E.C. No. 163

ESTIMATES COMMITTEE
1959-60

SEVENTY-EIGHTH REPORT

(SECOND LOK SABHA)

MINISTRY OF SCIENTIFIC RESEARCH AND CULTURAL AFFAIRS

PART II

1. Secretariat (Scientific Research Wing)
2. Grants-in-aid
3. National Research Development Corporation of India
4. Technical Institutions

LOK SABHA SECRETARIAT
NEW DELHI

March, 1960
Phalguna, 1881 (Saka)

Price : Rs. 1·15

CORRIGENDA

to

SEVENTY-EIGHTH REPORT OF THE ESTIMATES COMMITTEE ON THE MINISTRY OF SCIENTIFIC RESEARCH & CULTURAL AFFAIRS - PART II.

Page 8, para 23, line 8; *for* 'revalent' *read* 'relevant'

Page 8, foot note, line 3; *for* 'planning commission' *read* 'Planning Commission'

Page 10, para 31, line 3; *for* '11/12th' *read* '1/12th'

Page 14, para 45(ii), line 1; *delete* ',' *after* 'works'

Page 21, para 66, line 7; *for* 'revealled' *read* 'revealed'

Page 21, para 68, line 11; *for* 'presisted' *read* 'persisted'

Page 22, para 72. line 9; *for* 'Article of Association' *read* 'Articles of Association'

Page 25, para 80, line 5; *for* 'candidated' *read* 'candidates'

Page 26, para 85, lines 9-11; *read the last sentence as foot-note to the para.*

Page 41, line 3; *for* '1959' *read* '1958-59' and *delete* 'to' *after* 'paid'

Page 77, Sl. No. 9, line 5; *for* 'could' *read* 'would'

Page 85, line 13; *for* 'DIREDTED' *read* 'DIRECTED'

Page 85, line 22; *delete* ',' *over* 'allowances'

Page 85, line 25, *for* 'Comparision' *read* 'Comparison'

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1959-60

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*Elected with effect from 19th December, 1959 *vice* Shri Mathuradas Mathur resigned.

INTRODUCTION

I, the Chairman, Estimates Committee having been authorised by the Committee to submit the Report on their behalf present this Seventy-eighth Report on the Ministry of Scientific Research and Cultural Affairs—Part II, on the subjects "Secretariat (S. R. Wing), Grants-in-aid, National Research Development Corporation of India and Technical Institutions".

2. The Committee wish to express their thanks to the Secretary and other Officers of the Ministry of Scientific Research and Cultural Affairs for placing before them the material and information that they wanted in connection with the examination of the estimates.

NEW DELHI;
The 16th March, 1960.
The 26th Phalguna, 1881 (*Saka*).

H. C. DASAPPA,
Chairman,
Estimates Committee.

I. SECRETARIAT (SCIENTIFIC RESEARCH WING)

A. Organisational Set-up

(a) *Introductory*

The Ministry of Scientific Research and Cultural Affairs was constituted with effect from the 10th April, 1958. Prior to this date, the Scientific Research Wing of this Ministry formed part of the Ministry of Education and Scientific Research (Department of Scientific Research and Technical Education) and consisted of the following sections:—

(*a*) Scientific Research I
(*b*) Scientific Research II
(*c*) Scientific Research III
} Under the charge of one Under Secretary.

(*d*) Vigyan Mandirs
(*e*) Survey I
(*f*) Survey II
} Under the charge of one Under Secretary.

The entire division was in the charge of a Deputy Secretary.

(b) *Present Set-up*

2. After the creation of the Ministry of Scientific Research and Cultural Affairs, this division was reorganised and it now consists of the following sections:—

(*a*) Scientific Research I
(*b*) Scientific Research II
} Under the charge of one Under Secretary.

(*c*) Scientific Research III
(*d*) Survey III
} Under the charge of one Under Secretary.

(*e*) Survey I
(*f*) Survey II
} Under the charge of one Under Secretary.

(*g*) Vigyan Mandirs — Under the charge of one Under Secretary.

3. A chart showing the present organisational set-up of the Scientific Research Wing is given as Appendix I. It is seen that the division still remains under the charge of a Deputy Secretary, and the only changes since the reorganisation are:—

(i) Creation of a new Section—Survey III; and

(ii) Increase in the number of Under Secretaries from two to four.

4. The Committee were informed that the increase in the strength of the division was due to the following factors:—

(i) Rapid expansion of the Vigyan Mandir Scheme (from 18 Vigyan Mandirs in April, 1958 to 38 at present).

(ii) Implementation of the Scientific Policy Resolution.

(iii) Transfer from the Ministry of Education of work relating to the Department of Anthropology.

(iv) General increase in the activities of the Ministry.

5. The following are the figures of receipts dealt with by each of the sections during the last three years which show the volume of work done by them:—

	1956	1957	1958
Scientific Research I Section .	6,879	7,746	9,131
Scientific Research II Section	5,650	6,611	7,045
Scientific Research III Section	4,553	5,151	5,375
Survey I Section	6,080	6,292	8,122
Survey II Section*	6,179	5,571	6,008
Survey III Section			Average of 427 receipts per month since it was set up.
Vigyan Mandirs Section .	1,954**	6,826	10,751

6. While it is a fact that the number of receipts dealt with by different sections has steadily increased during the period 1956 to 1958, *the Committee are not sure whether the creation of one additional section fully justifies the creation of two additional posts of Under Secretaries.* The Committee were informed that a special assessment of the working of the Ministry was being made by the Special Reorganisation Unit and the Scientific Research Wing would be taken up by it shortly. *The Committee suggest that the Unit should examine the feasibility of reducing the number of Under Secretaries in the Wing from four to three by suitable rationalisation and reallocation of work.*

(c) *Expenditure*

7. The following table shows the actual expenditure incurred on the pay and allowances of the gazetted and non-gazetted staff of the

*Figures pertain to the years 1956-57, 1957-58 and 1958-59.

**From 1-8-56 when the Section was set up.

Scientific Research Wing during the last three years and the budget estimates for 1959-60:

	1956-57	1957-58	1958-59	1959-60 (BE)	% (Col. 4 to Col. 1).
	(1)	(2)	(3)	(4)	
	Rs.	Rs.	Rs.	Rs.	
Pay and allowances of Officers	99,630·00	1,09,668·00	1,39,933·00	2,45,700·00	246
Pay and allowances of Staff .	1,31,911·38	1,34,021·63	1,59,696·95	2,07,100·00	157
T.A. to Officers and Staff .	6,507·50	10,231·61	15,909·47	19,000·00	291
	2,38,048·88	2,53,921·24	3,15,539·42	4,71,800·00	198

8. It is thus seen that the expenditure on establishment has gone up progressively during the last three years. The expenditure on travelling allowances to officers and staff in particular has increased at a fast pace, the budgeted figures for 1959-60 being about three times the actual expenditure in 1956-57. While the budget estimates for 1959-60 under "Pay and allowances of staff" are 157 per cent. of the actual expenditure during 1956-57, the corresponding figure under "Pay and allowances of Officers" is 246 per cent. which appears to be disproportionately high. *The Committee consider that there is obviously scope for economy in regard to "Pay and allowances of Officers" and "T.A. to officers and staff" and recommend that the matter may be examined with a view to bring down the expenditure under these two heads to a reasonable level.*

B. Indian Scientific Liaison Office, London

(a) *Functions*

9. The Indian Scientific Liaison Office, London was set up in September, 1948 as a result of the experience of the work done by the Commonwealth Scientific Liaison Offices in London and Washington during the war. Its functions are:—

(i) to facilitate the movement of scientists within the Commonwealth and to provide adequate facilities for them and their work and to arrange contacts for them;

(ii) to keep abreast of the latest improvements in techniques and scientific and technical developments, and make this information available in India;

(iii) to facilitate exchange of scientific information and experimental material, such as, plants, animals, micro-organisms; and

(iv) to help, wherever required, in the placing of research workers in British and American laboratories for research or training.

10. The Committee were informed that the Scientific Liaison Officer was represented on the following main Committees and that he had to attend various meetings of these and other committees:—

(a) British Commonwealth Scientific Organisation (Standing Committee)

(b) British Commonwealth Scientific Organisation (Working Party).

(c) Central Secretariat of the Commonwealth Advisory Aeronautical Research Committee.

(d) Department of Scientific Research—Food Investigation Board.

(e) Standing Committee on British Commonwealth Forestry.

(f) Department of Scientific and Industrial Research—Pest Infestation Board.

11. The Committee were further informed that the Scientific Liaison Officer attended meetings and conferences as and when required to do so by the various Government Departments and research establishments in India, or when invited by scientific and research organisations in the United Kingdom. He was also required to attend "Open Days" of the research institutes, exhibitions and visit research laboratories along with Scientific Liaison Officers of the other Commonwealth countries and to pass on useful information thus obtained to appropriate authorities in India. In addition, he often arranged interviews and appointments of Indian Scientists visiting the United Kingdom. He also helped in the selection of scientific and technical personnel in the United Kingdom for India.

12. It was also stated that the work of the Scientific Liaison Office consisted not only in forwarding information of scientific value from the Commonwealth countries to India but also in bringing to the attention of the Commonwealth countries scientific work done in India thus serving as a clearing house for scientific information.

(b) *Expenditure*

13. Following are the figures of expenditure on the office during the last three years:

		Rs.
1956-57	..	63,623
1957-58	..	66,023
1958-59	..	67,000

For the year 1959-60, a provision of Rs. 86,000 has been made and the increase is for reviving the post of Scientific Liaison Officer which has been lying vacant since the retirement of Dr. S. Krishna in August, 1958.

(c) *Posts sanctioned*

14. The following are the posts sanctioned for this office up to the 29th February, 1960 for the present. It has been stated that action is being taken to extend these posts for a further period of five years:—

(i) One Scientific Adviser to the High Commission and Scientific Liaison Officer.

(ii) One Senior Scientific Officer.

(iii) One Clerical Officer (Secretary).

(iv) One Steno-typist.

15. The Committee understand that since the retirement of Dr. S. Krishna, the Scientific Adviser to the High Commission and Scientific Liaison Officer, the work is being attended to by Shri B. Sen, Deputy Secretary (an officer of the Ministry of S.R. & C.A. on deputation to the Ministry of Education) in addition to his own duties of looking after the Indian students receiving technical education in the United Kingdom. The Committee were informed that the post had not been filled partly as a measure of economy but chiefly because of the difficulty in obtaining a suitable person.

16. In regard to the post of the Senior Scientific Officer, the Committee understand that it has not been filled up since it was created in 1950 because the UPSC had been unable to find a suitable person. During his evidence, the representative of the Ministry agreed that this officer was not needed at present but when the tempo of scientific development increased, it would be necessary to fill up the post.

17. *In view of the foregoing, the Committee recommend that (i) the Scientific Liaison Officer should be appointed quickly so that the Unit may function efficiently, and (ii) the post of the Senior Scientific Officer may be kept in abeyance.*

18. The Committee were informed in this connection that it was proposed to extend the area of activities of the Scientific Liaison Office to other advanced countries such as USSR, USA and Germany. *The Committee are of the view that the Ministry should, in the first instance, see to it that the office functions effectively within its existing jurisdiction and then only should the question of extending its jurisdiction to cover other advanced countries in Europe be examined.*

II. GRANTS-IN-AID

A. Number of aided Institutions and procedure for giving grants.

19. The Ministry of Scientific Research and Cultural Affairs has been giving grants-in-aid to the scientific societies and institutes which are about 35 in number. Among these societies and institutes, the following are the major scientific institutes:—

(1) Indian Association for the Cultivation of Science, Calcutta.

(2) Bose Institute, Calcutta.

(3) Indian Science Congress Association, Calcutta.

(4) Birbal Sahni Institute of Palaeóbotany, Lucknow.

(5) National Institute of Sciences of India, New Delhi.

Grants to the minor scientific societies are paid for the publication of their journals on the recommendation of the National Institute of Sciences of India. Grants to the major institutes are paid for their recurring and non-recurring expenditure.

20. A statement showing the names of all the scientific societies and institutes which have been given grants by the Ministry during the last three years, specifying the amount paid and the purpose and conditions of the grants is attached as Appendix II. The procedure followed for sanctioning grants for conducting scientific research is given as Appendix III.

B. Expenditure incurred.

21. During the First Five Year Plan a sum of Rs. 17·30 lakhs was originally provided for the development of the various scientific societies. Of this, Rs. 8.90 lakhs was utilised upto the end of 1953-54. As the expenditure for the remaining two years of the Plan period was estimated at Rs. 26.10 lakhs, the Planning Commission agreed to increase the provision from Rs. 17.30 lakhs to Rs. 35 lakhs. As against this, the total expenditure in the plan period came to Rs. 20·03 lakhs only, leaving a heavy shortfall of Rs. 15 lakhs. *The Committee consider in the circumstances that the increase subsequently made over the original provision was unrealistic and unduly high.*

22. In the Second Plan, a provision of Rs. 200.00 lakhs has been made for financing the development programme of the scientific societies and institutes. Against this, a sum of Rs. 84·27 lakhs (approximately) has been spent during the first three years of the Second Plan.

23. The Committee were informed that till the year 1957-58, the Ministry of Finance used to scrutinise the schemes relating to the development programme of the scientific societies and institutes twice (i) at the time of making budget provision and (ii) at the time of making actual payment. Because of this double scrutiny the actual amount sanctioned after the second scrutiny was much less than the amount agreed to by the Ministry of Finance after the first scrutiny. The revalent figures are given below:—

(Rs. in lakhs)

Year	Amount agreed to by the Ministry of Finance at the time of first scrutiny	Amount agreed to by the Ministry of Finance at the time of second scrutiny
1956-57 . . .	57·35*	28·54
1957-58 . . .	32·08	23·47

24. The Committee were informed that with the establishment of the scheme of Internal Finance with effect from 1958-59, it was no longer necessary for a second scrutiny to be undertaken by the Ministry of Finance. This had resulted in almost the entire budget provision for the years 1958-59 and 1959-60 being fully utilised. During the current financial year, the expenditure was likely to exceed the sanctioned budget provision. The relevant figures of budget provision and expenditure incurred during these two years are given below:

(Rs. in lakhs)

Year	Budget Provision	Expenditure incurred
1958-59 . . .	32·50	32·25
1959-60 . . .	35·46	42·35 (likely to be incurred upto 31-3-1960.)

The Committee are glad that under the revised procedure, the Ministry has been able to utilise fully the entire budget provision and avoid shortfalls which were a recurring feature in previous years.

25. The Committee were informed that during the next financial year 1960-61, a budget provision of Rs. 50.66 lakhs had been agreed to by the Ministry of Finance. Taking the actual expenditure incurred

*Includes a provision of Rs. 10 lakhs for the scheme 'development of wings at research institutes for fundamental research on biological sciences' which was dropped by the planning commission at a later stage.

during the first three years of the Second Five Year Plan, the expenditure likely to be incurred during the fourth year, *i.e.* 1959-60 and the budget provision for 1960-61, the last year of the Plan, it is estimated that the total expenditure would come to about Rs. 177.00 lakhs as against the sum of Rs. 200.00 lakhs allocated by the Planning Commission for this purpose during the entire Plan period. Thus a saving of about Rs. 23 lakhs is anticipated. *The Committee suggest that the amount may be surrendered well in time so that, if necessary, it may be allocated to other plan items in need of additional grants.*

26. The National Institute of Sciences of India, in their memorandum submitted to the Committee stated that compared to expenditure incurred within Government and quasi-Government agencies, the grants by the authorities to universities and scientific institutions and societies were small. *The Committee consider that the latter institutions have an important role to play in the field of science incluaing scientific research. They accordingly suggest that the Ministry's endeavour should be to build up a vigorous system of research both within and outside Government. With this end in view, the question of affording adequate assistance in suitable cases to existing scientific institutions for enlarging their activities or for taking up new lines of activity and to new institutions with well defined objectives should be sympathetically examined.*

27. The question as to what control or supervision Government should exercise in the case of educational institutions in receipt of grants-in-aid has been dealt with by the Committee in their 24th Report (Second Lok Sabha). *While reiterating the observations, the Committee feel that in the case of the grants-in-aid to scientific institutions, they should be enabled to function in their own way so long as the grants-in-aid are employed for the purposes they are given. It is only when they do not conform to the conditions of the grants that Government may intervene.*

28. The Study Group of the Committee which visited the National Institute of Sciences were informed that their proposal to provide living accommodation for visiting scientists as a part of their second plan schemes had been approved by the Government. A few working rooms with attached bath and lavatories were to be provided so that the research scientists during their stay in Delhi in connection with conferences etc., could utilise their spare time for research work in undisturbed surroundings. As a result of objection later by the Ministry, the proposal to provide bath room and lavatories was abandoned. When the construction of the building, as modified, had already come up to the lintel level, a further objection was raised by the Ministry that as there was already a reading room, there was no need to provide separate working rooms.

29. *The Committee would like to observe that before sanctionting a scheme of an aided institute, all the details should be gone into and*

there should be no unilateral modification during the course of its implementation. They are of the opinion that it would be desirable to permit some latitude to the major scientific institutes in the matter of implementation of the plan schemes for which finances have already been allocated.

30. *Where a reviewing committee has found the work of an institute satisfactory, the Committee are of the view that there would be advantage in assuring it a fixed annual grant over a period, say of five years which would enable it to plan its programme for that period.*

31. The Committee were given to understand that the question of giving 'on account' payments to scientific societies and institutes ranging from 11/12th to 1/6th of the total grant for the year, or a fixed sum, according to the merits of the case, was under the active examination of the Government. *The Committee recommend that this proposal should be implemented early to overcome the financial difficulties experienced by some of these institutes due to delays in payment of grants.*

C. Reviewing Committees

32. The Committee were informed that as regards private scientific research institutions, there was no regular machinery to evaluate the results achieved and to assess whether such of the purposes for which the grants-in-aid were given to them were fulfilled adequately though once in a while a review was made in certain cases. In the case of the Bose Institute, Calcutta, Dunnicliff Committee in 1941 and Vallarta Committee in 1948 were appointed and in the case of the Indian Association for the Cultivation of the Science, Calcutta, a Reviewing Committee under the Chairmanship of Shri Harry Melville was appointed during 1958. A committee to review the work of the Birbal Sahni Institute of Palaeobotany, Lucknow had also been appointed recently.

33. The Committee were informed that in order to ensure that the standard of work of these organisations was maintained and that their achievements were commensurate with the grants given to them and that the policies followed by them were in accordance with the objects for which grants were sanctioned, such of them as were in receipt of recurring grants of Rs. 1 lakh and above, had on their governing bodies|councils representatives of the Government of India. Recurring grants of Rs. 1 lakh or above were also subject to the condition that the accounts of the grantee would be open to test check by the Comptroller and Auditor General at his discretion.

34. It is seen that the Government of India appoint reviewing committees periodically for their own institutes and others in receipt of heavy grants to evaluate the results of their work. *The Committee consider that in the case of major scientific institutes getting substantial grants-in-aid from the Government of India it would be desirable to have a committee at regular intervals of 5 years to review their work.*

The Committee feel that the institutes would welcome such a review periodically.

D. Birbal Sahni Institute of Palaeobotany

(a) *Introductory*

35. The development of palaeobotanical research in India is largely due to the efforts of the late Prof. Birbal Sahni who made a small beginning with his private resources. Later in 1946 the Palaeobotanical Society was established and a trust bearing the name was created with a nucleus of private funds and immovable property, a reference library and fossil collections of Prof. Sahni and Mrs. Sahni. The Trust thus formed set up the Institute of Palaeobotany with Prof. Sahni as honorary Director. Since 1947, the Institute has been receiving substantial recurring and non-recurring grants from the Government of India.

(b) *Expenditure*

36. The following are the figures of expenditure incurred by the Institute as against the grants-in-aid given by the Government of India during the years 1956-57 to 1959-60:—

Year	Recurring		Non-recurring	
	Grants-in aid from Govt. of India	Expenditure	Final Demand	Actual Grants
	Rs.	Rs.	Rs.	Rs.
1956-57	1,70,000	1,92,383	2,42,684	79,195
1957-58	1,89,000	2,11,411	88,385	45,000
1958-59	2,13,000	2,28,390	36,805	33,170
1959-60	1,68,725*	2,95,546 (Estimated)	1,00,341	57,400

*sanctioned upto 15th October, 1959.

(c) *Activities*

37. The Study Group of the Committee which visited the Birbal Sahni Institute of Palaeobotany were informed that the Government had sanctioned a joint expedition with a Japanese Botanist, under the leadership of the Institute, to Bhutan and Sikkim in March-April, 1960 but that the financial aid sought for the purpose had not been sanctioned so far. The representative of the Ministry stated in the course of evidence that sanction for the expedition was given on the understanding that the Institute would meet the expenditure out of its own budget savings. Since, however, the Institute had not been able to

find funds for the purpose, *the Committee suggest that the request may be sympathetically considered and an early decision taken thereon.*

38. The Committee were further informed that a proposal had been received recently by the Ministry to get a foreign expert for the post of Director for the Institute. Attempts were being made to get assistance for the purpose under the Colombo Plan or the T.C.M. *The Committee recommend that the Ministry should endeavour to fill up the post at an early date as it has remained unfilled for long.*

39. The Institute is a unique one of its kind. Very few countries have facilities for palaeobotanical studies and research. *The Committee suggest that the feasibility of developing the Institute into an International Centre for Palaeobotanical Research as also providing assisance for inviting palaeobotanists from other countries to work there may be examined.*

E. National Institute of Sciences of India

(a) *Introductory*

40. At the 21st session of the Indian Science Congress held at Bombay in 1934, the late Prof. M. N. Saha, in his presidential address, suggested a scheme for the formation of an Indian Academy of Sciences on the model of the Royal Society of London. The General Committee of the Indian Science Congress thereupon appointed a committee to draft a constitution for such a national institute. Following the recommendations of the Academy Committee, the National Institute of Sciences of India was established in 1935 with its headquarters at Calcutta. In 1946 its headquarters were shifted to Delhi.

41. The objects of the Institute are—

(a) the promotion of natural knowledge in India including its practical application to problems of national welfare;

(b) to effect co-ordination between scientific academies, societies, institutions and government scientific departments and services;

(c) to act as a body of scientists of eminence for the promotion and safeguarding of the interests of scientists in India; and to represent internationally the scientific work of India;

(d) to act through properly constituted national committees in which other learned academies and societies will be associated, as the National Research Council of India, for undertaking such scientific work of national and international importance as the Council may be called upon to perform, by the public and by the Government;

(e) to publish such proceedings, journals, memoirs and transactions, and other publications as may be found desirable;

(f) to promote and maintain liaison between science and letters;

(g) to secure and manage funds and endowments for the promotion of science; and

(h) to do and perform all other acts, matters and things that may assist in, conduce to, or be necessary for the fulfilment of the above mentioned aims and objectives of the Institute.

(b) *Expenditure*

42. Following are the figures of expenditure incurred by the Institute and of the grants-in-aid given by the Government of India during the years 1956-57 to 1959-60:

Year	Expenditure incurred	Grants-in - aid received from the Government of India
	Rs.	Rs.
1956-57 (Actuals)	3,43,651	3,40,000
1957-58 (Actuals)	3,55,260	3,50,000
1958-59 (Actuals)	4,31,279	4,26,000
1959-60 (Estimates)	6,12,400	6,07,000

The difference in the figures under cols. (2) and (3) above is made up by the receipts from sale of publications.

(c) *Activities*

43. The main lines of activity of the Institute are as under:

(i) Awarding of research fellowships;

(ii) Publication of Journals;

(iii) Payment of grants to scientific societies for development of scientific journals;

(iv) Building up of a reference library; and

(v) Election of Fellows.

44. The Study Group of the Committee which visited the Institute were informed that it had been recognised by the Government of India as the premier society representing all branches of science in India. *The Committee suggest that the question of developing it on the lines of the Royal Society of the U.K. may be considered by the Ministry.*

45. *The Committee further recommend that the following schemes put forward by the Institute should be expeditiously examined*:

(i) *Institution of research professorships or readerships in various universities as done by the Royal Society of the U.K.*

(ii) *Publication of the scientific works, of eminent scientists in the country; and*

(iii) *Preparation of the History of Sciences of India.*

Apart from the solitary work on the History of Indian Chemistry by Dr. P. C. Ray, there is no authoritative publication setting out tne History of Sciences of India. Every advanced country has given priority to this subject. *It is high time that the Ministry should act without delay, for it is bound to take a long time to complete the task. The Committee are of the view that this work should be given high priority.*

III. NATIONAL RESEARCH DEVELOPMENT CORPORATION OF INDIA

A. Introductory

46. Prior to the setting up of N.R.D.C. in 1953, the Industrial Liaison Committee which dealt with the patents and processes arising out of researches sponsored by the Council of Scientific and Industrial Research and the Patents Advisory Committee which was concerned with exploitation of Government owned patents, both functioning under the Ministry of Commerce and Industry, were responsible for commercial utilisation of laboratory researches. The gap between research and development was a wide one and to bridge it effectively a specialised organisation devoting itself exclusively to this work was considered necessary. The Council of Scientific and Industrial Research, therefore, proposed the setting up of National Research Development Corporation of India for this purpose, on the lines of similar organisations established in the U.K. in 1949 and in Canada in 1947. This recommendation was supported by the Planning Commission and was accepted by the Government of India in April, 1953. It was later decided that the Corporation should be set up as a government owned private limited company under the provisions of the Indian Companies Act, 1913. The Corporation was registered on the 31st December, 1953.

B. Organisational Set up and Functions

47. A chart showing the organisational set up of the National Research Development Corporation is given as Appendix IV.

48. The Board of Directors has been reconstituted with effect from the 1st January, 1960 and the composition of the new Board is as under:

1. Prof. M. S. Thacker, Secretary to the Government of India, Ministry of Scientific Research and Cultural Affairs and Director General Scientific and Industrial Research.
2. Shri A. V. Venkateshwaran, Joint Secretary to the Government of India, Ministry of Finance, New Delhi.
3. Dr. G. P. Kane, Senior Industrial Adviser, Ministry of Commerce and Industry, New Delhi.
4. Dr. B. D. Kalelkar, Senior Industrial Adviser, Ministry of Commerce and Industry, New Delhi.
5. Dr. K. S. Krishnan, Director, National Physical Laboratory, New Delhi.
6. Dr. K. Venkataraman, Director, National Chemical Laboratory, Poona.

7. Shri T. R. Gupta, c/o Messrs. Jay Engineering Works Ltd., Calcutta.
8. Dr. M. D. Parikh, c/o Messrs. National Rayon Corporation Ltd., Bombay.
9. Shri Anantaramakrishnan, c/o Messrs Simpson & Co. Ltd., Madras.
10. Shri B. D. Kapur, c/o Messrs. Atlas Cycles Ltd., Sonepat, Punjab.

49. The main function of the NRDC is to stimulate development of patents and inventions of research institutions financed out of public funds and such others as may be voluntarily assigned to it by any institution or individual. The Corporation acquires by agreement and negotiations the development rights of patents and inventions. The objects for which it has been established are set out in Appendix V.

50. In addition to catering to the needs of CSIR laboratories, the Corporation affords facilities for research development to other research organisations like the Indian Council of Agricultural Research, Commodity Committees like the Indian Lac Cess Committee, Government and private research institutions like the Forest Research Institute, Dehradun; National Sugar Institute, Kanpur; Indian Institute of Science, Bangalore; Shri Ram Institute for Industrial Research, Delhi; and Universities like Jadavpur and private individuals.

51. Development of inventions is secured by (a) arranging large scale trials in co-operation with industry (b) sponsoring and financing pilot plant investigations and (c) licensing patents and inventions to industrialists for commercial production.

C. Estimates and Actual Expenditure

52. The details of actual expenditure incurred during the last three years together with the budget estimates for 1959-60 are as under:

Year	Capital	Developmental	Administrative	Total
1	2	3	4	5
	Rs.	Rs.	Rs.	Rs.
1956-57				
Estimates .	2,00,000	52,000	1,48,000	4,00,000
Actuals .	7,674	36,076	1,20,978	1,64,728
1957-58				
Estimates	1,80,000	57,000	1,73,000	4,10,000
Actuals	27,195	55,078	1,51,362	2,33,635

1	2	3	4	5
1958-59				
Estimates	4,00,000	1,65,000	2,29,000	7,94,000
Actuals	2,58,114	1,33,608	2,33,361	6,25,083
1959-60				
Estimates	7,00,000	2,25,000	2,41,000	11,66,000

53. It was stated that the large shortfalls in the capital expenditure and to some extent in the developmental expenditure as compared to the sanctioned estimates arose mainly on two grounds *viz.*, the diversion of pilot plant work from NRDC to the CSIR laboratories in respect of processes developed in the latter and the uncertainty in the volume of developmental work that the Corporation may be called upon to take up.

54. It was added that since the role of NRDC was that of development, its activity was closely linked with the output of researches from the various institutions capable of commercial exploitation and since it was not possible to forecast this output it was difficult to estimate with any degree of precision the requirements of capital expenditure for the developmental projects. It was further stated that attempts had been made to obtain in advance from the research institutions an idea of the likely requirements but so far the information available had been inadequate and uncertain. The Committee were informed that the estimated figures of Rs. 7 lakhs for capital expenditure in the budget of the Corporation for 1959-60 as against the actuals of Rs. 2·58 lakhs in 1958-59 were not based on any forecasts of expenditure 'reliable or otherwise'. *The Committee consider it extremely doubtful whether even a moiety of the provision would be actually utilised. They suggest that some method may be devised to arrive at a more realistic figure for inclusion in budget estimates in future.*

D. Projects Undertaken

55. The Committee were informed that where an examination of the results reported from research laboratories revealed that further investigations by way of pilot plant work or large scale trials in industry were indicated, a detailed project estimate showing capital and recurring expenditure was prepared in consultation with the research institutions concerned for approval by the Board of Directors.

56. The pilot plant projects were stated to be of two categories *viz.* (i) those instituted by research laboratories themselves at their own cost, and (ii) those sponsored by the NRDC in which case all cost,

capital as well as recurring, was borne by the NRDC. A list of pilot plants projects sponsored by NRDC so far is given in Appendix VI. The details of capital expenditure incurred on the projects during the last three years are as under:

	1956-57	1957-58	1958-59	Total
	Rs.	Rs.	Rs.	Rs.
Deionisation of cane juice .	7,674	15,769	78,814	1,02,257
Fluidised bed technique for textile processing . .	..	11,426	53,059	64,485
Phathalic Anhydride . .		..	1,24,036	1,24,036
White Cement from Felspar	..	..	2,205	2,205
	7,674	27,195	2,58,114	2,92,983

E. Results achieved

57. The following table shows the results achieved so far by the Corporation since its setting up:

	Upto 31-3-55	1955-56	1956-57	1957-58	1958-59
No. of Inventions reported (Progressive) .	177	254	388	477	503
No. of Projects instituted (Progressive) .		4	8	11	11
No. of processes licensed (Progressive) .	8+8	16+5	21+7	28+16	44+25
Expenditure on Projects (Actuals):					
		Rs.	Rs.	Rs.	Rs.
(*a*) Capital .	Nil	Nil	7,674	27,195	2,58,114
(*b*) Recurring .	Nil	5,956	36,076	55,768	1,33,608
Income from licenses :					
	Rs.	Rs.	Rs.	Rs.	Rs.
(*a*) Premia .	29,500	89,000	23,000	62,500	1,46,500
(*b*) Royalties .	524	8,943	14,132	13,993	19,241

58. A statement showing the position of patents and processes referred to NRDC as on 31-8-59 is given in Appendix VII and a list of processes licensed by the Corporation is given in Appendix VIII wherein those in commercial production are indicated by an asterisk. These appendices show that out of 530 processes referred to NRDC, 72 have been licensed out of which 32 are in production. Processes released free of royalties are 71, and those abandoned number 100. The representative of the Corporation stated that this record was almost the same as that of the NRDC of U.K.

59. It is also seen from Appendix VIII that in a number of cases there is a considerable time lag ranging upto five years in some of them between the date of reference of processes to NRDC and the date of agreement for commercial utilisation. The Committee were informed that the time taken for the development of a process varied in each individual case. Normally, if the laboratory investigations were complete and all the data for setting up commercial plant could be provided, it would take six months to one year to entrust the process to a firm for commercial development. Where such information was not readily available and had to be obtained by correspondence, the period might extend to two years or so. In cases however where field trials, consumer acceptability tests or pilot plant work were to be undertaken it might take anything upto four to five years to successfully develop a process.

60. Some of the reasons for delays in the commercial exploitation of projects referred to NRDC were stated to be—

(i) Projects were reported at a very preliminary stage and considerable time was taken by research laboratories in completing laboratory investigation and/or pilot plant trials.

(ii) Time taken in obtaining information on technical and economic aspects from research laboratories and/or other sources.

(iii) Time taken in consumer acceptability trials.

(iv) In some cases, time was consumed in pilot plant experimentation and/or large scale trials.

(v) Prolonged negotiations for commercial development.

(vi) Time lag between the issue of non-technical note and the receipt of adequate offers.

(vii) Time taken by laboratory to supply detailed information necessary to start commercial production.

(viii) Besides the factors cited above, appreciable time was taken by industry in establishing commercial production in most cases due to difficulties in obtaining detailed

designs and drawings of machinery and equipment, its fabrication or procurement and installation, availability of power and other facilities. In a majority of cases considerable time was taken in obtaining licenses for import of machinery and raw materials not available from indigenous sources.

61. *The Committee regret the time lag in the commercial exploitation of a process after its development. They recommend that the Corporation should take effective steps to reduce this time lag by fostering contacts, both formal and informal, between the scientists and engineers engaged in research and the enterpreneurs in industry who can appreciate the value and potentialities of researches in progress and who are inclined to take advantage of them. For this purpose, it should have on its staff technical personnel who can maintain close relationship with the heads of the research institutions as well as with the top management of the industry in the country.*

62. *The Corporation should obviously not feel that its task is over with the presentation of a process to the industry. The Committee are of the view that it should persuade the industry to take up production as quickly as possible and play a positive role in helping the industry to overcome delays, procedural and others, in the development and commercial exploitation of a process.*

63. One of the reasons for delay in the commercial exploitation of scientific researches was stated to be want of an organisation for designing and developing research equipment and pilot plants. In order to overcome this, a Central Instruments Organisation had been set up under the CSIR. The Ministry of Commerce and Industry have also under consideration a scheme to set up institutes for designing and developing tools, precision instruments etc. in different regions. *The Committee suggest that this scheme should be finalised early in consultation with the NRDC and the CSIR.*

64. The Committee were informed that goods worth Rs. 3.25 crores would be produced from inventions licensed by the NRDC by the year 1960-61. The following table shows the value of goods produced by the processes licensed by the Corporation since its inception and the foreign exchange saved thereon:—

Year	Value of Goods produced.	Foreign Exchange Saved
	Rs.	Rs.
Upto 31-3-56	11,77,120	2,94,747
1956-57	3,93,194	1,35,087
1957-58	3,78,280	1,71,710
1958-59	9,07,015	5,50,000
	28,55,609	11,51,544

In addition, a sum of Rs. 50,000 was received in 1955 as premium on the process of 'Carbion' from Dr. C. Otto & Co. of West Germany.

65. *The Committee were surprised to learn from the representative of the Corporation that certain incomplete processes were reported prematurely to NRDC by the national laboratories. The Committee have also referred to this in para 69 of their Seventy sixth Report on the Ministry. They cannot over-emphasise the need for a careful scrutiny being exercised before processes are reported for commercial exploitation.*

66. *It is hardly necessary for the Committee to emphasise the importance of the role that the NRDC has to play in the scheme of things. The Committee are appreciative of the efforts that are being made by the NRDC to fulfill its objectives but, judging from the paramount need of the country to forge ahead in industrial expansion and of securing favourable balance of payments by savings in foreign exchange, they cannot feel satisfied with the progress as revealled by the results. With the increasing outlay on research whose overall benefits can be assessed solely in terms of their utilisation in the field, the Committee would like the NRDC to energise its activities for the better fulfilment of its avowed objectives. While suggesting that the Corporation should pursue vigorously the development of all patents and processes, the Committee would like it to pay particular attention to those which may result in the saving of foreign exchange.*

F. **Financial Results of Working**

67. The following are the figures of excess of expenditure over income revealed by the accounts of the Corporation during the years of its existence:

		Rs.
1954-55	..	52,456
1955-56	..	64,608
1956-57	..	1,19,014
1957-58	..	1,58,000

68. The Committee are informed that the developmental nature of activities and the novel field of operation are the main factors responsible for the excess of expenditure in the initial stages of working of the NRDC, a feature not peculiar to this Corporation. It had been recognised even in the early stages that quite an appreciable time must elapse before the income of the Corporation is sufficient to meet its expenditure. In 1953, when the NRDC was set up, the Ministry of Finance placed this time interval at about ten years. It was stated that even in an industrially advanced country like the U.K., the NRDC after working for ten years had not been able to balance its budget and deficits in its working presisted despite the fact that 100 per cent. of the royalties earned were being credited to its funds.

69. The representative of the Corporation informed the Committee during his evidence that it would be possible to balance the income of the Corporation with its expenditure by the end of the Third Plan. *The Committee suggest that the Corporation should periodically review the position and make efforts to see that it attains self-sufficiency at least by that period.*

G. Apportionment of Income from Premia and Royalties

70. The main sources of income of the NRDC are premia and royalties received from the licensing of patents and processes. At present, these are being apportioned in the ratio of 30 per cent. to NRDC and 70 per cent. to the research organisations from which the inventions originate. The Committee were given to understand that proposals to revise the ratio in favour of the NRDC on the lines of the practice obtaining in the U.K. where the entire royalties are credited to the NRDC, put up more than a year back, are still under consideration. *The Committee are unable to see why the matter should be kept pending for such a long time. They suggest that early decision should be taken in the matter and while so doing the objective of making the Corporation self-sufficient kept in view.*

H. Directives by Government

71. Sub-section 1 of Section 4 of the Development of Inventions Act, 1948 of the U.K. provides that "The Board of Trade may, after consultation with the Corporation, give to them directions of a general character as to the exercise of their functions, and the Corporation shall comply with such directions." Sub-section 4 of that section further provides that ".... the Report for any year shall set out any direction given to the Corporation under sub-section (1) of this section during that year unless the Board have notified to the Corporation their opinion that it would be against the national interest so to do."

72. When asked about the position in India, the representative of the Ministry stated that although the President had the power to issue directives to the Corporation, no such directives had actually been issued so far. As the activities of the Corporation expand, occasions may arise in future for the issue of such directives. There is however at present no provision for incorporating any such directives received, in the annual reports of the Corporation as is the case in the U.K. *The Committee suggest that the question of having such a provision under Article* 127 *of the Article of Association of the Corporation may be examined by the Ministry.*

I. Borrowing Powers of the Corporation

73. The authorised capital of the Corporation is Rs. 1 crore of which the subscribed capital is Rs. 10 lakhs which is fully paid up. The Committee understand that a decision has been taken to provide additional funds required by the Corporation only in the shape of long dated loans either free of interest during the first few years or

carrying low rate of interest. The representative of the Corporation informed the Committee during evidence that no limit had been set on the borrowing powers of the Corporation. *The Committee recommend that the Ministry should define the borrowing powers of the N.R.D.C. by placing a suitable limit thereto as in the U.K. This will enable Government to review the working of the Corporation at regular intervals as is done in the U.K. Such a financial review may assume greater importance in the years to come with the expansion of its activities.*

J. Review

74. As state above, the Corporation was set up in December, 1953. Since then there has been no review of its work and progress. *The Committee suggest that the question of appointing a Committee to review its functioning may be examined by the Ministry.*

IV. TECHNICAL INSTITUTIONS

A. Introductory

75. The Estimates Committee had examined 'Technical Education' as a part of their general examination of the estimates of the Ministry of Education and Scientific Research during the year 1957-58 and had presented two Reports (10th and 15th of Second Lok Sabha) on the subject. The Indian Institute of Technology, Kharagpur was dealt with in the 15th Report. During their study tours, the Study Group of the Committee also visited the following institutions this year:—

(i) Indian School of Mines and Applied Geology, Dhanbad;

(ii) Indian Institute of Technology, Kharagpur; and

(iii) Indian Institute of Science, Bangalore.

The points arising out of these visits were taken up with the Ministry and the observations and conclusions in this regard are contained in this Chapter.

B. Indian School of Mines and Applied Geology, Dhanbad

(a) *Introductory*

76. The Indian School of Mines and Applied Geology is patterned on the model of the Royal School of Mines in U.K. The institution was started in 1926 and is designed to cater to the needs of technical personnel for coal mining and other mineral industries in the country, the Geological Survey of India and the Mines Inspectorate. It has so far produced 830 mining engineers and geologists who are holding posts of responsibility both in Government and in private organisations. In regard to management, the School has had a chequered history. It was successively under the Ministry of Labour, Ministry of Steel, Mines and Fuel etc. before coming under the Ministry of Education and Scientific Research in 1957.

(b) *Administration*

77. The Committee were informed that the Governing Body of the School originally consisted of 16 members and had the Director, Geological Survey of India as its Chairman. At that time the School was under the Ministry of Natural Resources and Scientific Research which was also administering the Geological Survey of India. Subsequently it was transferred to the Ministry of Steel, Mines and Fuel along with the Geological Survey Department. Finally, when the School was transferred to the Ministry of Scientific Research and Cultural Affairs, provision was made in the Governing Council for a

representative of the Ministry of Steel, Mines and Fuel as that Ministry continued to administer the Geological Survey Department. The representative of the Ministry admitted that for purposes of co-ordination, it was necessary that the Director of the Geological Survey of India himself was represented on the Governing Council. *The Committee, therefore, suggest that the Director, Geological Survey of India, should be included in the Governing Council of the School.*

78. The Committee understand that the question of empowering the Governing Council to accord administrative approval and expenditure sanction for works upto Rs. 10 lakhs in each case as was the position before November, 1957 when the procedure was revised, was under discussion with the Ministry of Works, Housing and Supply. *Delegation of such powers to the Governing Council should be examined and an early decision arrived at as the Committee feel that this would accelerate the tempo of construction work.*

79. In order to meet the plan requirements of technical personnel a large scale development of the Institute as a centre of education and training in mining, applied geology, applied geophysics and petroleum technology has assumed vital importance. The existing set up of the Institute, in which it is administered quasi-departmentally, is stated to be a serious hurdle in the way of such development for, under the present procedure, construction, purchase of stores and recruitment follow the same pattern as in Government departments leading to considerable delays. The Governing Council was therefore unanimously of the view that the School should be given autonomous status.

80. The School was affiliated to the Bihar University which awarded conventional degrees. However, it was open to the students to take the diploma examinations of the School also. This latter alternative, it was urged, did not recognise the level of training and market value of the candidated who qualified in the courses of the School. The Committee suggest that the question of giving autonomous status to the School with power to award its own degrees may be examined by the Ministry.

(c) *Name of the School*

81. As already stated, the Institution was patterned on the Royal School of Mines both in its name as well as in the course of training in mining and geology. On the recommendation of the Reorganisation Committee (1947) the name of the Institution was changed from "Indian School of Mines" to "Indian School of Mines and Applied Geology". Two new courses in Applied Geophysics and Petroleum Technology have, however, since been started. The Committee thus find that the present name of the School is not appropriate. The representative of the Ministry during his evidence shared this opinion. It appears to the Committee that the original name which was a simple one, would have served the purpose well, as it would obviously not be possible with the increasing field of its activities, to include in its name

every subject taught in it. *The Committee therefore suggest that the question of suitably changing the name of the School may be examined.*

(d) *Expenditure*

82. Following are the figures of expenditure as against the budget estimates of the School during the last 3 years:—

Year	Budget Estimates	Actual Expenditure	Shortfall
	Rs.	Rs.	Rs.
1956-57	16,63,000	9,79,518	6,83,482
1957-58	21,16,000	14,00,283	7,15,717
1958-59	18,57,000	10,78,738	7,78,262

83. The reasons of shortfall were stated to be:—

(i) Posts remaining unfilled;

(ii) Delay in sanction by Government; and

(iii) Want of expenditure sanction, delay in granting import licence and in release of foreign exchange by Government.

84. In respect of the saving of Rs. 6,95,525 under the head 126-Capital during 1957-58 (out of the total saving of Rs. 7,15,717), it was stated that the sanction was received as late as in January 1958 and hence it was not possible to spend the amount out of a provision of Rs. 9,41,000 made in the budget. *The Committee are of the view that intimation of expenditure sanction towards the fag end of the financial year and the occurrence of huge shortfalls year after year depict an unsatisfactory state of affairs calling for immediate remedial measures.*

(e) *Staff*

85. The Study Group of the Committee which visited the School learnt that there was provision for the post of a Director as well as a Principal though the latter post had not been filled up since it fell vacant in 1956. The Committee do not see any justification for the posts of a Principal as well as a Director. They find that the reorganised plan of expansion of the Institute also provides for the appointment of the Director as the academic and administrative head of the Institute in place of the Principal. *The Committee, therefore, suggest that the post of the Principal may be abolished. At the time of factual verification, the Ministry intimated that the post had been abolished with effect from the 29th October,* 1959.

(f) *Reorganised plan of Expansion of the School*

86. In order to cope with the developments in mineral industry, it was considered necessary to expand the institution and take larger number of students every year. An expansion scheme for the Institution under the Second Five Year Plan was mooted by the late Dr. Bhatnagar, the then Secretary to Government. The scheme underwent several scrutinies by different committees and sub-committees and was now in the hands of the Government for final approval and implementation.

87. The details of the reorganised plan of expansion, which is estimated to cost Rs. 122 lakhs, are:—

(a) Expansion of existing facilities in Mining Engineering and Applied Geology courses by raising the annual rate of admissions as under:—

Mining Engineering from	45 to 90
Applied Geology from	10 to 20;

(b) Introduction of new courses in Petroleum Technology and Applied Geophysics with an annual intake of 20 students in each course;

(c) Appointment of the Director as the academic and administrative head of the Institute in place of the Principal;

(d) Creation of certain new categories of posts *e.g.* Senior Professor, Asstt. Professor, Asstt. Lecturer and Registrar etc.;

(e) Upgrading of the scales of pay of the teaching staff; and

(f) Construction of residential and non-residential buildings.

88. The Committee were told during the course of evidence that some of the proposals were under implementation and that the plan of expansion as a whole had been accepted by the Governing Body of the School and that the Ministry was considering it. *The Committee are of the view that the reorganised plan of expansion of the School should be finalised and implemented without further delay so that the development plans of the Institution may make a rapid headway failing which the implementation of the country's mining programme in the Third Plan is likely to be affected adversely for want of requisite technical personnel.*

(g) *Endowment of Chairs*

89. The Study Group of the Committee were informed that there were no endowments of chairs of any kind by the mining industry in the School. *The Committee recommend that efforts should be made to obtain endowments of chairs and research scholarships in the Institute from the mining industry. The Committee trust that the public sector which occupies an important place in this industry will come forward with a generous measure of support to it and set an example for others to follow.*

(h) *Admissions, Scholarships, etc.*

90. The Study Group of the Committee were informed that the entrance examination for admission to the School is held each year in the beginning of May at the following centres:—

1. Dhanbad,
2. Calcutta,
3. Bombay,
4. Madras,
5. Delhi,
6. Nagpur,
7. Patna,
8. Lucknow, and
9. Cuttack.

91. A statement showing the number of applicants for admission and number of students actually admitted, State-wise, during the last 3 years is given as Appendix IX. It is seen that there is no centre for the examination in some States. *The Committee feel that the smaller number of applicants from these States may partly be the result of the absence of such a centre within these States as it entails travelling a long distance to appear for the examination. They suggest that centres for the entrance examination of the School may be opened in the Capitals of the States which do not have such centres.*

92. *The Committee further suggest that other things being equal, the question of giving some preference to the children of miners both in regard to admission and award of scholarships may be considered.*

(i) *Research facilities*

93. The Committee were informed that though facilities for research work at the School have been meagre, the staff of the Institution had from time to time contributed important original papers and that studies on Indian Coals, particularly on their washability, undertaken at the School, formed the groundwork for the formation of the present Central Fuel Research Institute. *The Committee suggest that the Ministry should take positive steps to encourage research work at the School and provide adequate facilities therefor.*

94. The Committee understand in this connection that a proposal to provide a coal mine to the School for training and research purposes was made under the earliest scheme of development but was dropped on financial grounds. *The Committee recommend that the proposal may again be examined* de novo.

C. Indian Institute of Technology Kharagpur

(a) *Expenditure*

95. The actual expenditure of the Institute as also the *per capita* expenditure per student during the last 3 years and the budget estimates for 1959-60 are as under:—

	Expenditure	Per capita Expenditure
	Rs.	Rs.
1956-57	55,82,949	2,730
1957-58	52,95,413	2,980
1958-59	64,75,929	2,806
1959-60 (B.E.)	1,16,51,850	..

96. The ratio of expenditure on administration to the total expenditure of the Institute in 1958-59 has been stated to be 11·46% (excluding expenditure on buildings, construction and equipment). *The Committee suggest that a comparison be made in this regard with similar scientific institutes in the country and abroad to see if the charges are unduly high and if some reduction is possible.*

(b) *Staff*

97. The following figures show the staff position in the Institute during the years 1957-58 and 1958-59:—

	Total No. of posts sanctioned	Total No. in position
1957-58	304	249
1958-59	334	259

98. The Committee learn that while 74 posts were filled in 1957-58 and 85 in 1958-59, during the same period 43 teachers left the institution. Besides, 5 posts of Senior Professors and 3 posts of Professors had to be downgraded because persons with requisite qualifications were not available. *The Committee suggest that the question of suitably improving the prospects for qualified and experienced personnel may be examined.*

99. A statement giving the strength of staff, category-wise, actually in position in the Institute during each of the last three years is given in Appendix X. A perusal of this statement indicates that the strength of Class III and IV staff is on the high side. *The Committee invite attention in this connection to the following recommendation made by them in para 12 of their 15th Report (Second Lok Sabha)*:—

> "The Committee feel that the increase, more especially in the category of 'other supporting staff', was disproportionate

to the increase in the number of students . . . . . In comparison with the standard laid down by the Sarkar Committee, the strength of staff in the Institute is excessive. The Committee suggest that the entire position should be carefully reviewed so as to reduce the strength of staff to actual requirements or alternatively to increase the admission of students to the original figure contemplated by the Sarkar Committee so that *per capita* expenditure can be brought down".

The Committee suggest that so far as Class III and IV staff is concerned, a job analysis of the work may be done with a view to effect economies.

(c) *Scholarships offered in Post-graduate Courses*

100. A statement showing the sanctioned quota for each post-graduate course in the Institute and the number of scholarships offered during the last 3 years is given in Appedix XI. The Committee were informed that the number of scholarships was related to the intake capacity in each course and that the overall number was fixed at 60% of the total sanctioned intake. Of these, 50% were earmarked for each of the courses and the rest were at the discretion of the Director who allotted them to those courses where some incentives had to be given in order to induce students to avail of those facilities. The more popular courses were industrial and foundry engineering. In some of the other courses, which were not so popular, the sanctioned capacity was not fully utilised.

101. The Study Group of the Committee were informed that due to financial difficulties the candidates in majority of cases preferred to take up jobs rather than go in for post-graduate courses. *In order to attract students of merit to these courses, the Committee suggest that the scholarships may be offered on a larger scale so that no such students are denied opportunity for higher studies on the mere ground of want of finance. The additional expenditure thereon will be well spent if it results in a greater number of qualified technologists specialising in their subjects for which facilities already exist. This would also ensure that the capacity of the Institute in various courses is fully utilised.*

(d) *Endowment of Chairs*

102. The representative of the Ministry further informed the Committee that apart from personal approaches, no special efforts had been made to get endowments of chairs at the Institute from well known industrial houses. The response from the industry so far was poor. *The Committee suggest that greater efforts should be made to secure endowment of chairs or institution of research fellowships as obtains in foreign technical institutions.*

(e) *Selection of students by Industry*

103. The Study Group of the Committee were informed during their visit to the Institute that in the U.S.A. it was the practice for the

industrialists to go to various institutes to see the work of the final year students and make selections according to their requirements. A similar procedure was being introduced in Kharagpur and teams from TISCO and naval authorities had already visited the Institute. *The Committee suggest that efforts may be made to encourage this wholesome practice in respect of other similar Institutes in the country.*

(f) *Co-ordination with other Scientific Bodies*

104. The Committee understand that co-ordination between the Institute and the Geological Survey of India is confined to exchange of technical information and not in the sense of a co-ordinated programme of activity for geophysical prospecting as such. The students are sent for training in that Department. The Committee further understand that the Geophysics Department of the Institute has undertaken studies about the standard methods of locating underground water around Hijli area and recommended several sites for drilling. *The Committee suggest that the results of these studies may be published.*

(g) *Equipment*

105. The Study Group of the Committee were also informed that a good portion of the equipment was reparations equipment and was outmoded. *The Committee suggest that a phased programme for the replacement of the outmoded and obsolete equipment may be drawn up and incorporated in the Third Plan.*

D. Indian Institute of Science, Bangalore

(a) *Introductory*

106. Realising the vital role that science could play in the advancement of the country, Mr. Jamsetji Nusserwanji Tata conceived, in the year 1896, the idea of founding a research university for advanced study and research in pure and applied sciences. He set aside properties of considerable value in Bombay as an endowment for the purpose. The then Viceroy of India, Lord Curzon, and the Dewan of Mysore helped in the establishment of the Institute by providing further financial support from their respective governments. In 1907, the Government of India passed a Vesting Order by creating a trust for implementing and perpetuating the wishes of the donor. The first batch of students was admitted in 1911.

107. The main object of the Institute is "to provide for advanced instruction and conduct original investigations in all branches of knowledge and in particular in such branches of knowledge as are likely to promote the material and industrial welfare of India."

(b) *Administration*

108. Under the present scheme which came into force in 1951, the authorities of the Institute are:—

(a) The Visitor (The President of India is the *ex officio* visitor of the Institute);

(b) The Court;
(c) The Council;
(d) The Finance Committee;
(e) The Senate;
(f) The Faculties;
(g) The Board of Management;
(h) The Board of Trustees; and
(i) The Director.

(c) *Finance*

109. Till about ten years ago, a major part of the income of the Institute was derived from the Founder's endowment and the contributions by the Governments of India and Mysore. The post war expansion of the activities of the Institute was made possible by a non-recurring grant of approximately Rs. 2,01,68,000 for buildings and equipment etc. sanctioned by the Government of India. The *ad hoc* recurring grants sanctioned from time to time for various expansion activities were consolidated in 1953 by the Government of India in an annual grant of Rs. 21 lakhs for the quinquennium 1953-58. On the basis of the recommendation of the Reviewing Committee 1955, this has been enhanced to Rs. 37 lakhs for the quinquennium 1958-63. The break up of this amount is as follows:—

	Rs.
Cost of existing staff	21,31,431
Cost of additional posts	1,73,017
Working expenses	12,15,000
Fellowships and Scholarships	6,53,000
Director's discretionary grant	20,000
Revision of scales	40,774
Visits to and exchange of staff with industry	10,000
Contribution to Gymkhana	7,000
Strengthening of cadres and alterations in scales of Central Office Staff	17,000
Depreciation Fund	1,00,000
TOTAL	43,67,222
Less Receipts	7,22,521
Say	37,00,000

110. In the Second Plan, a sum of Rs. 75 lakhs has been allotted to the Institute. This would be utilised to implement the recommendations of the Reviewing Committee and the expenditure would be Rs. 48 lakhs recurring and Rs. 27 lakhs non-recurring.

(d) *Conferments*

111. From July 1946 onwards, the Institute has been awarding diplomas (D.I.I.Sc.) to those who have successfully undergone the courses of study in place of the Certificate of Proficiency which it used to award under the Vesting Order of 1909. In 1952, provision was made for conferring the title of Member of the Institute (M.I.I.Sc.) equivalent to the Ph. D. degree of a university for research work. On the recommendation of the Reviewing Committee the Institute has been declared as an University under the U.G.C. Act, 1956.

(e) *Training and Research*

112. Since the Institute was established, 2500 students have been trained and nearly 400 post-graduate students and research workers are engaged at present in the various Departments of the Institute. During the last world war, it took up a large number of schemes of research sponsored by the CSIR, ICAR, ICMR, the Government of Mysore and other State Governments. It also carried out a number of investigations for defence services.

(f) *Research on Gas Turbines*

113. The Tata Committee had recommended that "the bulk of the research effort on gas turbine development in India should be centered in the Indian Institute of Science, Bangalore." In pursuance of this recommendation and at the instance of the CSIR, the Planning Commission allocated a sum of Rs. 15 lakhs for the starting of the research centre on gas turbines at the Indian Institute of Science in the Second Plan.

114. The representative of the Ministry informed the Committee that subsequently the CSIR and the Tata Committee felt that such a centre should be set up in the industry and not in a teaching institution. A beginning in this direction was therefore to be made at Kanpur. Ultimately, however, this would be shifted back to Bangalore where, according to the decision already taken, the gas turbines and the jet engines factory would be located. The Tata Committee had now been asked to go into the matter and make further recommendations as to what could be done at the Bangalore Institute and two other Institutes where teaching and certain amount of research on gas turbines was to be encouraged.

115. The Committee understand that the Institute has been assisting the gas turbine development work going on at the Hindustan Aircraft Factory. At the request of H.A.L., investigations have been in progress since March, 1958 to assess the characteristics of a new design of air intake for aircraft powered by turbojet engines. Besides, a number of other investigations have been carried out in the Institute in the recent past in the field of gas turbines. ***The Committee, therefore, recommend that the Institute should be assisted to take up further research in gas turbine work.***

(g) *Central Instruments and Services Laboratory*

116. The last quinquennial Reviewing Committee (1955) had recommended the setting up of a Central Instruments and Services Laboratory with a glass blowing shop in the Institute and an amount of Rs. 3·5 lakhs was earmarked therefor. The Committee understand that no progress in this direction has been made so far.

117. The representative of the Ministry explained that the Institute had been informed that all the proposals as recommended by the Reviewing Committee had been agreed to subject to the condition that the expenditure should be restricted to Rs. 27 lakhs during the remaining 3 years of the Second Plan. The Institute framed certain proposals which required extra expenditure and the plan would have to go to the U.G.C. for acceptance because the Ministry was no longer concerned with it. It was, however, open to the Institute to go ahead with the implementation of the programme with the money already provided. *The Committee suggest that an early start should be made in the setting up of the Laboratory as recommended by the Reviewing Committee.*

(h) *Import Difficulties*

118. The Study Group of the Committee were further informed that the Institute suffered greatly in the matter of getting import licences and foreign exchange for essential equipment and material required. The Ministry explained that so far as gift equipment was concerned, prior approval of the Development Wing of the Ministry of Commerce and Industry and import licence therefor should be obtained before intimating acceptance of the gift so that the difficulties at present faced in obtaining clearance for goods shipped without a licence were avoided.

119. In regard to equipment purchased from abroad, it was stated that delays used to occur till about 18 months back when the licences were valid only for six months and a fresh licence had to be taken from the Chief Controller of Imports if the equipment could not be obtained within that period. The Committee were informed that the procedure had since been simplified and a separate allocation was given to the Ministry for dealing with requests for foreign exchange from non-Government institutions. However, the paucity of foreign exchange was a common difficulty faced by all importers.

120. *The Committee suggest that the Ministry should impress upon the Institute the desirability of obtaining the prior concurrence of the Development Wing of the Ministry of Commerce and Industry before obtaining the equipment under the gift programme so that the licence is obtained by the time the equipment is received at the port. The Committee consider that by advanced planning the difficulties in procurement of foreign exchange may be minimised.*

(i) *Staff Quarters*

121. The Study Group of the Committee were further informed that only 20 out of 157 members of the staff had been provided with

residential accommodation and the Institute was hard pressed for want of accommodation for its staff. The representative of the Ministry stated that it would not be possible to proceed with the scheme of providing residential accommodation to the staff as the loan together with 5% interest thereon would have to be paid and also the buildings would have to be maintained out of the rent receipts which was not possible at present. He stated that proposals were being formulated for giving financial assistance to all the technological institutions by providing half the money required as grant and the rest as loan. He further added that the total demands of the various institutions would be met to the extent of at least 20 to 25% in the Third Plan if these proposals were accepted by the Planning Commission and the Government.

122. *The Committee suggest that suitable steps should be taken to provide adequate residential accommodation to the staff in the proximity of the Institute as it would help in the creation of a proper atmosphere of study and research. A bolder plan should be drawn up in this regard in the Third Plan. The Committee in this connection reiterate the following recommendation made in para 79 of their Tenth Report (Second Lok Sabha)*:—

> "The Committee are of the opinion that in the interest of educational advancement of the country, the teaching staff should be provided with suitable residential accommodation in the neighbourhood of the institutions concerned. The Committee have no doubt that the facility of residential accommodation will also tend to reduce the problem of the 'flight' of technical personnel."

NEW DELHI-1.
The 16th March, 1960.
The 26th Phalguna, 1881 (*Saka*).

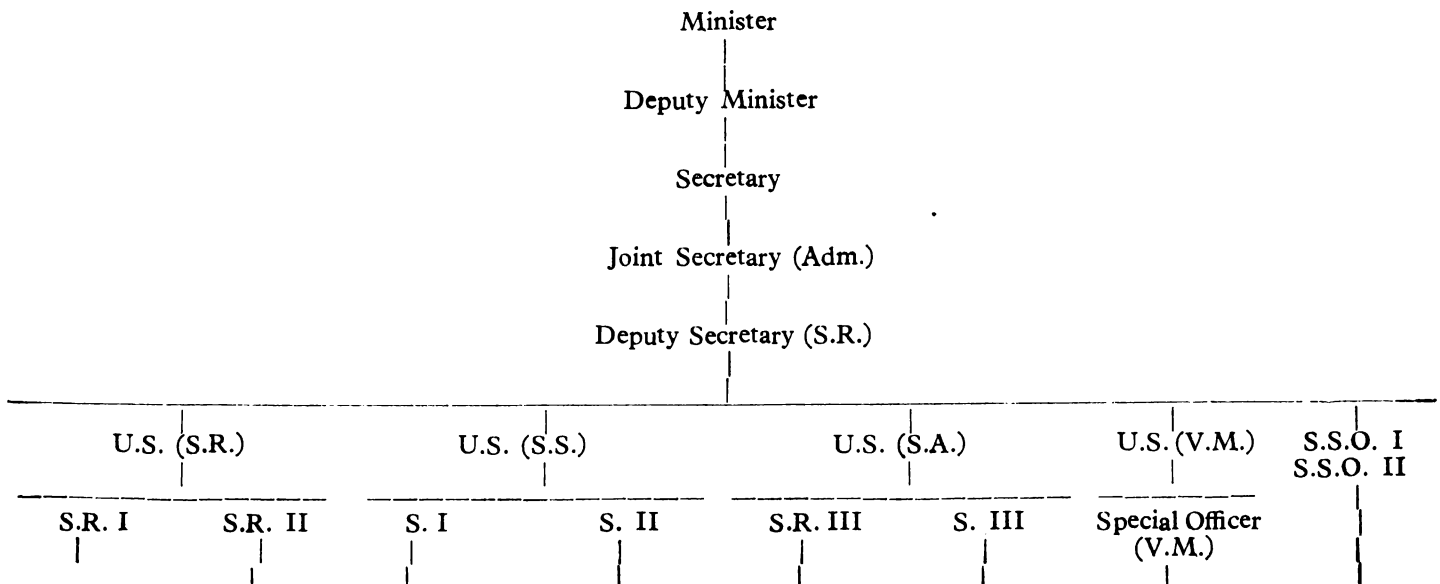
H. C. DASAPPA,
Chairman,
Estimates Committee.

APPENDICES

APPENDIX I

(*Vide* Para 3)

Chart showing the organisational set up of the Scientific Research Wing of the Ministry of S. R. & C. A.



S.O. . 1 Asstts. 4 U.D.Cs. 2 L.D·Cs. 4 (Administration of C.S.I.R.).	S.O. 1 Asstts. 4 U.D.C. 1 L.D.Cs. 4 (Grants-in-aid to Scientific Institutions and International Conferences etc.)	S.O. 1 Asstts. 4 U.D.C. 1 L.D.Cs. 4 (Administration of the Survey of India.)	S.O. 1 Asstts. 4 L.D.Cs. 4 (Administration of the B.S.I., N.A.O. and C.B.G.)	S.O. 1 Asstts. 4 U.D.C. 1 L.D.Cs. 4 (Dissemination of Scientific information, Coordination, etc.)	S.O. 1 Asstts. 2 U.D.C. 1 L.D.Cs. 4 (Administration of the Z.S.I. and the Deptt. of Anthropology)	S.O. 1 Asstts. 5 U.D.Cs. 4 L.D.Cs. 4 (Vigyan Mandirs).	Steno-typist (Advising on Scientific and Technical matters and on Vigyan Mandirs.)

(NOTE :—The S.R. Wing has no attached offices.)

APPENDIX

(*Vide Para*

Statement showing the grants paid to the Scientific Societies & Institutes during conditions for grants.

Sl. No.	Names of the Scientific Societies and Institutes	Grants paid during 1956-57		Grants paid during 1957-58	
		Recurring	Non-Recurring	Recurring	Non-Recurring
1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
1	National Institute of Sciences of India, New Delhi.	3,40,000		3,50,100	

II

20)

1956-57, 1957-58 *and* 1959, *the purpose for which such grants were paid to and*

Grants paid during 1958-59		Purpose for which grant was paid	Conditions of the grants
Recurring	Non-Recurring		
7	8	9	10
Rs.	Rs.		
4,65,000	*50,000	For meeting day-to-day expenditure on establishment, travelling allowance, N. I. S.I. Research Fellowship, Library, Publications and Contingencies. *For construction of building.	Accounts of the Institute will be open to test-check by the Comptroller and Auditor General of India at his discretion. (*i*) The construction work is carried out strictly in accordance with the specifications laid down by the C.P. W. D. and the rates are not in excess of those fixed by the C.P.W.D. for identical items. (*ii*) No funds are utilised out of this grant for carrying out construction works to provide accommodation for residential purposes including visiting scientists & Research fellows.

1960(Ai) LS—4.

1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
2	Indian Science Congress Association, Calcutta.	1,63 690	..	1,72,177	..
		..	50,000	—	20,000
3	Indian Association for the Cultivation of Science, Calcutta.	6,28,000	..	6,44,500	
		..	2,10,000	..	30,000
		..	1,50,000	..	25,000
		*40,309	..	*14,280	

7	8	9	10
Rs.	Rs.		
2,11,000		For expenditure on establishment, travelling allowance etc. and for meeting expenses in connection with the Indian Science Congress Session which is held annually.	Accounts of the Assoiation will be open to test check by the Comptroller and Auditor General of India at his discretion.
	30,000	For construction of its building.	No condition was attached to the grant.
	5,000	For meeting expenditure on the return journey of Dr. B.N. Prasad who attended the 120th Annual meeting of the British Association for the Advancement of Science in 1958.	Do.
..	8,308	Payment made to Air India International for return air passage of Dr. E.W.R. Staecie of Canada, to attend the Indian Science Congress Session in Jan. 1959.	Do.
6,80,000		For meeting day-to-day expenditure on establishment, travelling allowance etc. for the regular activities of the Association.	Accounts of the Association will be open to test-check by the Comptroller and Auditor General of India at his discretion.
..	1,81,246	For land and building.	No condition was attached to the grant.
	1,88,654	For purchase of equipment and Library books.	Do.
*27,378		*Scholarship grant.	Do.

1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
4	Bose Institute, Calcutta.	4,00,000	..	3,50,000	..
			2,00,000	..	2,00,000
		*12,666	..	*7,273	..
5	Birbal Sahni Institute of Palaeobotany, Lucknow.	1,74,052	..	1,89,000	..
			**79,195	@25,000	..
				‡20,000	
		3,969		8,543	..

7	8	9	10
Rs.	Rs.		
5,00,000	..	For meeting day-to-day expenditure on establishment and travelling allwance etc. for the regular activities of the Institute.	Accounts of the Institute will be open to test check by the Comptroller and Auditor General of India, at his discretion.
..	1,47,000	For construction of buildings and purchase of equipment.	Do.
*6,073	1,00,000	For the celebration of the Centenary of Acharya J. C. Bose.	Do.
		*Scholarship grant.	
2,13,000		For meeting day-to-day expenditure on establishment, travelling allowance excursion and visiting scientists etc. for the regular activities of the Institute.	Accounts of the Institute will be open to test check by the Comptroller and Auditor General of India at his discretion.
..	†23,170	**For expenditure on equipment, Museum, Library, Maps and Furniture.	No conditions were attached.
	@10,000	@For renovation of the old building of the Institute.	Do.
5,725		Scholarship grant	Do.
		‡For construction of herbarium Block and a road.	Do.
		†For purchase of equipment.	Do.

1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
6	Indian Academy of Science, Bangalore.	70,000	..	74,000	
		..	75,000		55,860
		18,000	..	17,500	..
7	Himalayan Mountaineering Institute, Darjeeling.	55,667	..	20,000	..
		..	94,000	..	..
8	Entomological Society of India.		2,000	..	2,000
9	Royal Society and Nuffield Bursaries Committee, London.		5,333	..	5,333
10	Current Science Association, Bangalore.		5,000	..	4,000
11	Indian Mathematical Society, Madras.		2,000	..	4,000

7	8	9	10
Rs	Rs.		
76,000	..	For expenditure on establishment etc. in connection with National Research Prof. of Physics.	No conditions were attached.
..	40,000	For purchase of equipment.	Do.
23,000	..	For publication of the journal "Proceedings" of the Academy.	Do.
37,000	..	For meeting expenditure on day-to-day activities of the Institute.	Do.
..	21,000	For construction of the building of the Institute and purchase of furniture.	The Govt. of West Bengal would make sure that the construction was essential and that the rates would be reasonable and according to the schedule of rates and that the work will be done through the agency of the P.W.D.
..		For publication of the journal of the Society.	No conditions were attached.
	5,333	India's contribution to the funds of the Commonwealth Bursaries Scheme.	Do.
..	5,000	For publication of the Journal.	Do.
		Do.	Do.
..	7,500	For celebration of its Golden Jubilee and the publication of its Jubilee Volume.	Do.

1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
12	Physical Research Laboratory, Ahmedabad		40,000		*1,000 50,000
13	Bombay Natural History Society, Bombay.		4,000		10,000
14	Indian Chemical Society, Calcutta.	..	3,000		
15	Institution of Chemists (India), Calcutta.		2,000		2,000
16	India Science News Association, Calcutta.		10,000		5,000
17	Zoological Society of India, Calcutta.		2,000		
18	Indian Society of Theoretical Applied Mechanics, Kharagpur.		2,000		5,500
19	Indian Physical Society, Calcutta.	..	2,000		..
20	Calcutta Mathematical Society.		2,000		..
21	Mining, Geological and Metallurgical Instt. of India, Calcutta.	..	1,500	..	..
22	Geological Mining & Metallurgical Society of India, Calcutta.		2,500	..	3,000

7	8	9	10
Rs.	Rs.		
		For purchase of equipment.	No conditions were attached.
		*Local expenses for holding symposium on monsoons of the World.	Do.
		For construction of its building.	Do.
		For publication of the journal.	Do.
..	3,000	Do.	Do.
		Do.	Do.
..	20,000	Do.	Do.
..	1,000	Do.	Do.
..	3,000	Do.	Do.
	..	For purchase of equipment.	Do.
..	4,000	For the publication of their journal.	Do.
..	2,500	For bringing out a special commemoration Volume relating to Golden Jubilee Session Celebration.	Do.
		For the publication of the Institute's Golden Jubilee Commeoration Volume.	Do.
	3,000	For the publication of its journal.	Do.

1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
23	National Academy of Sciences, Allahabad.		5,000		25,000
24	Association of Scientific Workers of India, Kanpur.		..		6,000
25	Association of Indian Geographers, New Delhi.				2,000
26	Delhi University.				
27	Indian Society for Plant Physiology, New Delhi.			..	..
28	Indian Society of Soil Science, New Delhi.			..	
29	Maharashtra Association for the Cultivation of Science, Poona.				
30	Indian Institute of Chemical Engineers, Calcutta.				

7	8	9	10
Rs.	Rs.		
	5,000	For the publication of its joural.	No conditions were attached.
	10,000	For symposium on Chemistry of co-ordination compounds.	Do.
..	5,000	For publication of the Journal.	Do.
..	2,500	Do.	Do.
	50,000	For meeting local expenses in connection with Indian Science Congress Session held in Delhi in Jan., 1959.	Do.
	1,500	For publication of its Journal.	Do.
	500	For publication of its Journal.	Do.
	40,000	*Ad-hoc* grant for the development of the Institute.	Do.
..	3,000	For meeting expenditure in connection with sending a delegate to represent the Institution at the Golden Jubilee Celebrations of the American Institute of Chemical Engineers held in Philadelphia in June, 1958.	Do.

1	2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.
31	Society of Experimental Medical Science, Calcutta.				..
32	Bangiya Vijnan Parishad, Calcutta.			..	..
33	C.S.I.R.	2,25,00,000	50,00,000	2,10,00,000	50,00,000

7	8	9	10
Rs.	Rs.		
	1,500	For publication of its journal.	No conditions were attached.
	2,500	Do.	Do
2,90,00,000	1,50,00,000	For meeting their recurring and Capital Expenditure.	The grants to the C.S.I.R. are subject to the conditions indicated in G.F.R. Volume I except that provision of para 207(2) thereof has been relaxed in order to regularise the carry over of unspent balance to the next financial year. Accounts of the C.S.I.R. are audited by the Comptroller and Auditor General of India at his discretion.

APPENDIX III

(*Vide* para 20)

Procedure for sanctioning grants to scientific societies and institutes

In the month of August of every year, the scientific societies and institutes are requested to send their requirements for the next financial year. These requirements are received in September and are examined with reference to the revised budget estimates for the current year and actual payment of grants during the previous years. After scrutiny of the requirements of the various organisations they are referred to the Ministry of Finance through the Financial Adviser. Provision for these organisations is made for budgetary purposes only and actual payments of grants are made after detailed scrutiny of the expenditure during the previous year with reference to the audited statements of account and pace of expenditure during the particular year. In addition to the general procedure stated above, the proposals of the major institutes are discussed in a meeting held at New Delhi in the first fortnight of October at which the Secretary of the Ministry of S.R. and C.A., Financial Adviser to that Ministry or his nominee and Directors of the Institutes are present. After scrutiny of their proposals suitable recommendations are made to the Ministry of Finance for making provision in the budget for next year.

The general rules for the grants to the C.S.I.R. and private scientific research institutions are contained in GFR Vol. I, except that the provisions of para 207 (2) of those rules have been relaxed in order to permit the carry-over by them of the unspent balance to the next financial year. A statement showing the guiding principles for payment of grants-in-aid to private scientific research institutions is attached as Annexure.

In case of the C.S.I.R., grants are released in instalments according to their requirements in consulataton with the Financial Adviser and the Ministry of Finance, so that at no time large funds are allowed to lie with the Council. As regards grants to major private scientific research institutes, the recurring grants are paid in quarterly instalments keeping in view their financial position and the pace of expenditure during the current year. No-recurring grants for pruchase of equipment etc. are released on the basis of the delivery schedules and the payments to be made while those for buildings are released on the basis of progress of work. Advance payments may be made only to the limited extent of securing steel and cement.

As regards minor scientific societies, payments are made on receipt of the recommendations of the Council of the National Institute of Sciences of India and after verification of the financial position of the Society with reference to its audited statement of accounts for the previous year and the pace of expenditure for the particular year.

Annexure

Guiding principles for payment of grants-in-aid by the Govt. of India to Scientific Societies and Research Institutions

1. The Society/Institution should be of an all-India character and should be engaged in scientific activities of Scientific Research required in the general plan of scientific development.

2. The constitution of the Managing Body of the Society/Institution should be approved by the Govt. of India which shall have the right to nominate at least two representatives (one from the Ministry of Finance and the other from the Ministry of S.R. & C.A.) on it.

3. Where buildings are to be constructed with the aid of the Govt. of India, the plans and estimates thereof should receive their prior approval, and their officers shall have right of inspection of the work at every stage.

4. If grants for equipment are made, such equipment as is available in Government Surplus Stores should be obtained from the sources and no orders for supply of equipment should be placed elsewhere without first obtaining from the Director General of Disposals a certificate to the effect that he is unable to arrange supply of article in question.

5. The Society/Institution should exercise the utmost economy in their working, as also in respect of expenditure from the grants for buildings and equipment.

6. All expenditure to be met out of the grants shall be sanctioned by the Governing Body of the Society/Institution or other duly constituted body which ordinarily sanctions such expenditure or by the officers of the Society/Institution within the limits of specific authority delegated to them.

7. Grant under a particular head shall not be utilised for a purpose other than that for which it is intended except with the previous approval of the Govt. of India.

8. A copy of yearly statement of accounts of the Society/Institution duly audited and showing the amount spent for the purposes for which grants are made shall be furnished to the Govt. of India.

9. Where a grant has been given by the Govt. of India under specific conditions accepted by a Society/Institution, the Society/Institution shall, if it does not comply with these conditions, be liable to refund the grant already received, in such manner as may be required by the Govt. & any further grant shall be stopped.

10. Where the grant has been given to a Research Institute for Research Scholarships, the selection of the Research Scholars should be approved by the Govt. of India and quarterly progress reports of their work should be submitted to the Govt. for scrutiny.

11. There should be equal opportunity of employment for men and women of all States on the staff of the Society/Institution. Appointments should be made by a duly constituted Selection Committee appointed by the Management.

12. The scales of salaries of the staff of the Society/Institution should be on the basis approved by the Govt. of India.

APPENDIX IV

(*Vide* para 47)

Chart showing the Organisational set-up of the National Research Development Corporation of India

BOARD OF DIRECTORS

SECRETARY

SURVEY & STATISTICS SECTION	INDUSTRIAL LIAISON SECTION	ENGINEERING SECTION	TECHNICAL SECTION	ADMINISTRATION SECTION
STAFF	STAFF	STAFF	STAFF	STAFF
Research Officer . 1	Liaison Officer . . 1	Chemical Engineer . 1	Junior Technical Officer . . 1	Superintendent . . 1
Sr. Research Assts . 2	Stenographer . . 1	Asst. Chemical Engineer 1	Technical Asstt Hindi 1	Assistants . . . 2
Stenographer . . 1	Peon 1	Asstt. Mechanical Engineer. . 1	Typist (Hindi) . . 1	Accountant . . 1
Upper Division Clerk 1		Draftsman . . . 1	Peon . . . 1	Stenographer . . 1
Typist Clerk . . 1		Lower Division Clerk 1		Upper Division Clerks 2
Peon 1		Peon 1		Lower Division Clerks 4
				Daftry . . . 1
				Roneo Attendant . 1
				Peons . . . 3

APPENDIX V

(*Vide* para 49)

Objects of the National Research Development Corporation of India

The main objects of the NRDC, as laid down in its Memorandum of Association are :—

1. (*a*) To develop and exploit in the public interest for profit or otherwise :

(*a*) investigations, whether patentable or otherwise, of the Council of Scientific and Industrial Research, including technical and engineering know-how of processes ;

(*b*) patents and inventions of different departments of the Government of India and State Governments, commodity research committees, and other statutory research organizations, including technical and engineering know-how of processes;

(*c*) such other patents as may be voluntarily assigned, by general or special agreement, by universities, research institutions or individuals ; and

(*d*) such other processes and patents, the development of which may be entrusted to the Corporation by the Government of India ;

2. to enter into reciprocal arrangements with similar organizations in other countries to exploit Indian inventions in those countries and their inventions in India ;

3. to issue exlcusive and/or non-exclusive licenses on such terms and conditions regarding payment of premia, royalties, share of profits or any other basis as are considered advisable to commercially develop the invention and ensure commercial production of the products of inventions ;

4. to secure co-operation of such State-owned or State-controlled industries or any units thereof as are deemed or are likely to be interested or necessary to develop the new processes or inventions and reimburse such industries any loss that they may incur ;

5. to enter into agreement with a private firm or firms to develop inventions by trials at their works and to reimburse them any loss that may be incurred during these trials ;

6. to instal and work pilot, prototype or semiscale units or full commercial plants to develop a particular invention or inventions, to sell or otherwise dispose of the products of such inventions on payment or otherwise and generally on such terms and conditions as may be deemed fit ;

7. to transfer by sale, lease, hire, or otherwise dispose of any pilot plant, prototype plant, semi-scale plant or fully commercial plant to any firm, individual, association or institute and entrust the same with commercial production of any products of invention or inventions for which the plant or plants had been installed on such terms and conditions as may be deemed fit;

8. to afford facilities for advising and assisting Government departments, universities, research institutions and individuals in filing applications for patents and prosecuting the same before the Controller of Patents and to frame rules for the purpose and to vary them from time to time ;

9. to distribute a share of profits, premia and/or royalties from any particular invention or inventions to Government departments, institutions, organisations, universities, or individuals from whom such invention or inventions were received and to frame rules for the purpose and vary them from time to time ;

10. to reward, in special circumstances, any particular invention or inventions by gifts, rewards, *ex-gratia* payments or in such other manner as may be deemed fit.

APPENDIX VI

(*Vide* para 56)

List of Pilot Plant Projects sponsored by NRDC.

Name of Project	Objectives	Cost (Rs.)
1	2	3
1. De-ionisation of Cane Juice	Setting up a pilot plant to establish possibilities of introducing ion-exchange technique in sugar processing	2,65,000
2. Phthalic Anhydride from Tar Oils	Design and fabrication of pilot plant for fluidised bed oxidation of tar oils	2,00,000
3. Fluidised Bed Technique for Textile Processing	Design, fabrication and working of pilot plant.	3,56,000
4. Mechanical Bamboo Pulp	Establishing potentialities of increased yield of cheap paper from bamboo by a partially mechanical process. .	40,000
5. White Cement from Felspar.	Setting up and operating a pilot plant	50,000
6. Benzidene .	Extending laboratory results and collecting data for design of large scale plant.	Borne by Atul Products, Ltd.
7. Citric Acid .	Setting up and operation of a pilot plant.	Borne by Sarabhai Chemicals
8. Synthetic Pine Oil from Indian Turpentine	Collecting data for design and operation of a commercial Unit. .	6,000
9. Copper Chlorophyll .	To obtain data on process losses and recoveries	9,000
10. Baby Foods	Experimental production for consumer acceptability trials. .	10,000

1	2	3
11. Thermo Electric Generator	Fabrication of 12 proto-types for field trials	2,000
12. Paper from Wattle wood	establishment possibilities of use of wattle wood in paper manufacture	5,000
13. Cotton Seed Oil	Setting up and operation of a pilot plant	15,000
14. Phenylacetic Acid	Setting up and operation of a pilot plant.	Borne by Tata Chemicals Ltd., Mithapur.

APPENDIX VII

(*Vide* para 58)

Statement showing the positon of patents and processes referred to the Corporation as on 31-8-59

(1)	Processes licensed and in production	32
(2)	Processes licensed but not yet in production	40
(3)	Processes in respect of which licences have expired	3
(4)	Processes for which licences are under negotiation	10
(5)	Processes released to industry free of royalties or for which technical details have been published	71
(6)	Processes abandoned	100
(7)	Processes which are being worked by departments	2
(8)	Processes for which developmental action has been arranged with Firms	9
(9)	Processes for which projects for large-scale pilot plant trials were set up by N.R.D.C.	11
(10)	Processes for which Non-Technical Notes and Circular letters have been issued.	39
(11)	Processes on trial by related industries/departments	8
(12)	Processes on which pilot plant trials are being conducted or contemplated by laboratories	18
(13)	Processes under detailed examination	80
(14)	Processes which have been reported in a preliminary stage.	107

APPENDIX VIII

(*Vide* para 58)

List of Processes licenced by the N.R.D.C. showing also the processes in Commercial Production

Laboratory	Name of the Process	Date of preliminary reference to N.R.D.C.	Date of receipt of NTN & other details from the Laboratory	Effective date of agreement	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
Central Fuel Research Institute, Jealgora.	*Lisasorb (53607)	February, 55	February, 55	1-10-57	
	*Carbiuons (47446)	February, 54	February, 54	1-1-55	
	New Desiccants and Dehumidifiers (54264) . .	May, 55	May, 55	1-6-57	
	Resin from Tar Oil Fractions (56581) . . .	March, 56	May, 57	1-10-59	
Central Building Research Institute, Roorkee.	*Brick and Block Making Mechine (55602)	December, 55	September, 56	1-4-58	
	*New Foaming Agents for production of Low Density Foamed Concrete (58909)	July, 57	July, 57	1-4-58	
	Precast Doubly Curved Shell (61645) . . .	February, 58	February, 59	1-4-59	
	Portable Under Reaming Tool (54907) . . .	July, 55	June, 57	1-10-59	

(1)	(2)	(3)	(4)	(5)	(6)
Central Glass and Ceramic Research Institute, Calcutta.	*Mica Insulating Bricks (43607)	June, 54	August, 54	1-4-56	
	*Vitreous Enamels for Wire Wound Resistors (48419, 4925 and 52111)	August, 54	August, 54	1-10-55	
	*Chemical Porcelain	August, 53	September, 53	1-10-56	
	Foam Glass (49524)	November, 54	August, 56	1-10-58	
	Boron Free Enamels (54394 & 49555)	April, 55	April, 55	1-4-59	
	Copper Enamels (54433)	..	..	1-4-59	
	Wet Ground Mica (55454)	..	..	1-4-59	
Central Food Technological Research Institute, Mysore.	Malted Milk and allied Products (46995)	..	December, 54	April, 58	
	Infant Food	February, 56	September, 56	October, 58	
	Fruit Juice Power (49590)	July, 53	September, 54	April, 58	
	Groundnut Milk Curds (47902)	January, 54	July, 54	August, 58	Licence determined.
C.S.I.R. Schemes	*Manufacture of Bhilawan Stoving Enamels and Allied Products (28002 to 28005 and 29958)	Old Licence of C.S.I.R.	..	August, 45	

	Thermo-Couple Ammeters	Do.		First agreement Renewed in April, 57.	January, 54
	Ethylene Dichloride (51958 and 56935) . . .	May, 54	January, 55	January, 56	
	Ethyle Ether (49836)	January, 55	June, 55	October, 58	
	C.M.C. (Technical Grade)	December, 57	March, 58	October, 58	
	Pristimerin and Dulcitol (40968, 40969 and 40970)	Old licence of CSIR	..	August, 53	Licenced by CSIR and has now expired.
Indian Agricultural Research Institute, New Delhi . .	Pine Oil (48429) . . .	September, 54	June, 56	October, 58	
Jadavpur University, Calcutta .	Enrichment of Low Grade Graphite (44739) . .	September, 54	March, 57	April, 58	
National Physical Laboratory, New Delhi.	*Carbon Slabs & Rods	Old Licence		11-1-54	Licences issued by C.S.I.R.
	*Solar Cooker (46981)	Do.		11-12-52	
	Silver Mica Capacitors (53528) . .	July, 53	May, 56 .	1-10-57	
	Duplicating, Printing and Allied Black Inks (40257) .	March, 57	November, 57	1-10-58	
	Sealing Device for container (58382) .	September, 56	February, 59	1-10-59	
National Chemical Laboratory, Poona.	Nicotine Sulphate from Tobacco or Tobacco Wastes (45666 & 54867) . .	..	March, 53	October, 54	
	Liquid Rubber (60555) .	January, 58	..	October, 58	
	Can Sealing Composition (66194) . .	August, 58	September, 58	October, 59 .	

(1)	(2)	(3)	(4)	(5)	(6)
	Pressure Sensitive Transparent Adhesive Tapes (66803 & 67490)	September, 54	February, 59	October, 59	
	Metallic Salts of Polymerised Fetty Acids (43164)		March, 53	January, 55	Since determined.
	Emulsifying Composition for D.D.T. (43292)	..	November, 51	July, 54	Do.
Central Food Technological Research Institute, Mysore —*contd.*	*Ginger Cocktail	December, 53	..	April, 55	
	*Tonic Wine	Do.	..	January, 59	
	*Composite Protein Food (47580)		March, 53	First Licence effective from July, 54 which has been determined. Fresh licence effective from April, 58.	
	Improving the Storage life of Cashew Kernels (49838 & 53319)	January, 55	June, 56	October, 57	
Forest Research Institute, Dehradun.	Building Boards from Saw Dust & Other Wood Wastes (47411).	July, 54	February, 58	April, 59	
	*Bamboo Boards (42228)	Licence issued by Patent Advisory Committee.		October, 53.	
Central Electro-Chemical Research Institute, Karaikudi.	Electrolytic Cuprous Oxide (52394 & 56532)	August, 54	August, 56	October, 57	
Regional Research Laboratory, Hyderabad-Dn.	Dehydrated Castor Oil (46457 and 55423)	October, 54	October, 57	October, 58	
National Metallurgical Laboratory, Jamshedpur.	Graphite Crucibles (Carbon Bonded, (58669)	December, 57	April, 58	October, 58	

	Mullite Refractories from Kyanite (58553)	December, 56	July, 58	October, 59
Shri Ram Institute for Industrial Research, Delhi.	Plastipeel	November, 57	April, 58	October, 58
	Electrical Heating Mantle	November, 57	December, 57	October, 58
	Mineral Wool (44382)	January, 57	April, 57	October, 58
	*Shrifirset I & II (52325)	January, 57	May, 58	October, 58
	*Shrifirset UF	April, 57	May, 58	October, 58
	*Stabaca 101 (6055B)	December, 57	May, 58	October, 58
C.S.I.R. Schemes & Shri Ram Institute for Industrial Research, Delhi.	*Shrifirset III		May, 58	October, 58
	*Shrifirset V (65282)	..	May, 58	October, 58
	*An improved process for the production of Shrink & Crease proof finishes on Cellulose Textiles (59835)	..	May, 58	October, 58
Indian Council of Agricultural Research, New Delhi.	Stabaca 102 (62939) Fatliquor (62348 & 62566)	May, 57	April, 57	April, 59

Processes
[*in commercial production]

APPENDIX IX

(*Vide* para 91)

Statement showing the number of applicants for admission and the number of students actually admitted State-wise during the last three years in the Indian School of Mines & Applied Geology, Dhanbad.

State	1957-58		1958-59		1959-60	
	No. of applicants	No. admitted	Number of applicants	No. admitted	No. of applicants	Number offered admission
1. Bihar	589	38	895	38	1,430	48
2. Bengal	293	9	290	14	541	24
3. U.P.	520	37	668	24	841	14
4. Punjab	229	23	260	22	266	13
5. Orissa	89	4	152	5	151	11
6. Delhi	93	8	131	11	277	15
7. Bombay	124	7	142	11	120	9
8. Rajasthan	75	4	86	4	123	6
9. Madras	54	1	35	3	41	2
10. Andhra Pradesh	59	1	70	1	63	1
11. Madhya Pradesh	49	2	66	3	52	2
12. Kerala	13		21	..	24	3
13. Mysore	26	2	28	..	18	1
14. Travancore Cochin	13	..		..	..	
15. Jammu & Kashmir	9	..	13	..	12	
16. Assam	13	..	15		34	1
17. Tripura	3	2	1	..	5	..

State	1957-58		1958-59		1959-60	
	No. of applicants	No. admitted	Number of applicants	No. admitted	No.of applicants	Number offered admission
18. Himachal Pradesh	3	1	14		9	
19. Goa	1				2	
20. Nepal					3	
21. Manipur .						
22. East Africa	1					
23. Saurashtra			1			
24. Rajasthan .	1	1				
	2,257	140(*a*)	2,888	136	4,012	150(*b*)

(*a*) This year some candidates were also admitted direct to the Second Year Applied Geology course on the strength of their being B.Sc. graduates in Geology. A list of such students is also enclosed.

(*b*) The figure is provisional.

Number of students who actually took admission direct to the 2nd Year Geology Course

State	Session 1957-58
A.P.	3
Bombay	5
Kerala	2
Orissa	1
Rajasthan	3
U.P.	2
Bihar	1
Madras	2
	19

APPENDIX X

(*Vide* para 99)

Statement showing the strength of staff (Category-wise) in position in the Indian Institute of Technology, Kharagpur during each of the last 3 years.

Sl. No.	Designation of post	1956-57	1957-58	1958-59
1	2	3	4	5
1	Director	1	1	1
2	Dy. Director		1	1
3	Registrar	1	1	1
4	Professor in senior scale	6	5	4
5	Professor	9	14	13
6	Assistant Professor	39	52	55
7	Lecturer	56	79	86
8	Senior Scientific Officer	1	1	1
9	Librarian	1	1	1
10	Workshops Superintendent	1	1	1
11	Assistant Registrar	1	2	2
12	Accounts Officer	1	1	1
13	Audit Officer			
14	Stores Officer	1	1	1
15	Chief Medical Officer			
16	Medical Officer	1	1	1
17	Officer on Special Duty		1	1
18	Farm Superintendent		1	1
19	House Surgeon-*cum*-Pathologist		1	1

1	2	3	4	5
20	Institute Engineer			1
21	Assistant Engineer		1	2
22	Senior Research Assistant	12	22	18
23	Junior Research Assistant/Technical Assistant	35	37	39
24	Instructor	12	7	9
25	Assistant Lecturer	60	69	76
26	Physical Training Instructor	6	5	8
27	Security Officer		1	1
28	Superintendent	1	3	3
29	Accountant	1	1	1
30	Store Accountant	1	1	1
31	Assistant Accountant		1	1
32	Accountant Estate	1	1	1
33	Auditor	1	2	2
34	Assistant	5	8	8
35	Stenographer	6	6	6
36	Upper Division Clerk	26	38	39
37	Lower Division Clerk	70	77	79
38	Cashier	1	1	1
39	Junior Cashier	4	4	4
40	Chief Store Keeper	1	1	1
41	Store Keeper	9	8	8
42	Stock Verifier	1	1	1
43	Steward	1	1	1
44	Receptionist	1	1	1
45	P. A. to Director	1	1	1

1	2	3	4	5
46	Secretary	..	..	..
47	Assistant Librarian	3	3	3
48	Overseer (Farm)	2	2	2
49	Horticulture Assistant	1	1	1
50	Overseer	..		6
51	Sanitary Inspector			1
52	Caretaker			1
53	Foreman	16	13	13
54	Mechanic Grade 'A'	45	56	58
55	Mechanic Grade 'B'	49	46	45
56	Mechanic Grade 'C'	41	44	38
57	Draughtsman	10	12	10
58	Modelling Assistant	1		..
59	Supervisor (Workshops)	5	7	7
60	Erection Engineer			
61	Chemical Engineer	2	1	1
62	Mess Supervisor	1		..
63	Compounder	2	2	2
64	Lorry Driver	7	7	6
65	Warden		6	6
66	Assistant Warden		12	12
67	Eye Specialist (Part time)	1	1	1
68	Dentist (Part time)	1	1	1
69	Gestetner Operator Grade I	1	1	1
70	Gestetner Operator Grade II	1	2	2
71	Library Attendant Grade I	9	9	8
72	Library Attendant	5	6	6
73	Laboratory/Shop/Store Attendant Grade I Grade II.	125	129	132
74	Daftry	4	6	6

1	2	3	4	5
75	Peon	27	27	29
76	Chowkidar . . .	18	19	19
77	Jamadar	1	1	1
78	Durwan	20	22	2
79	Armed Guard . . .	2	2	22
80	Time Keeper . . .	1	1	1
81	Guard	7	7	7
82	Mali	19	20	20
83	Mazdoor	6	6	6
84	Beatsman . . .	27	34	34
85	Cleaner	1	1	1
86	Laskar	2	2	2
87	Sewerman . . .	..	..	..
88	Sweeper	43	45	46

APPENDIX XI

(*Vide* para 100)

Statement showing the sanctioned quota for each post-graduate course in the Indian Institute of Technology, Kharagpur and the number of scholarships offered during the last three years

Subject	Sanctioned quota	Scholarships offered		
		1956	1957	1958
1	2	3	4	5
Applied Botany	4	1	1	1
Farm Power & Machinery	4		1	2
Soil & Water Conservation	4			3
Technical Gas Reaction and High Pressure technology	8	2	2	3
High Polymer & Rubber Technology	8			1
Synthetic Drugs & Fine Chemicals	8			2
Regional Planning (Degree & Diploma)	4+4	1	2+1 (Renewal)	3+2 (Renewal)
Combustion Engg. & Fuel Economy	8	3	4	5
Chemical Plant Design & Fabrication	8		4	7
Harbour Engineering	8			
Highway Engineering	6	1		4
Municipal Engineering	6			1
Soil Mechanics & Foundation Engg.	6			3
Structural Engg.	8	7	3	5
Water Power & Dam Construction	8	3	2	4
Electrical Machine Design	8	3	3	5

1	2	3	4	5
Control System Engineering	8			4
Industrial Electronics	4			2
Radio Broadcast Engineering	4	3	2	3
Ultra High Frequency and Microwave Engg.	4	..	2	2
Applied Geology	4	2+1 (Renewal)	2+2 (Renewal)	2+2 (Renewal)
Exploration Geophysics	4	3+2 (Renewal)	1+3 (Renewal)	2+2 (Renewal)
Geochemistry	4	..		1
Non Linear Mechanics	6		1	3
Foundry Engineering	20			6
Industrial Engineering	8	3	3	7
Machine Design	4	1	2	1
Mechanical Handling	8			3
Production Engineering	8	2	4	8
Refrigeration & Airconditioning	4		1	2
I.C. Engine & Gas Turbine	8	2		2
Ferrous Metallurgy	8			..
Industrial Physics	4	1		2
Meteorology	4	1	1	2
Industrial Phycology & Industrial Physics	4			2

APPENDIX XII

Summary of Conclusions/Recommendations

Sl. No.	Reference to Para No.	Summary of conclusions/recommendations
1	2	3
1	6	While it is a fact that the number of receipts dealt with by different sections of the S.R. Wing has steadily increased during the period 1956 to 1958, the Committee are not sure whether the creation of one additional section fully justifies the creation of two additional posts of Under Secretaries. The Committee suggest that the special Reorganisation Unit should examine the feasibility of reducing the number of Under Secretaries in the Wing from four to three by suitable rationalisation and reallocation of work.
2	8	The Committee consider that there is scope for economy in regard to "Pay and allowances of Officers" and "T.A. to Officers and Staff". ~~and recommend that~~ The matter may be examined with a view to bring down the expenditure under these two heads to a reasonable level.
3	17	The Committee recommend that (*i*) the Scientific Liaison Officer should be appointed quickly so that the Indian Scientific Liaison Office, London may function efficiently and (*ii*) the post of the Senior Scientific Officer may be kept in abeyance.
4	18	The Committee are of the view that the Ministry should, in the first instance, see to it that the Indian Scientific Liaison Office, London functions effectively within its existing jurisdiction and then only should the question of extending its jurisdiction to cover other advanced countries in Europe may be examined.
5	21	The Committee consider that the increase subsequently made over the original provision for the development of scientific societies and institutes in the first Plan was unrealistic and unduly high.
6	25	A saving of Rs. 23 lakhs is anticipated in the Second Plan provision of Rs. 200 lakhs for the development

1	2	3
		of scientific societies and institutes. The Committee suggest that the amount may be surrendered well in time so that, if necessary, it may be allocated to other plan items in need of additional grants.
7	26	The Committee consider that the scientific societies and institutes have an important role to play in the field of science including scientific research. They accordingly suggest that the Ministry's endeavour should be to build up a vigorous system of research both within and outside Government. With this end in view, the question of affording adequate assistance in suitable cases to existing scientific institutions for enlarging their activities or for undertaking new lines of activity and to new institutions with well defined objectives, should be sympathetically examined.
8	27	The question as to what control or supervision Government should exercise in the case of educational institutions in receipt of grants-in-aid has been dealt with by the Committee in their 24th Report (Second Lok Sabha). While reiterating the observations, the Committee feel that in the case of the grants-in-aid to scientific institutions they should be enabled to function in their own way so long as the grants-in-aid are employed for the purposes they are given. It is only when they do not conform to the conditions of the grants that Government may intervene.
9	29	The Committee would like to observe that before sanctioning a scheme of an aided institute, all the details should be gone into and there should be no unilateral modification during the course of its implementation. They are of the opinion that it could be desirable to permit some latitude to the major scientific institutes in the matter of implementation of the plan schemes for which finances have already been allocated.
10	30	Where a reviewing committee has found the work of an institute satisfactory, the Commitee are of the view that there would be advantage in assuring it a fixed annual grant over a period, say of 5 years which would enable it to plan its programme for that period.
11	31	The Committee recommend that the proposal to make 'on account' payments to scientific societies and institutes ranging from 1/12th to 1/6th of the total

1	2	3
		grant for the year, or a fixed sum, according to the merits of the case, should be implemented early to overcome the financial difficulties experienced by some of these institutes due to delays in payments of grants.
12	34	The Committee consider that in the case of major research institutes getting substantial grants-in-aid from the Government of India, it would be desirable to have a Committee at regular intervals of 5 years to review their work. The Committee feel that the institutes will welcome such a review periodically.
13	37	The Committee suggest that the request of the Birbal Sahni Institute of Palaeobotany for financial assistance for a joint expedition with a Japanese Botanist to Bhutan and Sikkim may be sympathetically considered and an early decision taken thereon.
14	38	The Committee recommend that the Ministry should endeavour to fill up the post of Director for the Birbal Sahni Institute at an early date as it has remained unfilled for long.
15	39	The Committee suggest that the feasibility of developing the Birbal Sahni Institute into an International Centre for Palaeobotanical research as also of providing assistance for inviting Palaeobotanists from other countries to work there may be examined.
16	44	The Committee suggest that the question of developing the National Institute of Sciences of India on the lines of the Royal Society of the U.K. may be considered by the Ministry.
17	45	The Committee recommend that the following schemes put forward by the National Institute of Sciences should be expeditiously examined :— (*i*) Institution of research professorships or readerships in various universities as done by the Royal Society of U.K.; (*ii*) Publication of the scientific works of eminent scientists in the country ; and (*iii*) Preparation of the History of Sciences of India. Apart from the solitary work on the History of Indian Chemistry by Dr. P. C. Ray, there is no authoritative publication setting out the history of sciences of India. Every advanced country has given priority to this subject. It is high time that the Ministry should act without

1	2	3
		delay, for it is bound to take a long time to complete the task. The Committee are of the view that this work should be given high priority.
18	54	The Committee were informed that the estimated figures of Rs. 7 lakhs for capital expenditure in the budget of the NRDC for 1959-60 as against the actuals of Rs. 2·58 lakhs in 1958-59 were not based on any forecasts of expenditure "reliable or otherwise". The Committee consider it doubtful whether even a moiety of the provision would be actually utilised. They suggest that some method may be devised to arrive at more realistic figures for inclusion in the budget estimates in future.
19	61	The Committee regret the time lag in the commercial exploitation of a process after its development. They recommend that the NRDC should take effective steps to reduce this time lag by fostering contacts, both formal and informal, between the scientists and engineers engaged in research and the enterpreneurs in industry who can appreciate the value and potentialities of researches in progress and who are inclined to take advantage of them. For this purpose, it should have on its staff technical personnel who can maintain close relationship with the heads of the research institutions as well as with the top management of the industry in the country.
20	62	The Corporation should obviously not feel that its task is over with the presentation of a process to the industry. The Committee are of the view that it should persuade the industry to take up production as quickly as possible and play a positive role in helping the industry to overcome delays, procedural and others, in the development and commercial exploitation of a process.
21	63	The Committee suggest that the scheme to set up institutes for designing and developing tools, precision instruments etc. in various regions under consideration of the Ministry of Commerce and Industry should be finalised early in consultation with the NRDC and the CSIR.
22	65	The Committee were surprised to learn from the representative of the Corporation that certain incomplete processes were reported prematurely to NRDC by the National Laboratories. The Committee have also referred to this in para 69 of their Seventy Sixth

1	2	3
		Report on the Ministry. They cannot over-emphasise the need for a careful scrutiny being exercised before processes are reported for commercial exploitation.
23	66	It is hardly necessary for the Committee to emphasise the importance of the role that the NRDC has to play in the scheme of things. The Committee are appreciative of the efforts that are being made by the NRDC to fulfil its objectives but, judging from the paramount need of the country to forge ahead in industrial expansion and of securing favourable balance of payments in foreign exchange, they cannot feel satisfied with the progress as revealed by the results. With the increasing outlay on research whose overall benefits can be assessed solely in terms of their utilisation in the field, the Committee would like the NRDC to energise its activities for the better fulfilment of its avowed objectives. While suggesting that the NRDC should pursue vigorously the development of all patents and processes, the Committee would like it to pay particular attention to those which may result in the saving of foreign exchange.
24	69	The Committee suggest that the NRDC should periodically review the position in regard to its income and expenditure and make efforts to see that it attains self-sufficiency at least by the end of the 3rd Plan period.
25	70	The Committee suggest that an early decision should be taken on the question of revising the ratio of apportionment of the income from premia and royalties between the NRDC and the research organisations and while so doing the objective of making the Corporation self-sufficient may be kept in view.
26	72	The Committee suggest that the question of having a provision for incorporating the directives received from the President in the annual reports of the NRDC under Article 127 of the Articles of Association of the Corporation may be examined by the Ministry.
27	73	The Committee recommend that the Ministry should define the borrowing powers of the NRDC by placing a suitable limit thereto as in the U.K. This will enable Government to review the working of the Corporation at regular intervals as is done in the U.K. Such a financial review may assume greater importance in the years to come with the expansion of its activities.

1	2	3
28	74	The Committee suggest that the question of appointing a Committee to review the functioning of the NRDC may be examined by the Ministry.
29	77	The Committee suggest that the Director, Geological Survey of India should be included in the Governing Council of the Indian School of Mines and Applied Geology, Dhanbad.
30	78	The question of empowering the Governing Council of the Indian School of Mines and Applied Geology to accord administrative approval and expenditure sanction for works upto Rs. 10 lakhs in each case should be examined and an early decision arrived at as the Committee feel that this would accelerate the tempo of construction work.
31	80	The Committee suggest that the question of giving autonomous status to the Indian School of Mines and Applied Geology with power to award its own degrees may be examined by the Ministry.
32	81	The Committee find that the present name of the School is not appropriate. It appears to the Committee that the original name which was a simple one, would have served the purpose well as it would obviously not be possible with the increasing field of its activities to include in its name every subject taught in it. They, therefore, suggest that the question of suitably changing it may be examined.
33	84	The Committee are of the view that the intimation of expenditure sanction towards the fag end of the financial year and occurrence of huge shortfalls year after year in the budget of the Indian School of Mines and Applied Geology depict an unsatisfactory state of affairs calling for immediate remedial measures.
34	85	The Committee suggest that the post of the Principal in the Indian School of Mines and Applied Geology may be abolished.
35	88	The Committee are of the view that the re-organised plan of expansion of the Indian School of Mines and Applied Geology should be finalised and implemented without further delay so that the development plans of the institution may make a rapid headway failing which the implementation of the country's programme in the third plan is likely to be affected adversely for want of technical personnel.

1	2	3
36	89	The Committee recommend that efforts should be made to obtain endowments of chairs and research scholarships in the Indian School of Mines and Applied Geology from the Mining industry. The Committee trust that the public sector which occupies an important place in this industry will come forward with a generous measure of support to it and set an example for others to follow.
37	91	The Committee suggest that centres for the entrance examination of the Indian School of Mines and Applied Geology may be opened in the capitals of the States which do not have such centres.
38	92	The Committee further suggest that other things being equal, the question of giving some preference to the children of miners both in regard to admission and award of scholarships in the Indian School of Mines and Applied Geology may be considered.
39	93	The Committee suggest that the Ministry should take positive steps to encourage research work at the Indian School of Mines and Applied Geology and provide adequate facilities therefor.
40	94	The Committee recommend that the proposal to provide a coal mine to the Indian School of Mines and Applied Geology for training and research purposes may be examined *de novo*.
41	96	The Committee suggest that comparison may be made of the ratio of expenditure on administration to the total expenditure of the Indian Institute of Technology with that of similar scientific institutes in the country and abroad to see if the charges are unduly high and some reduction is possible.
42	98	The Committee suggest that the question of suitably improving the prospects for qualified and experienced personnel in the Indian Institute of Technology may be examined.
43	99	The strength of Class III and IV staff in the Indian Institute of Technology is on the high side. The Committee invite attention in this connection to the following recommendation made by them in para 12 of their 15th Report (Second Lok Sabha) :—
		"The Committee feel that the increase more especially in the category of 'other supporting staff' was disproportionate to the increase in the number of students.... In comparison with the standard

1	2	3
		laid down by the Sarkar Committee, the strength of staff in the Institute is excessive. The Committee suggest that the entire position should be carefully reviewed, so as to reduce the strength of staff to actual requirements or alternatively to increase the admission of students to the original figure contemplated by the Sarkar Committee so that *per capita* expenditure can be brought down."
		The Committee suggest that so far as Class III and IV staff is concerned, a job analysis of the work may be done with a view to effect economies.
44	101	In order to attract students of merit to the post-graduate courses in the Indian Institute of Technology, the Committee suggest that the scholarships may be offered on a larger scale, so that no such students are denied opportunities for higher studies on the mere ground of want of finance. The additional expenditure thereon will be well spent if it results in a greater number of qualified technologists specialising in their subjects for which facilities already exist. This would also ensure that the capacity of the Institute in various courses is fully utilised.
45	102	The Committee suggest that greater efforts should be made to secure endowment of chairs or institution of research fellowships in the Indian Institute of Technology as obtains in foreign technical institutions.
46	103	The Committee suggest that the wholesome practice of industrialists going to various institutions to see the work of final year students and making selections according to their requirements as introduced in Kharagpur may be encouraged in respect of other similar institutes in the country.
47	104	The Committee suggest that the results of studies undertaken by the Geophysics Department of the Indian Institute of Technology about the standard methods of locating underground water may be published.
48	105	The Committee suggest that a phased programme for the replacement of the outmoded and obsolete equipment may be drawn up and incorporated in the Third Plan.
49	115	The Committee recommend that the Indian Institute of Science, Bangalore should be assisted to take up further research in gas turbines work.

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50	117	The Committee suggest that an early start should be made in the setting up of the Central Instruments and Services Laboratory at the Indian Institute of Science as recommended by the Reviewing Committee.
51	120	The Committee suggest that the Ministry should impress upon the Indian Institute of Science the desirability of obtaining the prior concurrence of the Development Wing of the Ministry of Commerce and Industry before obtaining equipment under the gift programme so that the licence may be obtained by the time the equipment is received at the port. The Committee consider that by advanced planning the difficulties in procurement of foreign equipment may be minimised.
52	122	The Committee suggest that suitable steps should be taken to provide adequate residential accommodation to the staff in the proximity of the Institute as it would help in the creation of a proper atmosphere of study and research. A bolder plan should be drawn up in this regard in the Third Plan. The Committee, in this connection, reiterate the following recommendation made in para 79 of their Tenth Report (Second Lok Sabha) :— "The Committee are of the opinion that in the interest of educational advancement of the country, the teaching staff should be provided with suitable residential accommodation in the neighbourhood of the institutions concerned. The Committee have no doubt that the facility of residential accommodation will also tend to reduce the problem of the flight of technical personnel."

APPENDIX XIII

Analysis of recommendations contained in the Report.

I. CLASSIFICATION OF RECOMMENDATIONS

A. Recommendations for improving the organisation and working.

S. Nos. 3, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 24, 25, 26, 27, 28, 29, 30, 31, 33, 35, 36, 37, 38, 39, 40, 42, 44 45, 46, 47, 48, 49, 50, 51 and 52 *Total* : 44

B. Recommendations for effecting economy (including those for increasing income)

S. Nos. 1, 2, 34, 41 and 43 *Total* : 5

C. Miscellaneous recommendations.
S. Nos. 5, 6, and 32 *Total* : 3

II. ANALYSIS OF THE MORE IMPORTANT RECOMMENDATIONS DIREDTED TOWARDS ECONOMY.

S. No. as per summary of recommendations (Appendix XII)	Particulars.
1. . .	The feasibility of reducing the number of Under Secretaries in the S.R. Wing from four to three may be examined.
2. .	There is scope for economy in regard to 'Pay and allowances' of Officers' and 'T.A. to Officers and Staff'.
34. .	The post of the Principal in the Indian School of Mines and Applied Geology may be abolished.
41. . .	Comparision of the ratio of expenditure on administration to the total expenditure of the Indian Institute of technology, Kharagpur with a view to see whether reduction is possible.
43. .	A job analysis of the work of class III & IV staff in the Indian Intitute of Technology, Kharagpur with a view to effect economies.

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