Rao was sanctioned a contingency grant of only Rs. 1,000/-. The Committee considered again the requirements of the scheme and recommended the following grant : <table> <tr> <td>Equipment</td><td>Nil.</td></tr> <tr> <td>Contingencies</td><td>Rs. 3,000</td></tr> <tr> <td>Staff :</td><td>Rs. 5,100 (including allowances)</td></tr> <tr> <td>(1 S.S.A. and 1 Mechanic)</td><td></td></tr> <tr> <td>Total</td><td>Rs. 8,100 (including allowances)</td></tr> </table> The Committee suggested that Dr. Rao may be able to build up the equipment in his laboratory workshop, since a similar equipment has been built by one of the earlier investigators under a C.S.I.R. scheme with a comparable grant. (This subject has also been considered under item (viii) p. 113 of this Agenda) 6. The Committee accepted in principle the subject matter of the letter given below submitted by Mr. G.R.S. Rao of the All India Radio Manufacturers' Association : "One of the suggestions made during the last Committee meeting was the setting up of a small sub-committee to go over the scheme sponsored and worked under the Committee's auspices, particularly with a view to study and initiate original lines of work in the field of radio research. The manufacturers are particularly interested in the availability of raw materials and during the last meeting a few materials were mentioned as being worthy of prior attention. These materials are only a few and it is likely that as the industry develops there will be a shift of emphasis from one material to another. At the present state of the development of the radio industry, I consider it would be worthwhile to keep a constant watch on the development	Equipment	Nil.	Contingencies	Rs. 3,000	Staff :	Rs. 5,100 (including allowances)	(1 S.S.A. and 1 Mechanic)		Total	Rs. 8,100 (including allowances)
Equipment	Nil.										
Contingencies	Rs. 3,000										
Staff :	Rs. 5,100 (including allowances)										
(1 S.S.A. and 1 Mechanic)											
Total	Rs. 8,100 (including allowances)										

Recommendations of the Committee of the Board	Recommendations of the Board
4 p. 127. The Committee endorsed the recommendation of the Research Committee that Dr. Rakshit be requested to submit a Research Scheme on the Construction of a 100 watts F.M. Oscillator for consideration of the Radio Research Committee.	4. p. 127. The Board endorsed the recommendation of the Research Committee.
5. p. 127. The Committee endorsed the recommendation of the Research Committee and noted that the scheme had already been considered under item (viii) p. 113 of this Agenda.	5. p. 127. The Board noted and endorsed the recommendation of the Research Committee.

SUPPLEMENTARY ITEMS

Item No.	Particulars
	of indigenous resources of raw materials. To do this effectively, I suggest a body be formed who will mainly be interested in the development of raw materials for the radio industry. The Radio Research Board in U.K. has got a committee on radio materials with terms of reference to advise on research on materials (including dielectric and magnetic materials for radio applications). This committee does not consist of the members of the Radio Research Board alone but, under the Chairmanship of one of the Board members they have brought together experts on materials from research institutions and the industry. I would like to make a suggestion that a similar body be set up under the auspices of the Radio Research Committee with a panel of experts with special knowledge of manufacture and tests of raw materials. Such a body might consist of the representatives of the National Research Laboratories like the N.P.L., the N.C.L., and the Metallurgical Laboratory and might consist of suitable representatives from firms who are interested in the manufacture of materials such as enamelled and covered copper wire; aluminium, tin and copper foils; specialised paper, synthetic resin bonded paper and tubes, etc. Each member of such a Committee on raw materials should be in a position to undertake development work on one or more of the materials needed for the radio industry, subsidised to some extent from the funds of the C.S.I.R. Purely as an example of what I have in mind, a representative each from the National Insulated Cable Co. (manufacturers of enamelled and cover wires), Kamani Engineering Works (foil manufacturers) The Association of Paper Manufacturers (transformers and condensers tissue) and Bakelite (India) Ltd. (insulating board), may perhaps be suitable. There will of course be representatives from the National Research Laboratories as mentioned before. "I feel strongly that such a step will go a long way to encourage the development of indigenous resources of raw materials for the Radio and allied industries." (List of raw materials is attached as an Appendix to this Agenda) But since the number of items involved was very large, it was considered desirable to assign priorities to a few selected items. The Committee decided to refer the matter to a sub-committee consisting of the following : Mr. G.R.S. Rao. (Convenor). Mr. A.C. Ramchandani. Brig. C.H.I. Akehurst. Representative of the Bharat Electronics Industry. The sub-committee was requested to send their report at an early date. In order to expedite the matter, the Chairman was authorised to arrange for the suitable implementation of the recommendations of the sub-committee. 7. The Committee considered the following letter received from Dr. M.B. Sarwate : "I have received a copy of the letter dated the 22nd February 1953 from Shri A.N. Athavale to you on the subject of utilization of the service of radio Amateurs in this country to aid the work of the Ionospheric Data Committee. "It would be a very good idea to utilise the service of Amateurs in this country for collecting data on Ionospheric propagation. This would, however, mean ensuring that the Amateurs submitting reports have necessary equipment to measure received signal strength, are capable of assessing receiving conditions, etc., with a fair amount of accuracy and collect the information in a standard form which can readily be used and compiled. "As far as I know, most of the Amateurs in India record details of their communication with other Amateurs in the form illustrated in the A.R.R.L. publication, Radio Amateurs

Recommendations of the Committee of the Board	Recommendations of the Board
6. p. 127-129. The Committee endorsed the recommendation of the Radio Research Committee for the appointment of a Sub-Committee to consider the question of development of indigenous raw materials for the radio industry and draw up a list of priorities. It was also recommended that the Sub-Committee be requested to send their report for consideration of the Board before the next meeting.	6. p. 127-129. The Board endorsed the recommendations of its Committee.

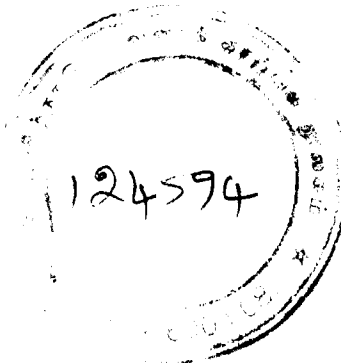
SUPPLEMENTARY ITEMS

Item No.	Particulars
	Hand-Book. This, I am afraid is a little sketchy. Moreover, the Amateurs generally log details of their contacts with other Amateurs only. If, during a particular period, no contact is established, although quite a number of stations may have been heard from different directions, no mention is made of those stations or their signal strength in the Log-Book. "I feel that in order to derive the maximum benefit from this very welcome gesture, it would be necessary to find out what equipment the Amateurs have for measuring signal strength, etc., and which of them would volunteer to submit regular reports on the subject. Once this information is available, we could discuss the matter in our next meeting and decide upon the form in which the information should be collected". <i>Letter from Mr. Athavale :</i> "I desire to point out that there are more than 150 radio amateurs in this country. As a rough estimate 50% of these are operating more or less regularly. "These amateurs establish contacts with fellow amateurs in other parts of the world at various parts of the day, on different bands of frequencies allocated to them by international regulation, either on CW or R.T. The exchange of signal reports is one of the major important points in these contacts. "It is necessary for every amateur to keep a record of these contacts. This record includes the time, frequency, signal report, reception condition such as fading, noise level etc. As such this record is very valuable information if properly collected and used, from the point of view of collection of data regarding the propagation conditions on the various frequency bands, at different times of the day and the year. "This data is also important, as it is collected by using low power equipment, which approximates the conditions of use of similar equipment by other users of similar equipment such as, Civil Aviation, Military Services etc. "I have therefore to request you to find out how to utilize the data collected by the amateurs in this country to aid the work of the above committee. It may be pointed out this data is being collected at no cost to the country, and I am positive that every amateur will be very pleased to make this data available to the C.S.I.R. If the details collected are not sufficient, more details can easily be collected. "I may point out that the National Bureau of Standards in U.S.A. is utilizing the services of amateurs to study the propagation conditions. I therefore cannot see why similar thing should not be done in this country also. "It is needless to say that I am a licenced amateur myself operating on 7, 14 M/c. regularly with about 90 watt input. I intend to start operation of 21, 28 M/c. also in due course. "I may also point out that there is also another band of amateurs who do not transmit but who only listen and pass on the reports to the transmitting station. All these are united in a club known as Amateurs Radio Club of India, with its Head Quarters in Bombay. "I am sure your organization will make use of this band of organized workers in electronics to the benefit of country. If you require any further details of our working etc. I shall be too pleased to send the same to you." The Committee appreciated the offer of co-operation from the radio amateurs. But since at present there are several Radio Amateur Clubs and Societies in India, it may be difficult to arrange co-operation with all of them. When an All India body emerges which can speak for all of them, it may be possible to ask for their co-operation on specific matters. 8. The Chairman reported the formation of the Indian National Committee for the Third International Geophysical Year for 1957-58.

Recommendations of the Committee of the Board	Recommendations of the Board
7. p. 129-131. The Committee appreciated the offer of co-operation from radio amateurs in the work of Collection and Co-ordination of Ionospheric Data in India and it was recommended that the Radio Research Committee be requested to examine how best this offer could be utilised. In this connection the Committee noted that no action had so far been taken by the Radio Research Committee on the decision of the Council taken at the meeting held on 20-11-1951 that the Radio Research Committee should collect, correlate and publish all ionospheric data collected by the various organisations in India at present. It was recommended that the Radio Research Committee be requested to start this work immediately. 8. p. 131. The Committee noted that the Indian National Committee for the Third International Geophysical Year had recommended expansion of the Committee to consist of the following :— (i) Dr. K.S. Krishnan. (ii) Prof. S.K. Mitra. (iii) Dr. K.R. Ramanathan. (iv) Director, Solar Physics Observatory, Kodai-kanal. (v) Dr. Vikram Sarabhai. (vi) Representative of the India Meteorological Department. (vii) Representative of the Central Board of Geophysics. (viii) Representative of the Survey of India. (ix) Director of the Colaba and the Alibag Observatories. The Committee recommended that reconstitution of the National Committee with the above-mentioned members be approved.	7. p. 129-131. The Board noted and endorsed the recommendation of its Committee. 8. p. 131. The Board noted and endorsed the recommendation of its Committee.

SUPPLEMENTARY ITEMS

Item No.	Particulars																
XI.	Subject : Extension of the Calendar Reform Work for a Further Period of 6 months. <i>Synopsis :</i> At the last meeting of the Governing Body of the C.S.I.R. held on 11-3-1953, the Calendar Reform Committee was entrusted with the work of preparing an experimental Calendar for 5 years in advance, that is, for the years 1954-55 to 1958-59. So far the calculation of the Calendar for one year (viz. 22nd March, 1954 to 21st March, 1955) has been completed. As regards the second year viz. 1955-56, the calculation of tithi, nakshatra, sunrise etc. is almost complete in the Calcutta Office. The calculation of Ujjain Office is also expected to be completed within a month and a half. The two sets of calculations so far made are now being compared and discrepancies where found being reconciled. Similar work of calculation, checking, fixing of festivals, making several copies of the calendar, remains to be done in respect of the next 3 years, viz. 1956-57, 1957-58 and 1958-59. Besides, the Committee will have to examine the dates of holidays declared by different State Governments and also to examine the various Calendars received from different parts of India. It would appear from the above that the work of the Calendar Reform Committee will have to be extended beyond 15th October, 1953 for a further period of 6 months. With a view to expediting the remaining work and coping with the various additional work involved, an additional post of Junior Scientific Assistant at Calcutta has been included in the budget. This augmentation has resulted in an increase of about Rs. 1000 over the previous budget grant from which it is expected that an amount of about two to three thousand rupees will remain unspent. <i>Grant asked for :</i> <table> <tr> <td>Contingencies (including T.A.)</td><td>Rs. 3,000</td></tr> <tr> <td>Staff :</td><td></td></tr> <tr> <td>(Calcutta Office : 1 Officer</td><td></td></tr> <tr> <td>2 JSAs.</td><td></td></tr> <tr> <td>1 U. D. Asstt.</td><td></td></tr> <tr> <td>1 Typist</td><td></td></tr> <tr> <td>Ujjain Office : 1 Officer & 1 JSA</td><td>Rs. 11,646 (including allowances)</td></tr> <tr> <td>Total</td><td>Rs. 14,646 (including allowances)</td></tr> </table>	Contingencies (including T.A.)	Rs. 3,000	Staff :		(Calcutta Office : 1 Officer		2 JSAs.		1 U. D. Asstt.		1 Typist		Ujjain Office : 1 Officer & 1 JSA	Rs. 11,646 (including allowances)	Total	Rs. 14,646 (including allowances)
Contingencies (including T.A.)	Rs. 3,000																
Staff :																	
(Calcutta Office : 1 Officer																	
2 JSAs.																	
1 U. D. Asstt.																	
1 Typist																	
Ujjain Office : 1 Officer & 1 JSA	Rs. 11,646 (including allowances)																
Total	Rs. 14,646 (including allowances)																

Recommendations of the Committee of the Board	Recommendations of the Board						
XL. p. 133. The Committee noted that the preparation of the Experimental Calendar for a period of five years on the lines proposed by the Calendar Reform Committee had not yet been completed. The Committee was of the opinion that the Experimental Calendar should be completed before the end of the current financial year. The following grant was recommended for this purpose :— <table> <tr> <td>Contingencies ...</td><td>Rs. 2,000</td></tr> <tr> <td>Staff ...</td><td>Rs. 8,891 (including allowances)</td></tr> <tr> <td>Total</td><td>Rs. 10,891 (including allowances)</td></tr> </table>	Contingencies ...	Rs. 2,000	Staff ...	Rs. 8,891 (including allowances)	Total	Rs. 10,891 (including allowances)	 XL. p. 133. The Board noted and endorsed the recommendation of its Committee.
Contingencies ...	Rs. 2,000						
Staff ...	Rs. 8,891 (including allowances)						
Total	Rs. 10,891 (including allowances)						