

**CENTRAL BOARD OF IRRIGATION & POWER**  
**—a brief historical review—**

*by*

**P. H. Valdyanathan**

*Secretary*

## PREFACE

As the tempo in the execution of national plans is gaining momentum from year to year, it is inevitable that the various Governmental departments and other Organisations established in the country for the implementation of the plans should also continue to grow. The story of the Central Board of Irrigation and Power is one such. Starting with a membership of 10 in the year 1930, it has grown to a body comprising of 103 Members of the rank of Chief Engineer and above of the Centre and the States.

Since new Members are joining almost every year, it has become necessary to elucidate the objects and functions of the Board to all the Members from time to time. This small booklet has been written out with a view to accomplish this.

Much work has yet to be done in the field of irrigation and power development in the country. It is hoped that the Members of the Board and the profession in general will use this forum offered by the Board to advance knowledge and techniques suited to the Indian genius.

In the compilation of this booklet, I have to acknowledge with gratitude the hard work put in by Shri T. N. Taploo of this office.

P. H. VAIDYANATHAN

*Secretary,*

*Central Board of Irrigation & Power.*

NEW DELHI:  
*April 20, 1962.*

	PAGE
1. Irrigation Administration in the Pre-Independence Period . . . . .	1
2. Central Bureau of Information for Irrigation for India . . . . .	2
3. Formation of the Central Board of Irrigation . . . . .	3
4. Inauguration : First Session of the Board—A Landmark . . . . .	4
5. The Board—An Autonomous Body . . . . .	6
6. Membership opened to Princely States . . . . .	6
7. Formation of Central Research Station, Poona . . . . .	6
8. Formation of River Commissions . . . . .	10
9. Foreign Membership—Ceylon . . . . .	10
10. Formation of the Central Water & Power Commission . . . . .	11
11. Reorganisation of the Board and Library & Information Bureau . . . . .	15
12. Objects of the Library & Information Bureau . . . . .	18
13. Effect of Partition on the Board . . . . .	21
14. Change of name to Central Board of Irrigation & Power . . . . .	21
15. International Commission on Irrigation & Drainage . . . . .	22
16. International Engineering Conferences and the Exhibition—1951 . . . . .	22
17. Engineering Museum . . . . .	25
18. Silver Jubilee of the Central Board of Irrigation and Power . . . . .	26
19. Burma's discontinuance of the Membership of the Board . . . . .	27
20. 26th Research Committee Meeting of the Board—1956 . . . . .	28
21. Fundamental and Basic Research Studies . . . . .	28
22. Present activities of the Board . . . . .	32
23. Publications of the Board . . . . .	34
24. Collaboration with other Institutions . . . . .	35
25. Central Board of Irrigation and Power Gold Medal . . . . .	36
26. Office Building for the Central Board of Irrigation and Power . . . . .	38
27. Conclusion . . . . .	38
28. Presidents of the Board . . . . .	39
29. Secretaries of the Board . . . . .	39
Constitution of the Board as at present . . . . .	41
Appendix I . . . . .	57
Appendix II . . . . .	61

# **CENTRAL BOARD OF IRRIGATION & POWER**

## **—A Brief Historical Review—**

### **1. Irrigation Administration in the Pre-Independence Period**

Although the day to day administration of the Irrigation Departments, prior to the introduction of the Montagu-Chelmsford Reforms in 1920, was the responsibility of the Provincial Governments, all funds necessary for the construction and extension of major works were provided for by the Government of India, who in most cases also shared the revenues derived therefrom. The interest of the Central Government in respect of irrigation was usually reflected in their annual budget, which was conditioned by the success or failure of these projects in the Provinces. The situation changed with the introduction of Reforms in 1920. Irrigation became a completely Provincial subject and in most cases money for large projects was loaned to the Provinces by the Government of India on certain conditions.

In the early years after the Reforms, the Provincial Governments felt that the Government of India were dependent entirely on the advice of a single officer, who however able he might be, and might have spent most of his service in one Province only, would not be competent to deal with new irrigation projects from all over India, submitted for his examination, as conditions differed widely from region to region. This led the Government of India to seek the views of the Provincial Governments on the question of a suitable machinery designed, on the one hand to facilitate the exercise of control and on the other to afford the Provinces whatever help or expert advice which the latter might require.

The views of the Provinces were considered by the Government of India and the formation of a Board was one solution which if implemented would go a considerable way towards enabling the Government of India to exercise their powers of control when a major project was submitted for their consideration and sanction of the Secretary of State. The proposal was, that all the Provinces should co-operate and that all their Chief Engineers (Irrigation) together with the Consulting Engineer to the Government of India, should be regarded as Members of a Central Board. It would not, of course, be either necessary or practicable that projects submitted for sanction should be examined by the whole Board, but every project referred to the Government of India could be examined by a Sub-Committee of the Board, selected by the Government of India, which would ordinarily consist of two Chief Engineers possessing the widest experience of works akin to the problem under consideration together with the Consulting Engineer to the Government of India. Not only would projects, requiring under the rules to be submitted to the Government of India, be referred

to such a Sub-Committee of the Board, but it would be open to any Provincial Government to ask for a Sub-Committee to advise on any difficult technical question connected with irrigation project under preparation even though the project might not require under the rules to be submitted to the Government of India. Further, any dispute between two Provincial Governments or between a Provincial Government and an Indian State would ordinarily be referred to a Sub-Committee of the Board for decision on the technical points involved in the dispute.

This policy decision culminated in the formation of the **Central Board of Irrigation in 1927** by the Secretary of State, with a panel of members consisting of all the Provincial Chief Engineers and the Consulting Engineer to the Government of India from which at the request either of the Central or any Provincial Government, Sub-Committees were formed either to examine a particular project or to report on any specific question on which advice was required.

## **2. Central Bureau of Information for Irrigation for India**

At this stage the British Government was seized of the problem of improving agriculture in India. Consequently they sent a Royal Commission to India in 1927, who toured the country for about six months and submitted a report early in 1928. In paragraph 285 of the Report, the Commission recommended as under:

“We, therefore, propose the establishment of a Central Bureau of Information for Irrigation, the headquarters of which would be at Delhi and which might suitably be placed in charge of the Consulting Engineer to the Government of India. The main functions of the Bureau would be to establish and maintain a comprehensive Library of irrigation publications both Indian and foreign, which could be consulted by irrigation engineers so as to act as a clearing house of information needed by Provincial Officers. It should, however, be something more than a repository of information and a centre for answering enquiries. It should endeavour to reach a wider public than the Irrigation Departments and to keep agricultural officers and the public generally, in touch with irrigation development in India and abroad.”

Mr. D. G. Harris, C.I.E., Consulting Engineer to the Government of India toured the country sometime in June-July 1928 and discussed the issue with several Chief Engineers and found them unanimously in favour of the proposal. He recorded that “we are drifting towards a dangerous state of what I may call technical decentralisation and there is a real desire on the part of every officer whom I have come in contact, that the process should be checked”.

It was, however, doubted whether the establishment of a Bureau would, in itself, solve the problem. If the Bureau was to

be useful, it must be in much closer and more intimate touch with the Provinces than what was envisaged in the Report of the Royal Commission on Agriculture. What seemed to be required was a Bureau attached not to the Central Government but to the Central Irrigation Board, which in turn should be converted into an active Committee, somewhat on the lines of the Indian Railway Conference Association, and not regarded merely as a panel from which technical Sub-Committee could be drawn to report on specific questions. It was felt that the Provinces were apt to work too much in water-tight compartments with little knowledge of what was being done elsewhere in the country, with the result that work would be duplicated and labour often wasted in the consideration and solution of problems which might have already been considered and solved at other places. The Bureau had to bridge that gulf between the Provinces and the Centre.

### 3. Formation of the Central Board of Irrigation

It was in this context that the Central Board of Irrigation took its shape from a mere panel into an active Committee to meet at intervals, with the Bureau functioning as the Committee's office\*. Thus every Chief Engineer in the country was brought into close touch with each other and each one shared in the responsibility of the working of the Bureau.

The proposed Central Bureau of Information for Irrigation was attached to the Central Board of Irrigation. The main functions of the Bureau were the collection and dissemination of technical information from all sources both Indian and foreign likely to be of value to irrigation engineers in the country. It was recognised that the work of irrigation engineers was becoming more and more complex as the simpler projects had been completed and that the progress in future depended both on properly tackling the more difficult and complicated schemes and on the extension of existing schemes with greater efficiency in distribution and economy in the use of water. The Bureau was thus organised to constitute a meeting ground for research officers, through which views could be exchanged, difficulties solved and overlapping avoided. So, the Board and the Bureau were thus constituted as purely co-ordinating bodies designed to give each Province the benefit of experience gained elsewhere and to avoid committing the same mistakes done elsewhere. As then proposed, it consisted of the Central Board of Irrigation (comprising of all Provincial Chief Engineers and the Consulting Engineer to the Government of India) as the controlling and directing authority, a Central Research Committee (comprising of all Provincial Research Officers and the Consulting Engineer) to co-ordinate research and a Secretary, who would be also a Librarian functioning with a small office staff. The Central Board and the Research Committee would meet once a year. The meeting of the Provincial Research officers enabled personal contacts, to ensure proper co-ordination of their work and to exchange ideas on a wider scale than was possible by mere writing to each other. One of the main functions of the Committee was to draw up a brief report on the work done and the results obtained by its members and to make

---

\*Letter No. IR-72 dated 12th January, 1929 from the Department of Industries and Labour to Local Governments.

recommendations as to the steps to be taken for the future and as to the nature and distribution of the work, to be undertaken during the following year.

The duties and functions of the Board were defined as follows:—

- (i) To co-ordinate and guide research and bring about improvements in irrigation practice and methods of construction.
- (ii) To maintain a Library, collect and disseminate knowledge on irrigation and allied subjects.
- (iii) To establish contacts with institutions and individuals both in India and abroad, with a view to exchange of publications and information.
- (iv) To provide liaison between Provinces and maintain personal contacts between officers engaged on similar work.
- (v) To publish the results of research on irrigation and allied subjects.
- (vi) To contribute information on irrigation and allied subjects for publication in the press.

On January 12, 1929 the Department of Industries and Labour, Government of India approached the Provincial Governments about the Constitution of a Central Board of Irrigation with the above functions and the Standing Finance Committee was also approached to accord its approval. While approving the scheme, the Standing Finance Committee had suggested that "when a revision of the Constitution took place, an endeavour should be made to see whether Provincial Governments should not contribute towards the expenditure involved as they were also interested in the scheme".

#### 4. Inauguration: First Session of the Board—A Landmark

After protracted correspondence with the Provincial Chief Engineers, the First Meeting of the Central Board of Irrigation was convened at New Delhi on November 3 and 4, 1930 with members from the following Provinces present:—

Bombay  
 Bengal  
 United Provinces  
 Punjab  
 Burma  
 Bihar and Orissa  
 Central Provinces  
 Baluchistan  
 Government of India

Madras could not send its representative on account of a change over of the Chief Engineer.

While inaugurating the meeting, the Hon'ble Sir Joseph Bhole, K.C.I.E., I.C.S., Member of the Governor General's Executive Council said "I believe that this is the first occasion on which the Irrigation Chief Engineers in India have met together with a view to co-ordinating the work which is being done in the various Provinces and, as such, it seems likely to prove a landmark in the history of Irrigation administration in this country. The fact that so many Local Governments have, no doubt, at very considerable inconvenience to themselves, been able to spare the services of their Chief Engineers for this purpose is, I think, itself a clear indication of the extent to which they recognise its importance and it is also, if I may say so, a very definite sign of that spirit of co-operation, the fostering of which will be one of the primary functions of the Central Bureau of Irrigation which you are here to inaugurate ..... Its progress will be watched by the Government of India with the utmost interest; as an earnest of this interest they have already agreed to defray the whole cost of staffing and working the Bureau during this year and the next. It is, of course, impossible to say what rules will thereafter govern the financial relations between the Central and Provincial Governments ..... I have already referred to the question of liaison between the Provinces; it is here that in my opinion, the main value of the Bureau will lie and I trust sincerely that you will be able to discover means of rendering such liaison real and effective. This applies not only to liaison in respect of the constructional activities of the department, but also in respect of research. The work of the Irrigation Branch is undoubtedly becoming more and more complex as the simpler projects are completed, and progress in the future will depend both on the more difficult and complicated schemes being properly tackled and on the extension of existing schemes by greater efficiency in the distribution and economy in the use of water". He further went on to say that "no probable constitutional changes are likely to affect the result of your deliberations. There is no intention that either the Board or the Bureau shall in any way control or interfere with the actions of the Local Governments; it is purely a co-operative and co-ordinating scheme designed to give each Province the benefit of experience gained elsewhere and to prevent waste of money owing to work being done in two places where it need only be done in one. Whatever may be said for independence in other directions, technical isolation can never be anything but costly and dangerous".

Some decisions regarding the functions of the Board were taken in this first meeting. All the Chief Engineers present expressed the unanimous view that the formation of the Board and the Bureau constituted the most important advance which had been made in the administration of irrigation in this country since the appointment of the Indian Irrigation Commission in 1901.

The first Secretary to the Board was appointed and the first Executive Committee was elected. In the Board's first letter *vide* —No. 1 C.B.I. dated January 5, 1931, to the Secretary to the Government of India, Department of Industries and Labour, Public



Works Department, the Executive Committee requested the Government to move the Provincial Governments to defray the cost of the Board in proportion to the irrigation systems they had. In response to the wishes of the Executive Committee, the Government of India took up the matter with the Provincial Governments.

### 5. The Board—An Autonomous Body

In their letter No. IR-72 dated April 6, 1932, the Government of India, Department of Industries and Labour informed the Board that the Provincial Governments had agreed to subscribe towards the maintenance of the Central Bureau of Information for Irrigation and it had accordingly been decided that with effect from the commencement of the financial year 1932-33, the Bureau would be supported by subscriptions from the Provinces, the contribution of the Government of India being limited to Rs. 2,500 per annum. The Bureau would then pass from the direct control of the Government of India and be an independent body functioning under the direct control of the Central Board of Irrigation. The Government of India, who were deeply interested in the efficiency of the organisation have also decided that the Bureau should be allowed to continue in possession of certain facilities which it enjoyed then, namely rent free office accommodation in Simla and free stationery and printing.

The activities of the Board have been steadily enlarging ever since its formation and with its good progress and monumental publications relating to irrigation development, it gained world-wide recognition ere long.

### 6. Membership opened to Princely States

With its pioneering work in the formative years, the usefulness of the Board became evident all over the country. It was now felt that the Board's services could not be made available to the entire sub-continent if a section of the country *viz.*, the Princely States were not represented in the Board. The Board, therefore, resolved in 1943 to amend its Constitution to throw open its membership to individual engineers in charge of Irrigation Departments of Indian States also. Bahawalpur and Mysore were the first two Princely States to become members of the Central Board of Irrigation from 1944 which was until then confined to the Chief Engineers, P.W.D. (Irrigation Branch) of the Provinces of British India.

Immediately following this, many more Princely States joined the Board and on the eve of Independence all the major Princely States had become members of the Board.

### 7. Formation of Central Research Station, Poona

The Board at its Seventh Annual Meeting in 1936 passed the following resolution:—

“(A) This Board is of the opinion that in view of the fact that much of the work of a Central Station for Irrigation and Hydraulic Research would be of a fundamental

nature, such a station should be financed by the Government of India—particularly in view of the following facts:—

- (i) Irrigation is of all-India importance and large revenues accrue therefrom to the Central Government.
  - (ii) The Government of India at present make no contribution towards Irrigation research in India whereas they support to the extent of many *lakhs* of rupees Forestry, Agriculture, Veterinary research and Industries. To mention only two examples, the Forest Research Institute at Dehra-Dun and the Agricultural Research Institute at Pusa, have cost Government in 1933-34 Rs. 6.05 *lakhs* and 7.63 *lakhs* respectively.
  - (iii) The Provinces finance their own Irrigation research entirely and receive from the Central Government no contribution, such as is provided by them for research in other subjects.
  - (iv) Except for a small contribution from the Central Government in the form of office accommodation, printing and stationery and expenses in connection with the International Commission on Large Dams, the Provinces entirely maintain the Central Board of Irrigation, whereas the Imperial Council of Agricultural Research and other similar bodies are financed by the Government of India, though the subjects dealt with are definitely Provincial subjects, as is irrigation.
  - (v) Continuity of research and therefore stability of income are essential, and they should not be dependent on contributions and subscriptions from the Provinces. To ensure such continuity and stability to a Central Research Institute, adequate permanent maintenance by the Government of India is essential. The resources dependent upon contribution from the Provinces, States and other bodies are liable to fluctuate and under provincial autonomy, impossible to assess.
  - (vi) The Railways, and hence the Government of India, would derive considerable benefit from a Research Station dealing with River Training and Control.
- (B) A Central Research Station is essential for carrying out fundamental work on the following subjects:—
- (i) Tortuosity of rivers and their control in connection with the protection of railway bridges, embankments, canal headworks, towns and riverain lands *etc.*
  - (ii) The distribution, movement and control of silt at off-takes in connection with irrigation schemes.
  - (iii) Flow problems, starting from the relatively simple case of steady flow in a straight channel, and working up to

- highly complex conditions which arise when the discharge and silt charge vary and curvature and sinuosity are superimposed.
- (iv) Flow under weirs on permeable foundations.
  - (v) Flow of water over weirs and falls.
  - (vi) The protection of weirs.
  - (vii) Regime conditions in canals.
  - (viii) Seepage from canals.
  - (ix) Factors affecting rise and fall of water-table and stability of sub-soil water supplies, especially with reference to tube-wells.
  - (x) Factors affecting security of canal supplies, efficiency of distribution, outlets, modules and reduction of maintenance costs.

Out of these numbers (iv), (viii) and (ix) cannot be carried out at Khadakvasla as at present equipped, whereas all these subjects are being and can be investigated by the Station at Lahore after expansion to deal with large model experiments.

Other problems will arise from time to time as the pressure of demand on water supplies available increases.

- (C) The Research Stations at Khadakvasla and Lahore have been developed and staffed for the conduct of research on two different lines, i.e., the work at Khadakvasla has developed mainly on experimental hydro-dynamics while at Lahore it has developed on general lines of research in addition to hydro-dynamics, the latter, however, being conducted on a limited scale. Both these lines of research would have to be undertaken by a Central Research Institute. It follows that either Khadakvasla would have to be extended on the Lahore Plan or the Lahore Station must expand on the lines of Khadakvasla.

The approximate capital cost, including equipment of the Lahore Station is Rs. 10,00,000 and the recurring charges are Rs. 2,68,000. The capital cost of Khadakvasla is approximately Rs. 70,000 and the recurring charges at present are 1,02,000. If Lahore be selected as a Central Research Station the extra recurring cost would be Rs. 1,07,000 in the first year with a maximum cost of Rs. 2,20,000 whereas the immediate total recurring cost of Khadakvasla would be Rs. 1,39,000 with a maximum of Rs. 1,85,000.

The capital expenditure necessary to develop the Lahore Station would be about Rs. one lakh. It is not possible to state with any accuracy what the cost would be of suitably equipping Khadakvasla, but although it is evident that it would be very considerably in excess of the additional sum required for Lahore, it does not necessarily follow that it would amount to that already spent on the Lahore Institute which is more comprehensive than is visualised for the Central Station.

If the Government of India are prepared to face this expenditure, the Central Station should be situated at Khadakvasla as it has advantages over Lahore in that a large clear water supply is available for new models and the climate is equable.

If the financial aspect is to be considered, then the development of Lahore is the cheaper proposition.

The Station at Lahore would continue to be a Provincial one, while dealing with subjects of general importance in its capacity of agent to the Government of India.

(D) The Hydro-dynamic Experimental Station at Khadakvasla is worth retaining for the work which is at present being carried out, that is, for the speedy solution of specific practical problems presented to it, e.g., the Hardinge Bridge protection. The work to be carried out at Lahore, on the other hand, would be concerned not only with the solution of the particular problems presented but also with the elucidation of the fundamental theory embodying the results presented by the actual model experiment. Khadakvasla is, therefore, better suited for the speedy solution of practical problems by model experiments requiring large discharge but is not sufficiently equipped for the elucidation of fundamental theory, i.e., research as commonly understood.

(E) Whichever station be finally decided upon, the framing of programmes of fundamental research should be a function of the Central Board of Irrigation.

(F) With regard to the Government of India's question regarding provinces contributing towards the cost of financing a Central Research Station, it is impossible to say what attitude the new Provincial Governments will adopt, and at the moment the question of sharing the cost of the Station between the Central and Provincial Governments does not arise. However, could Provincial contributions be depended upon, a fair basis would appear to be that already adopted in respect of contributions to the Central Board of Irrigation. It may be noted that in view of the facilities already afforded to the rest of India by the Lahore Station, the Punjab Government would not be prepared to make any additional contribution.

(G) The Government of India have not favoured the Board with their reason for declining to finance the Central Research Station and in consequence, the Board has in considering the question, found itself considerably handicapped. At the same time the Board wishes to emphasise the reasons given above why the Central Research Station should be financed by the Central Authority."

The Board further discussed about the Central Research Station, at its Eighth Meeting held in 1937 and stressed the need for such a station.

On the above recommendation, the Government of India decided that the Station at Khadakvasla should be continued for another five years.

The Board at its Thirteenth Annual Meeting held on October 31, 1942 resolved that "The Members of the Central Board of Irrigation having had the opportunity of inspecting the Central Irrigation and Hydro-dynamic Research Station at Poona and being impressed with the very great value of the work being done by model experiments at the Station, the Board recommends that the Station should be made permanent in order to ensure the continuance of the work and the accumulation of data and experience".

In response to the above Resolution the Government of India decided to continue the Central Irrigation and Hydro-dynamic Research Station (now Central Water and Power Research Station) on a permanent basis.

#### **8. Formation of River Commissions**

With a view to control and regulate the supplies of the Inter-State rivers for optimum utilisation and to deal effectively with the problems in respect of irrigation, hydel power channel, flood control, soil conservation, drainage, navigation etc., the Board at its Fifteenth Annual Meeting held in November 1944 resolved that "The Government of India should be informed that the Board considers that the best way in which to ensure that the interests of all Provinces and States within a catchment basin shall receive due consideration, will be by the formation of River Commissions which will be organised as a result of an agreement between all parties concerned. The Board recommends that where conflicting interests are known to exist, Commissions should be formed with the least possible delay".

The formation of River Commissions had all along been urged and it is only now (1962) that the Government of India have been seized of the problem and have decided to set up River Boards for (1) Mahanadi, (2) Narmada, (3) Tapi, (4) Mahi, (5) Krishna-Godavari, (6) Sutlej, Beas and Ravi, (7) Yamuna, (8) Cauvery and (9) Ajoy river basins, for which the necessary Act has been passed by the Parliament.

#### **9. Foreign Membership (Ceylon)**

The Government of Ceylon approached the Board to enable their Chief Engineer to be a Member of the Board. The Constitution of the Board was duly amended to enable Ceylon also to become a Member of the Board from 1945.

## 10. Formation of the Central Water and Power Commission

The Board at its Eleventh Meeting held at Delhi from November 2 to 7, 1940 resolved as follows:—

“That the Board has considered the question of re-opening the post of Inspector General of Irrigation.

“Irrigation is a Provincial subject and if disputes arise with respect to the use, distribution or control of water, they are to be dealt with in accordance with Sections 130 to 133 of the Government of India Act 1935.

“The Board considers that the sources of natural supplies of water in the rivers affecting more than one Province or State should be under the control of a Central Authority in the Government of India, and this alone will facilitate the settlement of most of the disputes over water rights which are likely to arise between Provinces and States in the future.

“The Board considers that the Governor General can decide how to deal with such disputes only if he has at hand a Technical Adviser, who can give him the best advice.

“The Board suggests that the further functions of this officer would be:

- (a) to assume the post of President of the Central Board of Irrigation. The work of the Central Board of Irrigation is likely to further increase considerably with the admittance to membership of Chief Engineers of Indian States;
- (b) to act as an *ex-officio* member of any technical sub-committee formed by the Central Board of Irrigation to advise a Province or State which has referred a technical matter to it;
- (c) to be available if the Governor-General considers it advisable to include him on a Commission to be appointed under Section 131 of the Government of India Act 1935, for the purpose of dealing with complaints received from a Province or State; and
- (d) to represent Irrigation on the Council of the Board of Agriculture and Animal Husbandry, the Board of Forestry and other such bodies.

“The Board is unanimously of the opinion that the post of Inspector General of Irrigation should, therefore, be re-opened.”

A note by A.St.G. Lyster Esqr., Chief Engineer, Punjab Irrigation, on the need for an Inspector General of Irrigation or Consulting Engineer to the Government of India was put up to the Board at its Thirteenth Meeting held in 1942. The note is given below:—

- “1. The chief function of the previous Inspector General of Irrigation in India was to examine projects which were to be submitted to the Secretary of State for sanction

and to see that they were technically sound. It was absolutely necessary that this work should be done by an officer of high technical attainments, fully conversant with the conditions in different parts of India and the practice of irrigation in those places. Such a service could only be satisfactorily performed by an officer of long service in India and still resident in the country. In addition, such scrutiny was an important safeguard for the Government of India who in many cases were likely to be asked to assist in the financing of the projects. No one but an expert on the subject of irrigation could advise the Government of India as to the prospects of any individual projects as an investment for their money.

2. Of these two functions, the first has disappeared. Provinces are now free to embark on irrigation schemes as their judgement may guide them. There are still cases where a loan is desired from the Government of India but the safeguard has been discarded and there is now no one with the Government of India who can give expert opinion as to whether a project has been framed on sound and economical lines. In addition, the utilization of the rivers has made such progress that when a river passes from one Province to another there may be more than one claimant to the remaining available supplies, or the operation of a previously established scheme may be affected by the additional demands of a new scheme.
3. Under the present Government of India Act 1935, a Province or State may at any time proceed with the construction of any scheme subject only to the check that any interested Province or Federated State may make a complaint against such action and that the complaint may have to be answered before a Commission appointed by the Governor General (there is no provision for non-Federated States in the present Act). This arrangement would seem likely to engender disputes. It is the exact opposite of the system prevailing in England where the party who wishes to appropriate water must obtain sanction to do so from a Central Authority. In doing so he must first disclose his project in considerable detail and then defend it against any objection before a tribunal appointed for the purpose. Under the Government of India Act 1935, it is possible to visualise such situations as follows:—
  - (a) Of two States X and Y, X believes that Y is preparing a project likely to be harmful to him. Y's project is still in an incomplete state and Y may wish to retain scope for future modification. Y is, therefore, unwilling to give details. This unwillingness arouses X's suspicions and he puts in a complaint under the Act at a premature stage.
  - (b) An agreement exists between X and Y as to the amount of water each may withdraw at certain seasons. Y is

not certain that X is keeping strictly to the terms of the agreements. Y has no means of finding out unless X is willing to give facilities for inspection by Y's agents.

Other circumstances can be imagined, but enough has been said to show that the existence of a Central Authority would facilitate harmonious working and tend to reduce disputes. All enquiries as to what was being done or was intended to be done in a neighbouring State or Province would be made to the Consulting Engineer who would have authority to call for information and who would be in a position to satisfy himself as to facts.

4. It would be his duty to see that agreements and orders were faithfully observed. Failure in such matters is often the result of incorrect interpretation of the agreement and not of bad faith and the authoritative interpretation of irrigation agreements would be a special duty of the Consulting Engineer.
5. A very important duty which the Consulting Engineer should undertake is the supervision of the collection of discharge data. The work was started in the Indus Basin in 1922-23 as a result of a note by the then Inspector General of Irrigation who also brought into existence a Committee known as the Indus Discharge Committee which was to meet periodically and examine the data collected and draw inferences therefrom. This Committee last met in 1929. Its discontinuance seems to have been chiefly due to the abolition of the post of Consulting Engineer to the Government of India, there being no other suitable person to arrange for and preside over meetings. It would be the duty of the Consulting Engineer to revive this work not only for the Indus Basin but for other parts of India where the need for such detailed data has not, up to the present, been felt but may arise in the future. A sequence of at least 20 years is necessary for reliable conclusions to be drawn.
6. A new and important duty for which a Consulting Engineer is required, is to act as Adviser to the Governor General in the matter of complaints under Section 130 of the present Act. Such complaints are only to be referred to a Commission if it is of sufficient importance and their importance can only be accurately gauged by an officer with wide experience of irrigation work in India. Then too they should be examined to see that they are properly and fully prepared. A commission in session may be estimated to cost Rs. 40,000 per week, time spent on preparation costs much less and should result in an appreciable shortening of the expensive sessions. In this connection, a Consulting Engineer to the Government of India could be entrusted with the task of presiding over an Inter-Provincial Council such as is described



in Section 135 of the Act and might often succeed in finding a solution by mutual agreement without the need for a Commission.

7. When a Commission became necessary, the Consulting Engineer would be in a position to advise as to the most suitable persons to serve on it as technical members.
8. Certain aspects of irrigation engineering are coming to assume a more than provincial importance, for example River Training, Railfall and Run off; these would come under the direction and guidance of the Consulting Engineer as the need arose.
9. It may be argued that the creation of such a post as is suggested is an infringement of the pure principle of Provincial Autonomy. That is not the case. Under the present Act, a Province has absolute control over any stream which lies wholly in that Province, but where a stream passes from one Province to another, the Governor General has authority to settle disputes. The suggestion now made does not aim at any alteration of this. The intention is only to provide better machinery for the avoidance of disputes and for their settlement expeditiously and economically. The proposed duties may be summarised as follows:—
  - (i) To advise the Government of India on the soundness of a project when application has been made for a loan.
  - (ii) To act as an office of reference from which information as to the acts and intentions of another Province may be obtained.
  - (iii) To interpret agreements and orders and when necessary to ascertain that they are being faithfully observed.
  - (iv) To supervise and direct the collection of discharge and allied data and to call into existence and preside over Inter-Provincial Committees to consider the data so collected.
  - (v) To advise the Governor General as to the importance under Section 130. To see that such complaints are fully prepared. To preside over Inter-Provincial councils under Section 135.
  - (vi) To recommend persons suitable to serve on Commissions.
  - (vii) To direct and supervise the study of irrigation engineering problems of more than Provincial importance.
10. It is clear that an officer of outstanding abilities is required for these duties. In order to widen the choice as much as possible, it is suggested that officers of not more than 55 years of age should be appointed and might be allowed to hold the appointment for 5 years but in no case beyond the age of 60. It should be a disqualification for

further office under the Crown. The most suitable title would be Consulting Engineer for Irrigation to the Government of India. The term Inspector General suggests and is linked with the period of control by the Secretary of State."

The above note was discussed thoroughly and the Board urged the Government of India on the reappointment of the Consulting Engineer to the Government of India.

Again at the Fourteenth Annual Meeting in November 1943, the Board strongly urged the Government of India that in order to make the fullest and most economical use of waterways, one Central Technical Authority should exist who would assemble and collate the necessary data for the information and use of the Government of India and of the several Provinces and States concerned.

The Board at its Fifteenth Annual Meeting held in November 1944, noted with satisfaction that the Waterways Experimental Station had been made permanent and that the post of Consulting Engineer for Waterways had been sanctioned. The Board stressed upon the Government of India for urgent necessity of taking steps to fill the post and to provide the incumbent with an adequate staff to carry out his functions.

And it was with great jubilation that the Board learnt in 1945 that the Government of India had agreed to set up a Central Waterways, Irrigation and Navigation Commission composed of a Chairman, two permanent members and two or more part time members. The Commission was intended to deal with (i) Irrigation, (ii) Navigation, (iii) Waterways, (iv) Hydrology, (v) Designs, and (vi) Publications, Statistics and Information Bureau, each Section being under one Director.

So the Board in its Sixteenth Annual Meeting held at Delhi from November 26 to December 1, 1945 resolved that "The Board notes with gratification the acceptance by the Government of India of the recommendations that had been made for many years past regarding the revival of the post of Consulting Engineer to the Government of India".

The Central Waterways, Irrigation and Navigation Commission thereafter went through many changes and it is now named as Central Water and Power Commission, amalgamating the functions of the Central Electricity Commission also.

## **11. Reorganisation of the Board and Library and Information Bureau**

Mr. A. M. R. Montagu, Vice-President of the Board during 1945 (incidentally he was also the first Secretary of the Board) remarked:

1. The system of maintaining records in the Board's office is elementary: with the large increase in records it requires modifications.

2. The classification of books and journals received in the Library is very important and is falling behind. Additional assistance is required under this head.
3. The office and the library are badly congested.
4. The work of the Central Board of Irrigation Office and Bureau has increased very considerably. As a consequence the whole organisation suffers from congestion and gives an impression of lack of systematic disposal of business which I am sure is unjustified. I am left with the impression that one of two courses are open:—
  - (a) if funds permit, increase the staff and accommodation, to continue the various activities now undertaken, and.
  - (b) if funds do not permit of (a) then activities must be restricted.

The above remarks along with the Secretary's proposals were discussed in the Sixteenth Annual Meeting of the Board in 1945 when it

“Resolved that the Board is of considered opinion that there can be no curtailment in the activities originally undertaken by the Board in its first meeting held on November 3 & 4, 1930. The Board notes that with the limited funds at its disposal these functions have been considerably handicapped and for this reason and in view of the very large increase in the number of members of the Board, the growth of the Irrigation Departments of Provinces and States and the likelihood of undertaking large-scale construction work in the near future, it is necessary to find increased funds for efficiently carrying out these activities.....”

“After a detailed examination of the various possible alternatives for finding the additional sum required, the Board has come to the conclusion that the most equitable and the simplest method is for the Government of India to give an annual grant to the Board of a sum of Rs. one lakh in addition to the facilities the Government of India has been providing in the past. In view of the enlightened and liberal policy that the Government of India has adopted in recent years and in view of the very large benefits that the Government of India derive, both directly and indirectly, from irrigation and hydro-electric development in the country, this Board has every hope that this request will be acceded to.....”

“Resolved that the Sub-Committee comprising Messrs Khosla, Montagu, Hutchinson and the Secretary of the Board formed to examine the details of the proposed scheme of the reorganisation should wait in deputation on the Hon'ble Member for Labour and Finance and take such other steps as it deems necessary to urge the recommendations of the Board.....”

In response to the above Resolution, the Sub-Committee consisting of Messrs Khosla, Montagu, Hutchinson and the Secretary of the Board, Shri N. D. Gulhati waited on the Hon'ble Dr. B. R. Ambedkar, Member for Labour to the Government of India at 11-00 A.M. on February 23, 1946 when the Hon'ble Mr. H. C. Prior, Secretary, Labour Department and Mr. D. L. Mazumdar, Joint Secretary, Labour Department were also present.

The Hon'ble Member gave them a very patient hearing and said that there was no doubt that the Technical Library of the Central Board of Irrigation must be maintained in an efficient condition and that the request of the Board would receive consideration by the Government of India, but he could not give any assurance at the time.

The Government of India, Department of Works, Mines and Power, *vide*—their Letter No. DW 101(58) dated March 13, 1947, informed the Secretary of the Board that they had come to the conclusion that instead of making an additional grant of Rs. one *lakh* to the Board, the Government of India would assume full financial responsibility for maintaining the Library and the Information Bureau now being run by the Board. The Government proposed that the Library and the Information Bureau of the Board be treated as a part of the Central Waterways, Irrigation and Navigation Commission with effect from April 1, 1946. This arrangement would eliminate any possible duplication in respect of work in the Library and Information Bureau between the Board and the Central Waterways, Irrigation and Navigation Commission. Liaison and continuity would be maintained, for the present, by the Deputy Secretary of the Information Bureau working as part time for the Central Board of Irrigation and the Secretary Central Board of Irrigation directing the operations of the Information Bureau and Library under instructions of the Chairman, Central Waterways, Irrigation and Navigation Commission. The facilities now being offered by the Bureau to Provinces and States would not be curtailed in any respect. The arrangement proposed above would not in any way affect the annual contribution of Rs. 2,500 at present and other facilities provided to the Board by the Central Government *viz.*, free office accommodation and free stationery and printing for the Board's Office. The Consulting Engineer to the Government of India should be a permanent member of the Executive Committee of the Board and so long as the Secretary to the Board remained in-charge of the Information Bureau, the appointment of every new incumbent to the post would be subject to the approval of the Government of India.

The Board, *vide*—its Letter No. 1989/A.24 dated March 15, 1947 to the Government of India, Ministry of Works, Mines and Power, while accepting the proposal stressed that the Board would have liked that the Library and the Information Bureau had been left under its own control. However, the Board had decided to accept, for the time being, the proposal of the Government of India to treat the Library and Information Bureau as part of the Central Waterways, Irrigation and Navigation Commission.

Later on in 1956, for the efficient maintenance and expansion of the Library and Information Bureau, in consultation with the

Central Water and Power Commission, the Board formed a Library Advisory Committee consisting of (i) Chairman, Central Water and Power Commission, (ii) President or Vice-President of the Central Board of Irrigation and Power for the time being, (iii) Member (Designs and Research), Central Water and Power Commission, (iv) Member (Utilisation), Central Water and Power Commission and Secretary, Central Board of Irrigation and Power. The Secretary, Central Board of Irrigation and Power exercises general control over the Library. All matters pertaining to the Library and its staff are referred to the Secretary, Central Board of Irrigation and Power, who passes on the case with his comments to the Chairman, Central Water and Power Commission for disposal, as may be required.

## 12. Objects of the Library and Information Bureau

Unlike most Libraries, this Library and Information Bureau is not merely a lending Library but also an Information Bureau as it can supply information on any subject or problem, however, minute it may be, concerning irrigation, hydro-electric and allied subjects. The main objects of this Library and Information Bureau are:

- (a) To maintain a Library on Irrigation, Hydro-electric engineering and subjects allied to these.
- (b) To establish contacts with institutions and individuals in India and other countries engaged in Irrigation, Hydro-electric engineering and allied subjects with a view to exchange publications.
- (c) To collect and supply information on Irrigation and Power and also to disseminate the results of research on Irrigation and allied subjects.

The Library endeavours to obtain all useful literature on Irrigation, Hydro-electric engineering and allied subjects through various sources.

Contacts for the exchange of publications have been established with engineering organisations not only in India but also in about 40 other countries, namely Africa, Australia, Brazil, Borneo, Belgium, Canada, China, Ceylon, Czechoslovakia, Cyprus, Dominican Republic, Egypt, France, Germany, Hungary, Iran, Iraq, Italy, Japan, Malaya, Mexico, Nepal, New Zealand, Netherlands, Sudan, Sweden, Switzerland, Transjordan, U.A.R., United Kingdom, U.S.A., U.S.S.R. etc. The number of such contacts now in operation is 263. Due to the establishment of these exchange relations the Library is able to get quite a lot of current engineering literature free of cost and it also thus keeps itself informed of the latest engineering activities and technical development of other countries.

The literature received in the Library consists of (a) Books, (b) Periodicals, (c) Maps, Plans and Photographs, (d) Trade Catalogues and (e) Films.

### (a) Books:

The books include text books, Government reports, publications of official and non-official societies, type-written notes, pamphlets and

annuals. The books are obtained on all branches of engineering and other allied subjects, viz., irrigation, hydro-electric engineering, water-power, hydraulics, hydraulic engineering, navigation, soil mechanics, foundations, geology, climatology, mechanical engineering, rail and road engineering, concrete engineering, materials of construction, town planning, water supply, sewerage, agriculture, soil erosion and conservation, law, mathematics, surveying and architecture. The Library now contains about 63,300 books.

**(b) Periodicals:**

About 350 engineering and scientific periodicals are being regularly received from all parts of the world. At present there are about 59,545 individual issues of periodicals in the Library. These keep the Library posted up-to-date in various branches of engineering.

**(c) Maps, Plans and Photographs:**

There are about 3,354 maps and plans and over 5,399 photographs in the Library. This branch of the Library was started only in 1948 when it was realized that a specialised engineering library of this nature must maintain a well equipped set of maps, plans and photographs. The maps in this branch relate mostly to various States of India and some maps of other countries. Plans and photographs of all important major projects in the country are also available in the Library.

**(d) Trade Catalogues:**

The Library also obtains trade catalogues of engineering interest. These are useful not only in providing information about the manufactured products of various firms, but also about the various devices, processes etc., patented by firms which are of use to engineers. This section was started only in September 1949 and has 2,849 catalogues at present.

**(e) Films:**

The Library maintains a Films Section of still and motion pictures on various engineering and allied subjects. It possesses its own sound projector etc. This Section was started in 1951. There are at present 143 reels in the Library\*. Special shows are also arranged occasionally at which engineers interested on the subjects in the various departments are invited. Besides being very educative, these films give an idea of how the engineering problems on the different projects all over the world are being tackled. These reels are available on loan to Members of the Board free of cost.

## COLLECTION AND SUPPLY OF INFORMATION

In addition to the usual function of lending books, the Library and Information Bureau supplies literature on request to irrigation and hydro-electric engineers on any subject or problem, however, trivial or complex it may be. To fulfil this function, all literature (excluding maps, plans and photographs and films received in the

---

\*List given in the Appendix I.

Library) is abstracted and classified in great detail. The maps, plans etc., are merely classified but are not abstracted.

*(a) Abstracting:*

All books as well as such articles in journals and proceedings of Societies, Conferences etc., as are of use to irrigation and power engineers are abstracted. The work is done by qualified engineers. The abstracts are issued in the form of a monthly journal known as "Central Board of Irrigation and Power Abstracts". The entries are arranged according to certain broad subjects as per Universal Decimal Classification (U.D.C.). Over 2,000 copies of this publication are distributed monthly to various administrations who contribute or subscribe to the Central Board of Irrigation and Power and to various other National and International Institutions, with whom free exchange relations exist. This publication is very useful to the engineers as it enables them to keep a complete bibliography of literature on the subjects of interest to them and they can get on loan such publication or literature, dealing with their problems.

*(b) Supply of Information:*

When an enquiry is made by an applicant on any subject, the U.D.C. number or numbers relating to the subject of enquiry is/are traced out from the alphabetical subjects index maintained in the Library from U.D.C. books. The cards bearing those numbers are then referred to and the literature available is sorted out by the Librarian and the relevant portions are marked. These are then perused by the engineering staff of the Library and the literature giving answer to the point and the latest information, if any, on the subject is sent out to the enquirer. By this means, all the up-to-date knowledge on that subject is available to the enquirer. This saves much labour and time of the applicant in going through all the literature himself, which is not only time-consuming but also difficult. The applicant can then go through the literature supplied and use it for his problem. This information is supplied to all the irrigation and power engineers in India whose employers are Members of the Board, free of cost. Engineers are making increasing use of this service. The number of books lent is also increasing steadily every year.

## OTHER FUNCTIONS

*(a) Statfile and Microfilming Section:*

In addition to the above functions the Library maintains a Statfile and Microfilming Section. This was started in 1948 to enable preparation of copies from out-of-print or otherwise unavailable publications and also to prepare copies of various photographs. This Section also prepares copies from master plans in a very economical, accurate and rapid way of reproduction. The photographs can be enlarged or reduced. It undertakes work for other organisations on cost basis only. The Section is proving extremely useful.

By microfilming process rare books can be photographed in very small films. These small sized films can be sent to any part of the country where arrangements for reading the films exist.

**(b) Supply of Index Cards to other Organisations :**

The Library has in operation a scheme of supplying copies of Index Cards relating to available literature in the Library to other organisations. This service is done at very nominal charges. Already six Institutions are subscribing towards this scheme. By this they remain in touch with the literature available in this Library enabling them to indent for particular literature on this Library whenever required. The cards are supplied according to authors and subjects.

**WHO GETS THE BENEFITS AND HOW TO APPLY**

Loan of Books, answering of enquiries, supply of C.B.I.&P. Abstracts, supply of Index Cards, Statfiling and Microfilming and supply of Films and motion pictures are the facilities which are offered to (i) Members of the Central Board of Irrigation and Power who contribute or subscribe to the Board, (ii) the Central Water and Power Commission and its subordinate offices, (iii) organisations and institutions which have exchange relations with the Central Board of Irrigation and Power and (iv) in special cases to officers of other departments. All communications intended for availing the Library facilities are addressed to the Secretary, Central Board of Irrigation and Power, Curzon Road, New Delhi-1, who will take every step to answer such enquiries with utmost promptitude.

**13. Effect of Partition on the Board**

The partition of the country in 1947 had its repercussion on the Board also. The West Punjab, N.W.F.P. Sind, Baluchistan, East Bengal, Bahawalpur and Khairpur States which were parts of the composite India, withdrew their membership from the Board, since they formed part of the newly created Pakistan. Apart from the curtailment of its membership by their separation, the Board incidentally also suffered from a short-fall in her financial resources.

The Government of India was approached to give a special grant of Rs. 30,750 for three years in the first instance to balance the budget. Instead of an *ad hoc* grant of Rs. 30,750 for three years, the Government of India, Ministry of Works, Mines and Power *vide*—Letter No. DW 82/48 dated February 5, 1949 was pleased to decide that the annual contribution of the Government towards the upkeep of the Board be increased from Rs. 2,500 per annum to Rs. 17,500 per annum. The other facilities *i.e.*, free stationery and printing and free office accommodation remained unaffected.

**14. Change of name to Central Board of Irrigation and Power**

Just at this time the development of electric power was making headway in many Provinces and also the Princely States, and separate departments for Electricity were being created. As power and irrigation developments have much common ground to cover, it was felt that the Board could offer a common forum for their development. So from 1949, the Board was redesignated as the "Central Board of Irrigation and Power" and its membership was thrown open to Chief Engineers of Electricity also from the Provinces and the Centre, the Constitution of the Board having been amended to accommodate the change.



## 15. International Commission on Irrigation and Drainage

At the recommendation of the Central Board of Irrigation, the Government of India agreed in May 1948 to sponsor a proposal to invite the co-operation of all countries with a view to establish an International Commission on Irrigation and Canals (now International Commission on Irrigation and Drainage). The main functions of this organisation were to encourage progress in the design, construction, maintenance and operation of large and small irrigation works and canals, to bring together information thereon and to study all questions relating thereto. A number of countries responded favourably to the invitation issued by the Government of India and offered to co-operate in setting up the proposed Commission; others expressed their interest and liked to be kept informed of further developments. The need for international co-operation in the field of irrigation and drainage was universally accepted.

A meeting was called in June 1950 at Simla in India of the representatives of all countries who had offered to co-operate or had expressed interest in the work of the Commission. At this meeting, it was decided to set up the Commission and a tentative Constitution was drafted. Shri A. N. Khosla was elected as the first President and Shri N. D. Gulhati as the first Secretary General.

It was also decided to hold the first Congress in India in January 1951. At the second meeting of the International Executive Council, held in January 1951, a final Constitution for the Commission was adopted and it was renamed as "International Commission on Irrigation and Drainage".

At the moment, the Commission has 51 countries as its members and have issued a number of booklets on Irrigation and Drainage. It has held so far four plenary sessions in different parts of the world.

## 16. International Engineering Conferences and the Exhibition—1951

The history of the Board will be incomplete without a reference to the International Engineering Conferences and the Indian International Engineering Exhibition organised by the Board in 1951. Four International Engineering Conferences *viz.*, Fourth Congress of the International Commission on Large Dams; First Congress on Irrigation and Drainage; Fourth Conference of the International Association of Hydraulic Research and the Sectional Meeting of the World Power Conference were organised for the first time in this country. Considerable organisational effort, careful thought, enormous labour and heavy outlay were involved in the arrangements in connection with these International events. The Central and State Governments, private Institutions and Industries contributed liberally with funds and facilities. Individuals, both officials and non-officials rendered voluntary service with a missionary zeal. The Prime Minister in connection with his invitation to all the nations of the world to participate in these said "The activities of these

International Organisations are of the greatest importance to mankind especially at a time when all Nations of the world have launched upon projects to step up food production and power generation with a view to raising the standard of living of the people. Meetings of such bodies provide an excellent opportunity for the study and development of technique in the planning and execution of projects for the conservation and utilisation of natural resources by pooling the knowledge and experience of all Nations of the world for the ultimate benefit of the human race".

The Fourth Conference of the International Association of Hydraulic Research was held at Bombay from January 3 to 7, 1951 and the other three Conferences viz., Fourth Congress of the International Commission on Large Dams; First Congress of the International Commission on Irrigation and Drainage and the Sectional Meeting of the World Power Conference were held concurrently in the historic hall of Parliament House, New Delhi from January 11 to 16, 1951.

The Conference at Bombay was inaugurated by the Governor of Bombay and the three Conferences at Delhi were jointly inaugurated by SHRI C. RAJAGOPALACHARI, HOME MINISTER, Government of India in the absence of Prime Minister who was called upon to attend the Commonwealth Prime Ministers' Conference at London. In his Inaugural address, the Home Minister described "The qualifications for achieving success in engineering, are intellectual and moral honesty, courage, independence of thought, fairness, good sense, sound judgement, perseverance, resourcefulness, ingenuity, orderliness, application, accuracy and endurance. An engineer should have ability to observe, deduce, to correlate, cause and effect, and to apply the principles discovered." He further said that "Well, if we could only get engineers of this type in India, there could be no difficulty in giving them not only all the public works of the country to be done, but the whole Government of India, lock, stock and barrel".

These Conferences were attended by about 800 eminent engineers from all over the world. They discussed their common problems. In addition there were social functions, study tours and other side-lights of the Conference in which the delegates participated.

DR. RAJENDRA PRASAD, PRESIDENT OF THE REPUBLIC OF INDIA in his message to the Conference had said "...Such meetings provide the best opportunity of collecting the findings and pooling the experience of all participating countries for the greater benefit of humanity. Indeed such international collaboration in the matter of advancement on scientific technique and knowledge is bound to unite the various nations with ties of goodwill and understanding and help to establish an easing influence on the International political field.....I feel sure that the personal contacts that will be established at the meeting will leave a lasting impression on the representative scientists for the benefit of our respective countries...."

SHRI JAWAHAR LAL NEHRU, PRIME MINISTER in his message had said "...I should have liked to attend these Conferences myself

and to welcome the eminent scientists and experts who are coming to attend them. I am sorry I cannot do so because I will be in England at that time..... I hope that these Conferences will lead to a widening of human knowledge in regard to these vital problems and will result in decisions which will help to solve some of the problems that confront us today”.

## INDIAN INTERNATIONAL ENGINEERING EXHIBITION

As an aid to promoting the objectives of these three International Conferences, the Indian National Committee (Central Board of Irrigation and Power) arranged an Indian International Engineering Exhibition at New Delhi. Invitations for participation in the Exhibition were issued to all countries of the world through diplomatic channels. In addition, the Board invited all the National Committees of these three International Bodies to participate in the exhibition.

The Exhibition was planned to show and as far as possible to demonstrate by means of live and still models the latest development in the sciences and techniques covered by the International Conferences. The exhibits related to dams, power and irrigation, engineering research and engineering industries. The Relief Map of India and the spectacular gate designed as a working model of a dam were the masterpieces that attracted large crowds of visitors. As many as 22 nations of the world, 36 research and technical organisations from India and numerous commercial and industrial concerns participated in the exhibition.

The Exhibition premises, located in between the historical Delhi and Turkman Gate covered an area of 700,000 sq. ft. The visitors included delegates to the Conference, diplomats, foreigners, engineers and engineering students, business and common men.

DR. RAJENDRA PRASAD, PRESIDENT OF THE INDIAN REPUBLIC after seeing the Exhibition noted “.....The majestic scale of its lay-out, the picturesque arrangements made, the variety and value of the exhibits, the visible incarnation of modern engineering science and the embodied representation of the Indian irrigation projects that one saw there all made it, not only most instructive and educative but also a matter of sheer delight and wonder. It dramatically engraved on the mind of the visitors the great power projects which Mother Nature had placed at the feet of the Indian people and the steps that were being actively taken by their Government to make them available to banish want and darkness from their lives”.

SHRI JAWAHAR LAL NEHRU, PRIME MINISTER had noted “...I must have spent seven or eight hours there altogether. I wish I could have gone there oftener and spent more time. The Exhibition was fascinating and I learnt a great deal from it. For the general public who crowded to it in large number, it must have been of immense value..... I must congratulate all those concerned who made this Exhibition such a great success”.

The Exhibition was seen by almost every Ambassador and High-Commissioner in the country. The U.S.A. Ambassador had noted "....what they learned at the Exhibition alone amply repaid them for their journey to India...."

Numerous messages were received from foreign diplomats in the country, Ministers, Rajpramukhs and Governors, foreign visitors and our own engineers.

The Exhibition was planned in the first instance for one month only viz., January 10 to February 9, 1951, but on the persistent demands from the public, it had to be extended twice and was closed on March 18, 1951.

### STUDY TOURS

With a view to enabling the delegates to see the existing river valley projects in India, the construction of the major schemes, which India had embarked on, and to have an insight into her ancient culture traceable in old monuments, both religious and archaeological, the Indian National Committee arranged a Study Tour after the Conferences at Delhi commencing on January 16 night and finishing at Mysore on February 1, 1951, where the joint closing session of the Conferences was held.

Two special trains carried the delegates to the places of visit and were fully equipped with catering and other facilities. 278 delegates were taken round the country in two special trains. The mileage covered by each train was over 4,500 while over 800 miles were covered by buses etc.

Republic Day on January 26, 1951 was celebrated by the Delegates *en route* this Study Tour. THE DELEGATES FROM FOREIGN COUNTRIES jointly sent the following telegram to Shri Jawahar Lal Nehru, Prime Minister of India.

"Please convey to the President of the Republic of India our respectful greetings and warm congratulations on the celebration of the Anniversary of Indian Republic Day. Please accept yourself as our patron, our greetings and felicitations upon the four most successful International Engineering Conferences recently held, one at Bombay, three at New Delhi by invitation of Indian National Committee under inspiring Chairmanship of Shri A. N. Khosla. Over 300 Conference delegates from more than thirty countries are now enjoying unforgettable experience as participants in Study Tour observing great dams for Irrigation, Reclamation, Flood Control and Power Projects in course of realisation for the benefit of the people of India. Delegates are also admiring many monuments of India's ancient civilisation".

#### 17. Engineering Museum

At the suggestion of the Prime Minister, some of the attractive exhibits and models have been collected and are on display in a temporary hall specially constructed in New Delhi in the compound

of the office of the Central Water and Power Commission. This temporary hall is just a nucleus of a bigger permanent Engineering Museum which will soon be established at New Delhi.

### 18. Silver Jubilee of the Central Board of Irrigation and Power

The year 1952 saw the Board completing its twenty-fifth year of its existence, during which time the Board's achievements were many and varied. All these achievements were possible only by the untiring efforts and willing co-operation of its Members right from the inception and from the successive Secretaries, Members of the Executive Committee and the Presidents who had spent their valuable time and personal attention to guide and administer the affairs of the Board. At its Silver Jubilee Meeting (Annual Meeting) held in 1952 messages from many dignitaries both within India and from abroad were received wishing the Board many more years of useful service to the nation.

DR. RAJENDRA PRASAD, PRESIDENT OF THE INDIAN REPUBLIC in his message said "The great need of India today is the proper harnessing and development of her irrigation and power resources. I believe that the Central Board of Irrigation and Power has been doing what it can for the fulfilment of this need. I am glad to learn that it is now completing its 25 years of useful existence and is celebrating its Silver Jubilee. I offer my congratulations and hope that with its past work as an inspiration, it will be making a still greater contribution in the future".

SHRI JAWAHAR LAL NEHRU, PRIME MINISTER OF INDIA in his message had said "The Central Board of Irrigation and Power has now been in existence for a quarter of a century. At no time previously was it called upon to shoulder the heavy responsibilities that face it today. We have to build up a new India and in that process of building up, engineers must inevitably play a very important part. It is a great enterprise and we have all to approach it with faith and with something in the nature of a crusading spirit. I hope the years to come will demonstrate what great work our engineers can do in the building up of our country".

SHRI G. L. NANDA, MINISTER FOR IRRIGATION AND POWER in his message had said "...This is an important occasion. It is of special interest to the Ministry of Irrigation and Power and also to the Departments of Irrigation in various States. We can look back with an amount of satisfaction at the period of 25 years which the Institution has already covered. The Board has performed with success its main functions of co-ordinating and guiding research and bringing about improvements in irrigation practice and methods of construction, disseminating knowledge on irrigation and allied subjects and maintaining a most up-to-date Library on irrigation and allied sciences. The Board has made valuable contributions on 'Theory of Flow and Design of Channels',....As a result of its various activities in the International sphere, the Board has been instrumental in bringing about a closer contact with eminent engineers of the world especially in sciences and techniques of water and power development in securing for India an honoured

place in the engineering field. The International Engineering Conferences and the International Engineering Exhibition in 1951 are among the outstanding achievements with which the name of the Board is associated....The Institute can now look forward to a future which will very much excel its past record....In coming years the Board can assist greatly in accomplishing this task'.

Similar messages of greetings were received from Shri Chandulal Trivedi, Governor of Punjab, Shri Sri Prakasa, Governor of Madras, and others.

Amongst the messages received from abroad were from Sir Douglas Harris. He in his message had said "As Consulting Engineer to the Government of India at that time, I had the honour to be one of the founder members of the Central Board of Irrigation. I have the most pleasant memories both of the original Meeting of 1927 and the many Sub-Committees of the Board on which I sat with my colleagues from the Provinces. I am extremely glad to know that the Board continues to flourish with much extended activities, and offer it my heartiest congratulations on the attainment of its Silver Jubilee. I send it also my best wishes for the future and that it may long continue to discharge successfully the important functions which have been committed to it".

MR. C. C. INGLIS in his message had said "..... I consider the progress of work in India in connection with irrigation and power compares favourably with that in any country in the world and I wish the Central Board of Irrigation and Power all success".

MR. GERALD LACEY in his message had said "..... All those who have been associated with the Board from its infancy must feel a measure of almost personal pride in its steady growth to strong and lusty maturity. As one who was a Member of the Research Committee from its inception, and later a Member of the Board, I must freely confess my pride in this association with the Board from its earliest days, and my conviction that the Board, as in the past, will continue to flourish and with the years, grow from strength to strength.....In England and in other countries I have found the C.B.I. publications are becoming increasingly well-known as authoritative contributions to a subject of growing importance in world progress.....In a world that is fraught with difficulties and languar, I wish the Central Board of Irrigation and Power happy and peaceful progress".

There were numerous other messages received on the occasion.

The Silver Jubilee Meeting of the Board was presided over by Shri M. S. Thirumale Iyengar and was inaugurated by Shri Jawahar Lal Nehru, Prime Minister of India.

The Board on the occasion issued a Silver Jubilee commemoration volume and distributed Relief Maps of India.

### **19. Burma's discontinuance of the Membership of the Board**

Just when the activities of the Board had sufficiently advanced after Independence, the Chief Engineer, Burma in his letter dated

April 4, 1956 communicated his decision to discontinue Burma's membership of the Board in which they were members from its inception. The President of the Board addressed the Burma Government for reconsideration of their decision, and the President and the Secretary also met the Ambassador of Burma in India. But the Chief Engineer of Burma finally replied that if not now, but at some future date he would be able to revive the membership of the Board.

## 20. Twenty-Sixth Research Committee Meeting of the Board—1956

At the invitation of the Government of Ceylon, the 1956 Research Committee Meeting of the Board was held at Colombo, outside India for the first time in its history. Over 150 delegates with an equal number from Ceylon attended the Session. While inaugurating the Research Committee Meeting, the late MR. S. W. R. D. BANDARNAIKE, THE PRIME MINISTER OF CEYLON said "We in Asia, and particularly those countries which have recently regained their freedom are quite understandably faced with some serious problems during this period of our history. We are faced with the initial problem of converting our society and economy from a colonial economy, with all the characteristics of such a society, into a free country. We have also to accomplish that task in the context of world conditions which themselves appear to be dissolving and changing from day to day. The future of our country..... depends on more intensive cultivation, more extensive cultivation and greater diversity of agriculture, so that a more stable economy may result".

SHRI G. L. NANDA, THE UNION MINISTER FOR IRRIGATION AND POWER in his message on the occasion said ".....It should enable a much closer association between the engineers of the two countries in the endeavour to promote economic and social progress by continually enlarging the benefits of irrigation and power.....I hope this Session will mark a useful stage in extending the boundaries of knowledge and in providing us with effective means of tackling our numerous problems".

The delegates to the Session were taken round on a Study Tour of the country for four days. The arrangements made for the Session and the Study Tours were perfect and excellent.

## 21. Fundamental and Basic Research Studies

Research in the field of irrigation and hydraulic engineering is being conducted in the Irrigation Research Stations for almost 30 years. It was in 1937, that the Central Board of Irrigation stressed on the Government of India the need for research on Fundamental and Basic Problems, but till 1959, it could not be brought into effect. The Research Stations had all along functioned primarily as test-houses, where experiments had been conducted to check up departmental proposals and to investigate problems of local interest.

As the Central Co-ordinating Authority for all research concerning Water Resources Utilisation in the country, the Central Board of Irrigation and Power had been consistently voicing the need for

research development. In 1953, the Board formulated a scheme of research on Fundamental and Basic Problems with a view to evolve improved designs and techniques to tackle the number of multi-purpose river valley projects envisaged in the Five-Year Plans.

After due scrutiny by an Expert Committee, the Government of India approved the first scheme of studies on Fundamental and Basic Problems relating to River Valley Projects and Flood Control Works, *vide*—their Letter No. EL-1161(21)/56 dated August 30, 1957. It included twelve problems under the Second Five-Year Plan with a plan provision of Rs. 105 lakhs. The problems are (I) Air-entrainment, (II) Turbulence, (III) Cavitation, (IV) Design of Channels, (V) Engineering Properties of Soils, (VI) Sedimentation studies in Streams and Reservoirs, (VII) Sub-soil Flow, (VIII) Standardisation of the use of *Surkhi* and other puzzolanic materials in Mortar and Concrete, (IX) Principles of Mortar and Concrete Mix Design, (X) Studies on Vibrations in Soil under Machine Foundations, (XI) Development of Economic alternatives to Stone for River Protection Works, and (XII) Instrumentation.

Under the supervisory control of the Central Board of Irrigation and Power, the work was assigned to different Research Stations in the country, during the II Plan, which included (1) Central Water and Power Research Station, Poona, (2) Punjab Irrigation and Power Research Institute, Amritsar, (3) Indian Institute of Science, Bangalore, (4) Uttar Pradesh Irrigation Research Institute, Roorkee, (5) River Research Institute, West Bengal, Calcutta, (6) Andhra Pradesh Engineering Research Laboratories, Hyderabad, (7) Silt and Construction Materials Directorate, Central Water and Power Commission, New Delhi, (8) Soil Mechanics and Research Division, Chepauk, Madras-5, (9) Bihar Institute of Hydraulic and Allied Research, Patna, (10) Mysore Engineering Research Station, Krishnarajasagar, (11) Irrigation Development Division, Poona (now renamed as Maharashtra Engineering Research Institute, Nasik) and (12) River Research Station, Gauhati.

In respect of Sedimentation studies, under Problem VI, work has been started on the following reservoirs:—

- (1) Bhakra—Punjab, (2) Panchet Hill and Maithon—D.V. C. (3) Mayurakshi—West Bengal, (4) Hirakud—Orissa, (5) Matatila—U.P., (6) Gandhisagar—Madhya Pradesh, (7) Nizamsagar—Andhra Pradesh, (8) Tungabhadra—Mysore, and (9) Lower Bhavani—Madras.

While the Board discharges its obligations on the advice of a Standing Advisory Committee for Research Programme and Co-ordination, the financial and monetary control in respect of grant-in-aid is exercised by the Government of India through the respective administrations under which the different Research Stations function. The Government of India are, however, mostly guided by the advice of the Board. The Centrally controlled Research Stations get their funds through their normal budgetary allotments.

The progress during the Second Plan was not significant owing to non-availability of some of the precision instruments involving



foreign exchange and other procedural difficulties. Even so, the progress had not been discouraging.

The Board appointed Shri D. V. Joglekar, formerly Director, Central Water and Power Research Station, Poona, as an Adviser for guiding the studies relating to Research in Fundamental and Basic Problems. He visited different Research Stations and tendered advice and guidance for the proper conduct of Research.

Foreign exchange released by the Government of India during the Second Plan enabled certain equipments being procured from foreign countries.

To facilitate free and detailed discussions on methods and practices adopted by research workers engaged on common problems, the Standing Advisory Committee for Research Programme and Co-ordination decided to hold zonal meetings quarterly. These meetings are held regularly at different places in the country by rotation.

It was decided to set up a small museum in the Board's office to collect and preserve one set of equipments perfected indigenously by Research Stations. This is just being acquired.

In addition to the twelve problems mentioned above, on which study be continued during the Third Five-Year Plan, the following eight more problems have been included for study:—

- XIII. Utilisation of Isotopes in Sub-soil Investigations and soil compaction control.
- XIV. Investigations on soil compaction of different soils in wet conditions and standing water with particular reference to construction of earthen dams.
- XV. Development of Precast technique in Hydraulic Structures.
- XVI. Minimising Loss of head through improvement of trash-racks, penstock etc., of hydro-electric structures.
- XVII. Losses due to absorption, percolation and evaporation in still and flowing water on irrigation works:
  - (a) Determination of losses.
  - (b) Determination of and minimising evaporation losses in reservoirs.
- XVIII. Selection, processing and specification of aggregates, both fine and coarse, for concrete work in Hydraulic structures along with the study of thermal properties and physical characteristics of aggregates and behaviour of concrete under prolonged submergence and continuous wet conditions with particular reference to entry of water in air-pores.
- XIX. Experimental methods of Stress Analysis in Hydraulic Structures.
- XX. Volute Siphon Studies.

The above problems have been suitably distributed amongst the various Research Organisations in the country and some of the work has been allotted to the new Research Stations, viz., Gujarat Engineering Research Institute, Baroda; Kerala Engineering Research Institute, Peechi; Koyna Project Research Laboratory, Koyna; Irrigation Research Station, Poondi. A sum of Rs. 120 lakhs have been sanctioned for the work to be carried out during the Third Plan.

In the beginning of the Third Five-Year Plan a Sectional Committee on Power of the Standing Advisory Committee of this Board was formed to promote power research under the various State Electricity Boards and it has suggested studies on power-system problems which include planning, improvement of existing systems, various design systems, design problems, basic study in the field of electrical engineering, and research work in the field of development of equipment and apparatus.

The Sectional Committee, therefore, recommended the study of the following 19 problems among the various Research Units which have already been formed or are under formation in the various State Electricity Boards:—

- I. Effect of contamination in atmosphere in behaviour of insulators, specially in industrial areas.
- II. Prevention of corrosion in the iron parts of the insulators.
- III. Lightning behaviour.
- IV. Design of lightning arrestors.
- V. Behaviour of insulating oil during operation and to devise ways and means by which the used insulating oil could be reconditioned.
- VI. Study of heat transfer problems in the various equipments, at present being manufactured in India so as to devise ways and means to achieve economy.
- VII. To evolve a measuring device to measure effect of lightning of transmission lines.
- VIII. To study the influence of transmission lines on communication circuits and to devise cheaper means to minimise interference under Indian conditions.
- IX. To investigate new methods for testing circuit breakers, fuses etc. without unduly loading the power system.
- X. Problems of design and construction of EHV lines in interconnecting various regional power systems, including corona, structural and other studies.
- XI. To do research work in the manufacture of electrical machinery.
- XII. Fuel problems in thermal stations.
- XIII. Feed water problems in thermal stations.

- XIV. Development of 2 million volts Van-De-Gräff Generator for Polymerisation studies of insulating materials.
- XV. Design, Development and Construction of a D.C. network analyser for study of power system, problems like selecting circuit stresses etc.
- XVI. To collect geological data, measure resistivity of earth, seasonal variation of the same at different parts of the State.
- XVII. To record the frequency and measure the severity of lightning strokes.
- XVIII. To collect all possible statistical data in connection with lightning outages of the transmission system and comparative studies of different types of over-head line and sub-station efficacy of different protective devices in relation to power outages.
- XIX. To collect data in regard to wind velocity, humidity and similar other factors which are essentially required for proper design of transmission structures and sub-station equipment particularly in coastal areas of West Bengal.

The Government of India have sanctioned a sum of Rs. 30 lakhs during the Third Plan for carrying out research on these power problems. So far seven Research Units viz., (1) Andhra Pradesh State Electricity Board, (2) Madras State Electricity Board, (3) Madhya Pradesh State Electricity Board, (4) Mysore State Electricity Board, (5) West Bengal State Electricity Board and (6) Indian Institute of Science, (a) High Voltage Engineering Department and (b) Electrical Engineering Department, have already been formed and 15 problems have been allotted to them for carrying out research work.

In respect of power research also the Central Board of Irrigation and Power will supervise, co-ordinate and technically control the proposed research programme.

## 22. Present Activities of the Board

The Central Board of Irrigation and Power works as the Indian National Committee for the International Commission on Large Dams and for the International Commission on Irrigation Drainage. It also acts as the National Society in India for the International Society of Soil Mechanics and Foundation Engineering and as a Liaison Body for the International Association for Hydraulic Research and other International Scientific Organisations.

The Board assists in the deliberations of several other inter-departmental and technical organisations such as those of the Indian Standards Institution, the Indian Roads Congress, the Council of Technical Education and the Crops and Soils Wing of the Indian Council of Agricultural Research. On the recommendation of the Central Board of Irrigation and Power a permanent Standing Advisory Committee has been set up by the Government of India for research on Water Requirements of Crops. The Committee consists of representatives of the Board, Agriculture and Meteorological Departments.

The Board publishes a monthly Journal "IRRIGATION AND POWER" containing technical articles, news on irrigation, hydro-electric and allied activities both at home and abroad, details of research, new methods of construction and technique evolved etc. It is supplied free of charge to all irrigation and hydro-electric engineers of member States and such organisations as subscribe to the Board, or have exchange relations both in India and abroad.

The Board has, since 1947 undertaken the issue of a series of popular leaflets on various aspects of irrigation and hydro-electric engineering. These are written in non-technical language so as to be understood by literate persons and are distributed free. Some leaflets have been published in Hindi also.

In addition, the Board issues technical publications on important subjects incorporating the latest advances on these subjects. The publications on 'Design of Weirs on Permeable Foundations', 'Irrigation Canal Falls', 'Regime Flow in Incoherent Alluvium', 'Fluming', 'Silting of Reservoirs', 'The River Behaviour, Control and Training', 'Design of Siphons', 'Tube-well and Ground water Resources' etc., are some of the important publications issued by the Board.

The Board has also established contacts with institutions and individuals in India and about 40 other countries engaged in irrigation and hydro-electric engineering and allied subjects with a view to have free exchange of each other's publications. The number of such contacts now in operation is 263 out of which over 200 are outside India. Due to the establishment of these exchange relations, quite a large volume of literature is received free of cost and thus the Board remains in touch with the latest advances in engineering in India and other countries. The Library and Information Bureau is now located in the Bikaner House at New Delhi and serves the Board Members and their Engineers and Research Officers by supplying them with the latest information and literature on irrigation and hydro-electric engineering.

The principal function of the Board, after the formation of the Central Water and Power Commission, is to co-ordinate and guide research, provide liaison between States and personal contacts between officers engaged on similar work and disseminate the results of research so as to bring about an around improvement in irrigation practices and methods of construction.

This function is being achieved through two Research Committees of the Board, which consist of :

(1) *For Irrigation*

- (a) The Executive Committee of the Board.
- (b) Director, Central Water and Power Research Station, Poona.
- (c) Directors and Research Officers of the States that possess Research Organisations.
- (d) Professor of Civil and Hydraulic Engineering, Indian Institute of Science, Bangalore.

- (e) Director (Planning), Central Mechanical Engineering Research Institute, Durgapur (C.S.I.R.).
- (f) Officers connected with the design of hydraulic works as nominated by their respective States.
- (g) Professors of Universities engaged on research work pertaining to irrigation works.
- (h) Such additional persons as the Executive Committee think it desirable to co-opt.

## (2) For Power

- (a) The Executive Committee of the Board.
- (b) Director (Research), Central Water and Power Commission (Power Wing).
- (c) Officers connected with the design and research work in the State Electricity Boards and Projects.
- (d) Professors of High Voltage and Electrical Engineering, Indian Institute of Science, Bangalore.
- (e) Officers nominated by Heavy Electricals, Railways and other organisations interested in power engineering.
- (f) Professors engaged on research work in power engineering.
- (g) Such additional persons as the Executive Committee think it desirable to co-opt.

A meeting of the Research Committee for both is held every year in June-July. Detailed technical discussions are held on the latest developments and research work carried out in the country and the Research Committee makes its recommendations to the Board regarding technical problems under investigation which are then discussed and ratified at the Annual Meeting of the Board being held in November every year. The details of the research work together with the discussions thereon at the meetings of the Research Committee and the Board's discussions thereon are published annually in Annual Reports (Technical) of the Board.

A large number of technical matters of current interest are on the Board's agenda for study and consideration of latest developments.

## 23. Publications of the Board

The Board has brought out about 70 technical publications\* which have been of immense value to the engineering profession and are being treated as reference books both in India and abroad. In addition to the technical publications, the Board is issuing every year Annual Report (Technical) which gives in brief the work that is being done at the different Research Stations and contains papers and discussions thereon contributed to the Research Committee Meeting.

Since 1947 the Board has been issuing popular leaflets in layman's language on the developments of irrigation and power and so far 11 such leaflets have been issued.

---

\*For list of Publications see Appendix II.

Since 1954 Research pamphlets are also being issued which contain a description of the problems that are in hand at the different Research Stations.

In addition to all these technical publications, popular leaflets, Research pamphlets, etc., the Board is issuing every month "IRRIGATION AND POWER" Journal and "CENTRAL BOARD OF IRRIGATION AND POWER ABSTRACTS" giving abstracts of literature received in the Library and Information Bureau.

#### **24. Collaboration with other Institutions**

The Board from its very inception has been actively collaborating with the activities of several technical institutions in the country and the Secretary or the President are represented in some of the Sub-Committees of Indian Roads Congress, Council of Scientific and Industrial Research, Indian Council of Agricultural Research, Indian Standards Institution etc. A list of such Committees and Sub-Committees on which the Board is represented is given below:—

1. Permanent Advisory Committee for Research on Water Requirements of Crops.
2. All-India Council of Technical Education.
3. Engineering Standards Committee of the Indian Standards Institution.
4. Engineering Division Council of the Indian Standards Institution.
5. Drawing Sectional Committee of the Indian Standards Institution.
6. General Council of the Indian Standards Institution.
7. Building Division Council of the Indian Standards Institution.
8. Joint Sub-Committee for Concrete Reinforcements of the Indian Standards Institution.
9. Sub-Committee on Safety Regulation of the Indian Standards Institution.
10. The Electro-technical Division Council of the Indian Standards Institution.
11. Pumps Sectional Committee of the Indian Standards Institution.
12. Fluid-flow Measurement Sub-Committee of the Indian Standards Institution and its Selection Committee.
13. Central Board of Geophysics.
14. Bridges Sub-Committee of the Indian Roads Congress.
15. Soil Research Committee of the Indian Roads Congress.
16. Indian Library Association.
17. Permanent Committee to review the Standardisation of Methods and Apparatus used in Soil testing and classification of Soils.

18. Crops and Soils Wing of the Board of Agriculture and Animal Husbandry in India (I.C.A.R.).
19. Expert Committee on Engineering and Scientific Terminology (Ministry of Education).
20. Advisory Committee of Rain and Clouds Physics Research Unit of Council of Scientific and Industrial Research.
21. Civil Engineering and Hydraulic Research Committee of Council of Scientific and Industrial Research.
22. Advisory Committee for the Water Resources Development Training Centre, University of Roorkee, Roorkee.
23. Annual Inspection Committee for Water Resources Development Training Centre of Roorkee University.
24. Evaporation Control Research Committee of the Council of Scientific and Industrial Research, National Physical Laboratory.
25. Indian National Society of Soil Mechanics and Foundation Engineering.
26. Committee on Water Resources, Planning Commission.

The President or the Secretary of the Board regularly attends the meetings of the above Committees and thus collaborates with the work of other organisations.

## 25. Central Board of Irrigation and Power Gold Medal

The Central Board of Irrigation and Power has since 1949 instituted a 'Central Board of Irrigation & Power Gold Medal' to be awarded every year to a person (or persons) whose contribution to research (basic or applied) technique, theory or practice relating to the development of water resources in India is adjudged by the Executive Committee of the Board to be of an outstanding original contribution of the preceding year.

The Board in 1960 decided to award 4 such Gold Medals, one for each of the following subjects, as per rules given below:—

- (a) Hydrology
- (b) Concrete Technology
- (c) Soil Technology
- (d) Power Research

### MEDAL RULES

1. Central Board of Irrigation and Power Medal has been instituted to encourage research, theory or practice relating to water resources development of India.

Separate Medals will be awarded for contribution in each of the following subjects:—

- (a) Hydraulics
- (b) Concrete Technology
- (c) Soil Technology
- (d) Power Research

2. The Medal will be awarded at the Annual Meeting of the Board to a person (or persons) whose contribution to research, theory or practice relating to water resources of India is adjudged by the Executive Committee of the Board to be the best and substantial contribution of the preceding year.

3. The year for purposes of award of the Medal will be the calendar year.

4. The contribution may be in the form of a paper presented at the meeting of the Central Board of Irrigation and Power or at its Research Committee or may be a paper published for the first time either in the Central Board of Irrigation and Power Journal or as a Central Board of Irrigation and Power Publication.

5. Proposals for the award should be made by the Members of the Board and these proposals should be sent to the Secretary, Central Board of Irrigation and Power, Curzon Road, New Delhi so as to reach him by the end of April each year. Proposals should contain complete information pertaining to the contribution, as far as possible, including 5 copies of the article or the paper or the publication.

6. The merit of the award shall be adjudged by and at a meeting of the Executive Committee of the Central Board of Irrigation and Power. The decision of the Executive Committee will be final.

7. In case the contribution is considered not to be of substantial nature, the Executive Committee may decide not to award any Medal in that particular year.

### RECIPIENTS

The first recipient of the Central Board of Irrigation and Power Gold Medal was Shri V. Ganesh Iyer for his paper on 'Volute Siphon Spillways' in the year 1951. In 1960 the award was given to Shri D. V. Joglekar for his contribution on 'Hydraulics' and in 1961 to Prof. N. S. Govinda Rao for his contribution on 'Cavitation—its Inception and Damage'.

In addition to the Central Board of Irrigation and Power Gold Medal the Board awards 'Certificates of Merit' to individuals or Research Stations for outstanding work. The following Research Stations and individuals have so far been awarded the Certificate of Merit:—

1. Hyderabad Engineering Research Laboratories for the work done by Shri R. K. V. Narasimham on 'Interacting Jet Dissipators' in 1955.
2. Dr. R. C. Hoon for 'Productive rating of Land' in 1955.
3. Hirakud Research Station for the work done by Dr. R. C. Hoon and his staff, on 'Air-entrainment in Cement Mortar' in 1955.
4. Shri N. K. Aggarwal for his article on 'Construction of Bridge on the Spillway of the Hirakud Dam' in 1961.



5. Sarvashri Bahadur Ali and B. Anjiah for their joint article on 'Laboratory studies on Permeability Characteristics of Soils' in 1961.

## 26. Office Building for the Central Board of Irrigation and Power

According to the original recommendations of the Royal Commission on Agriculture (1928) the Central Bureau of Information for Irrigation was to have its headquarters at Delhi. Actually when the Central Board of Irrigation was formed as an active organisation in May 1931, it opened its office at Simla. It will be interesting to know that in Simla, the Board's office was shifted from place to place *i.e.*, 'Kennedy Cottage'—1931 to March 1935; 'Telegraph Building'—March 1935 to April 1938; 'Sherwood'—April 1938 to March 1940; 'Railway Board Building'—March 1940 to April 1941; and 'Kennedy House' from April 1941 to November 1951, when it moved to Delhi, where also it has no permanent building of its own. The Library and Information Bureau is housed in the Bikaner House alongwith the office of the Central Water and Power Commission and the Secretary's office is located at Curzon Road Barracks, where sufficient space does not exist to accommodate the growing expansions of its activities.

The Government of India is actively considering the question of providing adequate permanent accommodation for the Board in the Third Plan including provision for the Library.

## 27. Conclusion

The Central Board of Irrigation and Power which has been serving its constituents for the last over 30 years is thus a unique organisation. But for this Unique forum, the Chief Engineers and Research Workers in charge of Irrigation and Power in the country and in the neighbouring country of Ceylon could not meet together and discuss all their problems, which are vital for national development. The growing increase of its Membership from 10 in 1931 to 103 at present and the large number of technical literature brought out so far, apart from the steady expansion of its activities, are an index of the Board's useful service and its important role in the country.

In the words of the Prime Minister, Shri Jawahar Lal Nehru, the two words "Irrigation and Power" concisely represent the basic needs for material development in India today. To this end, the Board has been dedicated and endeavouring its best. Being constituted of 103 senior and experienced engineers, the Board possesses the highest degree of technical competence and enjoys a world-wide reputation. Some of its members have held and are holding with honour high offices in International bodies.

In these critical years of Planned National Development, the Members of the Board fully recognise the importance of the part they have to play in improving standards and economising costs of undertakings relating to Water Resources Development and every activity of the Board is directed towards achieving this goal.

**28. Presidents of the Board**

<i>Name</i>	<i>Year</i>
Mr. D. G. Harris, C.I.E.	1930
Sir Bernard Darley, Kt. C.I.E.	1930-31
Mr. R. P. Hadow, C.I.E.	1931-32
Mr. R. P. Hadow, C.I.E.	1932-33
Mr. C. M. Lane	1933-34
Mr. W. L. C. Trench	1934-35
Mr. F. Anderson, C.I.E.	1935-36
Mr. C. M. Boss	1936-37
Mr. M. R. Richardson, C.I.E.	1937-38
Mr. A. Gorden, C.I.E.	1938-39
Mr. F. A. Farquharson	1939-40
Mr. C. E. Aitken	1940-41
Rao Bahadur L. Venkata Krishna Ayyar	1941-42
Mr. G. A. M. Brown	1942-43
Mr. F. F. Haigh	1943-44
Mr. F. H. Hutchinson	1944-45
Rai Bahadur A. N. Khosla, I.S.E.	1945-46
Rai Bahadur A. N. Khosla, I.S.E.	1946-47
Rai Bahadur A. N. Khosla, I.S.E.	1947-48
Rao Bahadur A. R. Venkatacharya	1948-49
Shri M. P. Mathrani, I.S.E.	1949-50
Shri A. N. Khosla, I.S.E.	1950-51
Shri M. S. Thirumale Iyengar, I.S.E.	1951-52
Shri Kanwar Sain, I.S.E.	1952-53
Shri A. C. Mitra, I.S.E.	1953-54
Shri D. R. Mehta, I.S.E.	1954-55
Shri S. L. Malhotra, I.S.E.	1955-56
Shri U. N. Mahida, I.S.E.	1956-57
Prof. M. S. Thacker	1957-58
Shri M. Hayath	1958-59
Dr. K. L. Rao	1959-60
Shri H. R. Bhatia	1960-61
Shri U. Ananda Rau, I.S.E.	1961-62

**29. Secretaries of the Board**

Mr. A. M. R. Montagu	May 2, 1931 to April 30, 1935.
Mr. M. T. Gibling	May 1, 1935 to April 30, 1939.
Mr. A. R. B. Edgecombe	May 1, 1939 to July 31, 1941.
Mr. A. R. Thomas	August 21, 1941 to August 20, 1945.

<i>Name</i>	<i>Year</i>
Shri N. D. Gulhati	August 21, 1945 to March 29, 1949.
Shri S. L. Malhotra	March 29, 1949 to September 15, 1952.
Shri M. L. Aggarwal	September 16, 1952 to December 31, 1955.
Shri Baleshwar Nath	January 1, 1956 to March 8, 1960.
Shri D. V. Joglekar	March 8, 1960 to May 8, 1960.
Shri P. H. Vaidyanathan	May 9, 1960 to date.

---

## CONSTITUTION OF THE CENTRAL BOARD OF IRRIGATION AND POWER

[As framed by the Board in June 1960 and approved by the Government of India, Ministry of Irrigation and Power vide—letter No. EL.I.19 (17)/60, dated 18th August, 1960.]

### PREAMBLE

1. The Central Board of Irrigation was constituted on January 1, 1927 to examine and report on such irrigation, hydro-electric and river control projects or other problems on the subject, as might be referred to them by the Government of India or the Crown Representative; to advise any Provincial Government or any Indian State admitted to the full membership of the Board, on any difficult technical question connected with a water utilisation or flood control project under preparation, on which their advice might be sought if required; to advise the Government of India on technical points involved in any dispute between Provincial Governments or between a Provincial Government and an Indian State; to co-ordinate research work; and to arrange for the publication of technical papers. As a result of the recommendations made by the Royal Commission on Agriculture in India, 1928, the following additional duties were entrusted to and assumed by the Board with effect from May 1, 1931:—

- (i) To establish contacts with institutions and individuals in other countries with a view to the exchange of publications and information.
- (ii) To maintain a library and collect and supply information on irrigation and allied subjects.
- (iii) To disseminate the results of research on irrigation and allied subjects.
- (iv) To contribute information on irrigation and allied subjects for publication in the press.

2. In 1945 the Government of India established the Central Waterways, Irrigation and Navigation Commission, in accordance with the Government of India Resolution No. DW.XVI-1(1), dated January 16, 1948, and which, in 1951 was changed to Central Water and Power Commission, vide—their Resolution No. EL-1-201(5), dated the 21st/24th April, 1951, this body has been charged with the general responsibility of initiating, co-ordinating and

furthering in consultation with the State Governments concerned, schemes for the control, conservation and utilisation of water resources, throughout the country for purposes of water-power generation, irrigation, navigation and flood control, and if so required the construction of any such schemes on behalf of the Government of India.

In exercise of the above responsibilities, it is the function of the Central Water and Power Commission, *inter alia* to:—

- (i) advise, and assist, when so required, the State Governments (or River Commissions, Corporations or Boards that may be set up) in the investigation, surveys and preparation of river valley development schemes;
- (ii) advise the Government of India in respect of water and water-power rights and disputes as between States, of the effect which any schemes for the conservation and utilisation of water may have on the interest of the concerned States and of the interpretation of any agreement in this regard between the said States;
- (iii) advise the Government of India in regard to any other matter that may be referred to the Commission in connection with river valley development;
- (iv) standardise instruments, methods of observations and record, materials of construction, design and operational features;
- (v) conduct and co-ordinate research on various aspects of river valley development schemes such as water-power generation, irrigation, navigation, flood control, etc. and the connected structural and design features; and
- (vi) to collect, co-ordinate the collection of, publish and analyse data relating to water-power, waterways, tidal rivers, rainfall, run off and temperatures, ground water resources, silting of reservoirs, behaviour of hydraulic structures, etc. and to act as the Central Bureau of Information in respect of these matters.

3. In view of the above, the Government of India, have now assumed full financial responsibility for maintaining the Library and the Information Bureau referred to in para 1(ii) above and have taken over, with effect from April 1, 1946, the Library and Information Bureau of the Board, to arrange for its expansion, maintenance and operation. The facilities previously offered by the Library to the States have not, however, been curtailed in any respect. The privileges and rights of the Board as in the Library are given in the Schedule appended to these rules.

4. In view of the constitution of the Central Water and Power Commission, as detailed above, some of the functions previously performed by the Central Board of Irrigation, now fall within the sphere of activities of the Central Water and Power Commission. It has, therefore, been found necessary to revise the Constitution of the Board to avoid any confusion or overlap of functions between the two organisations. The following rules have, therefore, been

framed to govern the Constitution and activities of the Board, these rules supersede the existing rules on the subject.

## RULES

### SECTION I

#### OBJECTS

1. The functions of the Central Board of Irrigation and Power, hereafter called "the Board", shall be to:—

- (i) establish contacts with institutions and individuals in India and abroad with a view to the exchange of publications and information;
- (ii) collect and supply information on irrigation, electricity and allied subjects;
- (iii) co-ordinate research on irrigation, electricity and allied subjects and to disseminate results of such research;
- (iv) contribute information on irrigation, electricity and allied subjects for publication in the press; and
- (v) to publish relevant literature.

The Board shall also work as:

- (i) Indian National Committee for the International Commission on Large Dams;
- (ii) Indian National Committee for the International Commission on Irrigation and Drainage;
- (iii) Liaison Body for the International Association for Hydraulic Research;
- (iv) Co-ordinating Body for Technical Organisations like Indian Standards Institution, Indian Council of Agriculture Research, etc.

2. The Board shall have two Research Committees attached to it—one for Irrigation subjects and another for Power subjects.

For Irrigation subjects, the Committee shall consist of:

- (a) The Executive Committee of the Board as prescribed under Rule 18.
- (b) Director, Central Water and Power Research Station, Poona.
- (c) Directors and Research Officers of the States that possess Research Organisations.
- (d) Professor of Civil and Hydraulic Engineering, Indian Institute of Science, Bangalore.
- (e) Director (Planning), Central Mechanical Engineering Research Institute, Durgapur (C.S.I.R.).
- (f) Officers connected with the design of hydraulic works as nominated by their respective States.
- (g) Professors of Universities engaged on research work pertaining to irrigation works.

- (h) Such additional persons as the Executive Committee think it desirable to co-opt.

For Power subjects the Committee shall consist of:

- (a) The Executive Committee of the Board as prescribed under Rule 18.
- (b) Director (Research), Central Water and Power Commission (Power Wing).
- (c) Officers connected with the design and research work in the State Electricity Boards and Projects.
- (d) Professors of High Voltage and Electrical Engineering, Indian Institute of Science, Bangalore.
- (e) Officers nominated by Heavy Electricals, Railways and other organisations interested in power engineering.
- (f) Professors engaged on research work in power engineering.
- (g) Such additional persons as the Executive Committee think it desirable to co-opt.

Except *ex-officio* members, other members will have to be approved by the Executive Committee.

The object of the Research Committee shall be to plan and co-ordinate research work in the field of irrigation, hydraulics, power engineering and allied subjects. This Committee shall also serve as a Technical Adviser to the Board on matters connected with research.

## SECTION II

### CONSTITUTION

3. The Board shall consist of the following Members whose names shall be entered on the Roll of the Board as they become eligible:—

- (i) Chief Engineers, Irrigation and Electricity Branches of the States and Union of States, Engineers dealing with matters concerning water and electricity, employed by the Central Government with the status of Chief Engineer or higher and Chief Engineer/Engineer Member, as the case may be, of Electricity Boards constituted under the Electricity (Supply) Act, 1948 *ex-officio*.
- (ii) Chief Engineers, Irrigation and Electricity Branches of such other countries or administrative units outside the Union of India as may like to join the Board subject in each case to the approval of the Board and with the previous approval of the Government of India.

Provided that in all cases the Governments and Electricity Boards concerned contribute to the Board at the rates hereinafter prescribed.

4. A permanent Chief Engineer will retain his seat on the Board during periods of leave, until he ceases to be Chief Engineer of his State or Union.

### SECTION III

#### CONSTITUTION OF TECHNICAL SUB-COMMITTEES OF THE BOARD

5. The Government of India and a Government, State or other authority contributing under Rule 15 hereunder will be entitled to ask the Board to appoint a Sub-Committee of the Board to advise them on any technical question and questions connected with any irrigation, river training, hydro-electric or allied work.

6. Technical Sub-Committees of the Central Board of Irrigation and Power shall be appointed on the recommendation of the Executive Committee subject to concurrence of the authority asking for the appointment of the Sub-Committee and shall consist of Members of the Central Board of Irrigation and Power. They shall ordinarily consist of two Members possessing the widest experience of works akin to the problem under consideration.

7. (a) If a Sub-Committee so wishes and with the concurrence of the authority asking for such Sub-Committee a special technical Secretary and staff and/or an assistant technical Officer or Officers may be appointed by the Sub-Committee.

(b) The Executive Committee may appoint additional staff in connection with the Sub-Committees constituted by the Board on any Special subjects.

### SECTION IV

#### PRIVILEGES AND OBLIGATIONS OF MEMBERS OF THE BOARD

8. All Members of the Board, will on behalf of their Government or State or Union of States be entitled to the privileges outlined in Rules 12, 13 and 14 below.

9. Each member of the Board will receive one copy each of Administrative Report of the Board as it is published.

10. Members of the Board may be requested by the Board to serve on technical Sub-Committees of the Board.

### SECTION V

#### PRIVILEGES AND OBLIGATIONS OF GOVERNMENTS, STATES AND UNIONS OF STATES OR OTHER AUTHORITIES CONTRIBUTING OR SUBSCRIBING TO THE BUREAU OF INFORMATION

11. The Government of India will be entitled to call on the Board to select a Sub-Committee of the Board to advise them on technical points involved in any dispute between State Governments, Unions of States, or between a State Government and a Union of States.



12. A State, Union of States, Government or other authority contributing or subscribing to the Board will be entitled to receive all the publications, issued by the Board, with the exception of Administrative Reports.

13. The number of such individual publications sent to the Government or other authority shall be in accordance with the requirements of each case or as may be decided by the Executive Committee of the Board as hereafter prescribed in Rule 18.

14. Publications issued by the Board shall be supplied free of cost and postage except in the case of parcels sent by rail when railway charges will be paid by the consignee. The Board may decide to place some copies of their publications for sale to public or to such other authorities as are not entitled to free supply of those publications. Copies of such publications shall be stocked by the Manager of Publications to the Government of India and shall be sold on payment of the price indicated on the publications.

### SECTION VI\*

#### CONTRIBUTIONS TO THE FUNDS

15. A Government, State or Union of States, which is represented by a Member or Members on the Board shall contribute annually to the Board on the following basis:—

(a) Where areas irrigated annually plus area protected by drainage and embankments is:

Less than half a million acres, contribution will be	..	Rs. 2,500
Half million to one million acres, contribution will be	..	Rs. 5,000
1 million to 2 million acres, contribution will be	..	Rs. 7,500
2 million to 5 million acres, contribution will be	..	Rs. 10,000
5 million to 10 million acres, contribution will be	..	Rs. 12,500
10 million to 15 million acres, contribution will be	..	Rs. 15,000
above 15 million acres, contribution will be Rs. 2,500 extra for each additional 5 millions or part thereof.		

(b) For irrigation projects under construction half of the area proposed to be irrigated from the projects under construction will be taken for assessment of contribution.

(c) For electric generation up to:

100 million kWh. generation,  
contribution will be.

Rs. 1,000

\* Contribution to the Board is under revision. Details at page 56.

101-200 million kWh. generation, contribution will be	..	Rs. 2,000
201-300 million kWh. generation, contribution will be	..	Rs. 3,000
301-400 million kWh. generation, contribution will be	..	Rs. 4,000
401 up to 1,000 million kWh. generation, contribution will be Rs. 500/- for 100 million kWh.		
Above 1,000 million kWh. generation, contribution will be Rs. 250/- for 100 million kWh. or part thereof.		

In any year, an administration will pay on the basis of the figures of area irrigated by Government controlled works and those of area protected by drainage in that administration relating to the latest year for which statistics are available. Although on the basis of the area irrigated in the Centrally Administered Areas, the Central Government are liable to contribute only Rs. 2,500/- per annum, they have in view of their overall interest in the activities of the Board agreed to:

- (i) pay annually at the rate of Rs. 17,500/- per annum;
- (ii) pay for the office accommodation occupied by the Board on the basis of the standard scale applicable from time to time; and
- (iii) supply to the Board free stationery and printing.

16. A State or Union of States, Government or other authority, which is not represented by a Member on the Board, but wishes to take advantages of the facilities provided by the Board and the Library shall, if permitted, subscribe annually to the Board a sum not less than Rs. 500/-, the exact amount to be determined by the Executive Committee. The Executive Committee may at its discretion, permit any commercial engineering organisation to subscribe to the Board. The minimum annual subscription for such organisation will be Rs. 200/-, the exact amount to be determined by the Executive Committee.

17. The Board shall maintain a deposit account with the Accountant General, Punjab, Simla, or Accountant General, Central Revenues, New Delhi, for the time being into which subscribing and contributing authorities shall pay their annual subscriptions or contributions at the beginning of each financial year.

## SECTION VII

### CONSTITUTION OF THE EXECUTIVE COMMITTEE

18. A Standing Committee of the Board to be known as the Executive Committee which shall be elected from amongst the Members of the Board, and shall consist of:

- (a) The President
- (b) The immediate past-President

- (c) Two Vice-Presidents (One for Irrigation and one for Power)
- (d) Three Members (Power)
- (e) Three Members (Irrigation)
- (f) Chairman, Central Water and Power Commission—*ex-officio*.

## SECTION VIII

### PRESIDENT AND VICE-PRESIDENT

19. The President shall take the chair at all meetings of the Board and of the Executive Committee and of the Research Committee at which he is present and shall regulate the proceedings. In the absence of the President such duties shall devolve on the Vice-President.

## SECTION IX

### DUTIES AND POWERS OF THE EXECUTIVE COMMITTEE

20. The direction and management of the concerns of the Board are vested in Executive Committee subject to all resolutions of meetings of the Board which have been duly summoned and held in accordance with rules hereinafter laid down when such resolutions have been duly entered in the Minutes and signed by the Chairman of the meetings and the Executive Committee shall take such action as may be necessary to implement such resolutions. Further, Board may delegate on a specific resolution such powers to the Executive Committee, the President, the Secretary and any Sub-Committee of the Board as may be deemed expedient.

21. The Executive Committee shall ordinarily meet half-yearly, but shall also meet at any time that the business of the Board may require. At every meeting five shall constitute the quorum. The Executive Committee may appoint Committees for special purposes to report to the Executive Committee.

22. The Executive Committee shall convene an annual meeting of the Research Committee not less than three months prior to the annual meeting of the Board for the express purpose of reviewing research work.

23. It shall be the duty of the Executive Committee to adopt every reasonable means for the advancement of the objects of the Board; to provide for properly conducting the business of the Board in all cases of emergency, and to arrange, subject to the approval of the Board, for the publications of such papers and documents as may be calculated to advance professional knowledge in the field of Irrigation and Hydro-electric Science.

24. In the event of any matter arising, in regard to which a decision of the Executive Committee is required urgently, the Secretary shall prepare a note on the subject and circulate it to the Executive Committee for orders.

25. Subject to the general control of the Executive Committee or as otherwise provided in the schedule appended, the Secretary is empowered to employ additional temporary technical, clerical and menial staff as the exigencies of the work in the Secretary's Office demand, and to grant honoraria or remuneration to such employees at his discretion and further to sanction travelling allowance for employees in accordance with the scale which it may approve, subject to this entailing no excess expenditure over the sanctioned budget.

26. The Executive Committee shall have full powers to authorise expenditure from the funds of the Board, within the limits of the budget sanctioned by the Board.

27. The office of the Board shall be inspected once a year by the President or a member of the Executive Committee nominated by him.

## SECTION X

### DUTIES OF THE RESEARCH COMMITTEE

28. The Research Committee shall meet ordinarily once a year, and on at least one other occasion during the year to exchange views informally.

29. In the event of the absence of the President of the Board, the Vice-President shall take the chair at the meeting. In the event of the absence of the President and Vice-President a member of the Executive Committee shall take the chair. In the event of the absence of all members of the Executive Committee, the meeting may elect any member of the Research Committee to take the chair at the meeting.

30. The Annual Meeting will be utilised to secure material for a report to the Board. The report will describe briefly research work during the preceding year and make suggestions for further research in the ensuing year.

31. Prior to the Annual Meeting, members of the Committee, who so desire may furnish the Secretary with advance notes on selected items of the agenda or allied subjects, for circulation among the other members. Members in receipt of such notes who desire to offer any criticisms or comments shall address the author direct prior to the meeting in order that, if possible a measure of agreement may be reached before open discussion in the Committee.

32. At the Annual Meeting each officer present shall be asked to express briefly his opinion on the matter in hand. General discussion shall follow. At the close of the discussions, the Chairman will summarise the debate in a manner suitable for record. He may state the different points of view and if any unanimous agreement has been reached, this shall be recorded in the form of a resolution.

33. One item of the agenda at the Annual Meeting of the Research Committee shall be the selection of subjects for discussion at the following Annual Meeting. To assist in the selection, the Secretary shall prepare a list of enquiries in regard to which he has been unable to satisfy the enquirer and upon which research appears to be indicated. The Research Committee may add further subjects to this list. The selection of the particular items for next year's meeting shall be guided by claims to general interest.

34. Other items on the agenda shall be a discussion on "Current Research Activities" and the "Co-ordination of research work for the ensuing year". Research and experiments desired by the Board shall be laid before the Research Officers, who will divide up the work, as far as possible, by mutual agreement.

35. Research Programme, revised as a result of discussion at the Annual Research Committee Meeting, shall be brought before the succeeding meeting of the Board.

36. Research Officers shall communicate their annual reports and summarise thereof to the Secretary to the Board, not less than six weeks before the Annual Meeting of the Research Committee.

37. The Proceedings of all Research Committees shall be included in the Annual Technical Report of the Board. Printed copies of the Proceedings of the Annual Meeting of the Research Committee shall be circulated only to members of the Board and of the Research Committee.

## SECTION XI

### THE AUDITORS

38. The Auditor General, India or any other officer authorised by him shall carry out such audit as is necessary and the Secretary shall be responsible for carrying out the requirements of audit in this regard.

## SECTION XII

### THE SECRETARIES

39. The Secretary to the Board shall be appointed normally for a period of 4 years by the Board at its Annual Meeting, but the appointment shall be subject to the approval of the Government of India.

40. It shall be the duty of the Secretary under the direction of the Executive Committee, to conduct the correspondence of the Board; to attend the meetings of the Board, of the Executive Committee, of the Research Committee and such other Sub-Committees as may be appointed by the Board, to take minutes of the proceedings of such meetings; to read the minutes of the preceding meeting and such communications as may be ordered to be read, to

superintend the publication of such papers as the Executive Committee may direct; to direct the collection of the subscriptions and the preparation of the accounts of the expenditure of funds, and to present all accounts to the Board for inspection and approval. He shall also engage and be responsible for all persons employed under him, and shall generally conduct the ordinary business of the Board.

### SECTION XIII

#### MEETINGS OF THE BOARD

41. The Annual Meeting of the Board shall be held ordinarily in November each year.

42. It shall be in the power of the Executive Committee to arrange for additional meetings of the Board, if found desirable.

43. In the event of the absence of the President, the Vice-President shall take the chair at the meeting. In the event of the absence of the President and Vice-President, a Member of the Executive Committee shall take the chair. In the event of the absence of all members of the Executive Committee the meeting may elect any member of the Board to take the chair at the meeting.

44. All Members shall have a right to attend and vote, and 15 persons present shall constitute the quorum, and each such member personally present shall have one vote. In the event of quorum not being present within 30 minutes of the hour fixed for the commencement of the meeting, the meeting shall stand adjourned. The accidental omission to send notice of a meeting to or the non-receipt of notice by any Member shall not invalidate the proceedings at the meeting.

45. At all Board Meetings questions shall be decided according to the majority of votes properly given thereat, and in the case of equality, the Chairman shall have a second or casting vote. Where the question under consideration relates exclusively to the Union of India, Members of the Board appointed under Rule 3(ii) will not participate in the voting.

46. In the event of any matter arising, in regard to which a decision of the Board is required urgently, the Secretary, if he is so instructed by the Executive Committee, shall prepare a note on the subject and circulate it to the President and Members for opinion.

47. Election of Office-bearers and business of Annual Meeting.

(a) *Election of Office-bearers:*

(i) The President for the ensuing year will be elected by the Executive Committee in office one month in advance of the Annual Meeting. The President elect shall deliver his first Presidential Address at the Annual Meeting.

- (ii) Other Members of the Executive Committee shall be elected at the time of the Annual Meeting.
- (iii) The Vice-Presidents shall be elected by the new Executive Committee after their election.
- (iv) The new Executive Committee shall take office at the time of Annual Meeting.
- (v) Except for the *ex-officio* members, the number of elected members for any Executive Committee shall not be more than one from the same State or Centre.

(b) *Business during the Annual Meeting:*

The Board at its Annual Meeting shall consider:

- (i) The programme of the work of the Board for the ensuing year.
- (ii) Review of the research work on irrigation and power in India and other administrations which contribute to the Board.
- (iii) Consideration of the accounts for the preceding year.
- (iv) Consideration of the budget for the ensuing year.
- (v) Any other business requiring consideration of the Board.

48. The Board shall further consider any professional or technical questions of which due notice has been given by the Government of India.

49. The Board shall also decide what special questions call for particular study during the ensuing year. The questions so decided upon shall be taken up for study only after the technical questions of which notice has been given to them by the Government of India have been considered, *vide* Rule 48.

50. To aid in the discussion of professional or technical questions the Executive Committee may invite Research Officers and any other officer to attend the professional and technical discussions of the Board.

#### SECTION XIV

##### FEES OF THE MEMBERS OF THE SUB-COMMITTEES OF THE BOARD

51. The Members of the Board when serving on Sub-Committees of the Board will be entitled to a fee of Rs. 200/- each per day.

#### SECTION XV

##### SUBSCRIPTIONS TO SOCIETIES AND ASSOCIATIONS

52. Subject to the general control of the Executive Committee the Secretary is empowered to sanction subscriptions by the Board to Scientific and Engineering Societies and Associations or to reduce the number of such subscriptions, subject to the sanctioned budget.

## SECTION XVI

## ENACTMENT OF RULES

53. No additions, alterations or omissions in these rules shall be made except by the authority of a resolution passed at a Board Meeting which has been convened and conducted in accordance with the provision of Rules 41—46 and additions and alterations to the rules decided upon by the Board shall require the approval of the Government of India before they become operative. The Executive Committee when directed by a resolution of a Board Meeting to make a new rule or to alter or revoke an existing one, shall frame the new or altered rule and shall after final approval by a majority of members, submit the proposed addition, alteration or revocation to the Government of India. And in the event of the proposal for such addition, alteration or revocation being duly agreed to by the Government of India, the rules shall be amended accordingly.

## SECTION XVII

## THE PROPERTY OF THE BOARD

54. The property and the effects of the Board are vested in the Government of India for the furtherance of the objects of the Board.

55. Every paper, map, plan, drawing, or model, presented to the Board shall be considered as the property of the Government of India, unless there has been some previous arrangement on the contrary, and the Board may publish the same in any way and at any time they think proper. But should the Board refuse or delay the publication of such paper beyond a reasonable time, the author thereof shall have a right to copy the same, and to publish it as he may think fit, having previously given three months' notice of his intentions in writing to the Secretary to the Board. Except as hereinbefore provided no person shall publish or give his consent to the publication of any communication present to and belonging to the Board, without the previous consent of the Executive Committee.

## SECTION XVIII

## FUNDS

56. The Executive Committee is empowered to invest any funds of the Board. Bonds representing investments by the Board shall be retained in safe custody by the State Bank of India, or Reserve Bank of India, New Delhi or Delhi, for the time being and interest thereon shall be collected by the aforesaid Agent/Manager and paid in cash to the Secretary.

57. Withdrawal from invested funds shall be made only with the approval of the Executive Committee.



58. In case the funds at the credit of the Board are temporarily depleted in the beginning of a financial year, the Secretary to the Board, with the previous approval of the President of the Board, may raise a loan from the Reserve Bank of India or State Bank of India, New Delhi or Delhi, for the time being against the investments of the Board held in safe custody, with that bank, subject to a maximum of one month's salary of the staff of the Board. The loan may be paid back to the bank concerned in whole or by instalments as soon as sufficient funds have been received from contributions, etc. A new loan may not be raised until the previous loan has been repaid in full.

---

**SCHEDULE (vide—PARA 3 OF THE PREAMBLE TO THE RULES)**

In this Schedule:—

- (i) the references to the Library are to the Library since taken over from the Board by the Government of India and maintained by the Central Water and Power Commission, and
- (ii) the references to the Board are to the Central Board of Irrigation and Power.

It has been agreed that the Board or any of its Members as the case may be will have the following privileges and rights and the Central Water and Power Commission will have the obligations set forth in this Schedule.

1. The Library maintained by the Central Water and Power Commission will be organised on the Universal Decimal Classification System. Its aim will be to obtain and classify all useful information on irrigation, power engineering and allied science.

2. All contributing and subscribing Governments and other authorities will arrange to send to the Library in the Central Water and Power Commission, a copy of administrative reports, new technical papers, flood reports, project reports, designs of important works and type designs and legislative measures relating to irrigation, electricity, or allied subjects, issued by them or their research organisations. They will also send to the Library typescript copies of technical notes and reports of importance, as well as typescript copies of estimates and plans of new projects as soon as ready. The Library will be available to the Board and the latter may permit the issue of any paper as a general circular, which may be considered to be of sufficient importance.

3. The Chief Engineer or Chief Technical Engineering Officer of a Government, State or Union of States, or other authority contributing and subscribing to the Board, will be entitled to consult the Library on any technical subject connected with irrigation,

hydro-electric, river training or allied works, and to borrow books, publications, periodicals and maps therefrom. Such information will be sent postage free, except in the case of railway parcels.

4. A Technical Officer below the rank of Chief Engineer of a Government, State or Union of States, or other authority contributing and subscribing to the Board, may apply for information from the Library through an officer not below the rank of Superintending Engineer, on any technical subject connected with irrigation, hydro-electric, river training or allied works.

5. Any Gazetted Technical Officer of a Government, State or Union of States, or other authority contributing and subscribing to the Board, whose rank is not below that of an Executive Engineer will have the privilege of borrowing books, publications, periodicals and maps from the Library by direct application to the Secretary to the Board.

6. In the management of the Library, the Chairman, Central Water and Power Commission shall be advised by a Committee comprising:—

- (i) The Chairman, Central Water & Power Commission.
- (ii) The President or Vice-President of the Board for the time being.
- (iii) Member (D. & R.), Central Water & Power Commission (Water Wing).
- (iv) Member (Utilisation), Central Water & Power Commission (Power Wing).
- (v) Secretary, Central Board of Irrigation & Power.

7. Subject to such variation as the Library Advisory Committee may direct, the Library shall be open to all members, irrigation and other officers of contributing and subscribing Governments, States and Unions of States and authorities during such hours as may be determined by the Secretary from time to time when they shall be granted all facilities to peruse and inspect books, papers, plans, maps, etc., and to make copies or extracts therefrom (doing no injury to the same) with the exception of such documents as the Library Advisory Committee shall order not to be inspected or copied, but none of the documents of the Board and the Library shall be removed from the premises without the permission of the Secretary.

8. The Library shall be located at the same place as Central Board of Irrigation and Power and will be under the general supervision of the Secretary to the Board. In lieu of the work done by the said Secretary for the Central Water and Power Commission Library, the Assistant Secretary, Co-ordination (Central Water and Power Commission) Library will be the general assistant of the Secretary in Board matters.

---

## SECTION VI

Section VI—para. 15 (*Contributions to the Board*) is under revision and is under the consideration of the Board. The Special Committee appointed by the Board to go into this question has recommended as under:—

1. *Subscription from Irrigation*

The minimum subscription to be paid by any State would be Rs. 5,000 and the maximum Rs. 20,000. The basis of subscription would be the area irrigated and those benefited by flood control schemes. The minimum subscription would be payable up to an area of half a million acres. For every additional half million acres, the payment would be at the rate of Rs. 1,250 subject to a ceiling of Rs. 20,000.

2. *Subscription from Power*

The basis of subscription would be the net energy used within the State. A minimum of Rs. 2,500 would be payable when the energy consumed within the State is up to 100 million kWh. For every additional 100 million kWh. an additional sum of Rs. 1,000 would be payable subject to a maximum of Rs. 15,000. Contribution is to be paid on the net energy used within the State by all sources, i.e., power generated and power purchased from other States *minus* power sold out to other States in bulk.

**APPENDIX I**

**List of Films in the Library and Information Bureau**

Sl. No.	Name of Films	Film	Reels	Length	Type
1	2	3	4	5	6
(16 mm. Films)					
1.	Boulder Dam . . . . .	(F.1)	4	1,600	Sd., B&W
2.	Boulder Dam . . . . .	(F.2)	5	2,000	Sd., B&W
3.	Reclamation in the arid west . . . . .	(F.3)	1	350	Sd., B&W
4.	Fundamentals of Irrigation . . . . .	(F.4)	3	1,300	Sd., B&W
5.	Fighting Weeds . . . . .	(F.5)	3	1,050	Sd., B&W
6.	Irrigated Pastures . . . . .	(F.6)	3	1,050	Sd., B&W
7.	Measurement of Water . . . . .	(F.7)	3	1,050	Sd., B&W
8.	Coast Erosion . . . . .	(F.8)	1	250	Sd., B&W
9.	Water Power . . . . .	(F.9)	1	422	Sd., B&W
10.	A Harbour goes to France . . . . .	(F.10)	1	526	Sd., B&W
11.	Soil Erosion . . . . .	(F.11)	1	334	Sd., B&W
12.	Tube-wells . . . . .	(F.12)	1	360	Sd., B&W
13.	Bailey Bridge . . . . .	(F.13)	1	416	Sd., B&W
14.	Hydraulics . . . . .	(F.14)	2	400	Sd., B&W
15.	Irrigation Farming . . . . .	(F.15)	1	400	Sd., B&W
16.	Water Cycle . . . . .	(F.16)	1	400	Sd., B&W
17.	The Work of Running Water . . . . .	(F.17)	1	400	Sd., B&W
18.	Work of Rivers . . . . .	(F.18)	1	556	Sd., B&W
19.	Mosquito . . . . .	(F.19)	1	400	Sd., B&W
20.	Land of Five Rivers . . . . .	(F.20)	1	556	Sd., B&W
21.	The River . . . . .	(F.21)	1	1,157	Sd., B&W
22.	Terracing in the North-West . . . . .	(F.22)	1	393	Sd., B&W
23.	Flood . . . . .	(F.23)	1	287	Sd., B&W
24.	The Gates of Power . . . . .	(F.24)	1	696	Sd., B&W
25.	Operation Rock . . . . .	(F.25)	1	700	Sd., B&W
26.	Euclids Move the Earth . . . . .	(F.26)	1	—	Sd., B&W
27.	Indian News Reel No. 109 . . . . .	(F.27)	1	400	Sd., B&W
28.	Wearing Away of the Land . . . . .	(F.28)	1	400	Sd., B&W
29.	Indian News Reel No. 120 . . . . .	(F.29)	1	400	Sd., B&W
30.	Power for Tomorrow . . . . .	(F.30)	1	400	Sd., B&W
31.	Rivers in Harness . . . . .	(F.31)	1	400	Sd., B&W
32.	Hidden Hazards . . . . .	(F.32)	1	400	Sd., B&W
33.	Green Glory . . . . .	(F.34)	1	413	Sd., B&W
34.	Ground Water . . . . .	(F.35)	1	400	Sd., B&W

1	2	3	4	5	6
35.	Wet Lands . . . . .	(F.35)	I	400	Sd., B&W
36.	Soil and Water Conservation . . . . .	(F.37)	I	400	Sd., B&W
37.	Jan Gan Man . . . . .	(F.38)	I	300	Sd., B&W
38.	Jan Gan Man . . . . .	(F.39)	I	45	Sd., B&W
39.	Save the Soil . . . . .	(F.40)	I	400	Sd., B&W
40.	The Mighty Columbia River . . . . .	(F.41)	I	400	Sd., B&W
41.	The Colorado River . . . . .	(F.42)	I	400	Sd., B&W
42.	Food Facts . . . . .	(F.43)	I	400	Sd., B&W
43.	Indian Projects . . . . .	(F.44)	2	800	Sd., B&W
44.	Irrigation, brief outline . . . . .	(F.45)	I	400	Sil., B&W
45.	India Ploughs Deeper . . . . .	(F.46)	I	400	Sd., B&W
46.	Etawah Story . . . . .	(F.47)	I	400	Sd., B&W
47.	Top Soil . . . . .	(F.48)	I	400	Sd., B&W
48.	Engineering Museum . . . . .	(F.49)	I	75	Sil., B&W
49.	News items relating to various Indian Irrigation Projects . . . . .	(F.50)	I	340	Sd., B&W
50.	River of Hope . . . . .	(F.51)	I	370	Sd., B&W
51.	Projects for Plenty . . . . .	(F.52)	I	384	Sd., B&W
52.	Conveying & Measuring Irrigation Water . . . . .	(F.53)	I	400	Sd., B&W
53.	News items relating to Assam River in Spate : Godavari, Kosi Floods, Kakrapar, Koyna etc. . . . .	(F.54)	I	375	Sd., B&W
54.	Taming the Sutlej . . . . .	(F.55)	I	407	Sd., B&W
55.	Rolled Earth Dam . . . . .	(F.56)	I	1,200	Sd., Col.
56.	High Line . . . . .	(F.57)	I	700	Sd., B&W
57.	Columbia River . . . . .	(F.58)	I	700	Sd., B&W
58.	Water for a Nation . . . . .	(F.59)	I	682	Sd., B&W
59.	Corralling the Colorado . . . . .	(F.60)	I	928	Sd., B&W
60.	Ganga . . . . .	(F.61)	I	399	Sd., B&W
61.	Planned achievement . . . . .	(F.62)	I	469	Sd., B&W
62.	Energy in our Rivers . . . . .	(F.63)	I	—	Sd., B&W
63.	Valley of the Tennessee . . . . .	(F.64)	I	1,024	Sd., B&W
64.	I.N. Reels relating to various Irrigation Projects in India . . . . .	(F.65)	I	414	Sd., B&W
65.	I.N. Reels pertaining to Flood Havoc in various States in India . . . . .	(F.66)	I	371	Sd., B&W
66.	Coloured movie of the Irrigation & Power Tableau presented on the 26th Jan. Republic Day Parade 1955 . . . . .	(F.67)	I	400	Sil. Col.
67.	Indian News Reel (No. 131) showing a review of the International En- gineering Exhibition 1951 . . . . .	(F.71)	I	400	Sd., B&W
*68.	Port de mostagne prepared by the Neyrpic Laboratory, Grenoble . . . . .	(F.72)	I	—	Sd., Col.
*69.	Est. Neyrpic—showing Neyrpic La- boratory and Works . . . . .	(F.73)	I	—	Sd., Col.

\*Films thus marked cannot be loaned, being not yet censored by the Central Board of Film Censors.

1	2	3	4	5	6
70.	Waters of Coweeta issued by the U.S. Deptt. of Agriculture . . . . .	(F.74)	I	700	Sd., Col.
71.	National Library, Calcutta . . . . .	(F.75)	I	424	Sd., B&W
72.	Maps we live by . . . . .	(F.76)	I	456	Sd., B&W
73.	Shackles for the Giant . . . . .	(F.77)	I	1,200	Sd., Col.
74.	Tungabhadra . . . . .	(F.78)	I	390	Sd., B&W
75.	Fight the Floods . . . . .	(F.79)	I	387	Sd., B&W
76.	Benefits of Bhakra Nangal . . . . .	(F.80)	I	444	Sd., B&W
77.	Prestressed Concrete . . . . .	(F.81)	I	800	Sd., B&W
78.	Valley of the Giants . . . . .	(F.82)	I	1,130	Sd., Col.
79.	Visit of Marshall Bulganin to C.W.P.R. Station, Poona . . . . .	(F.83)	I	400	Sil. Col.
80.	Super-grid construction . . . . .	(F.84)	I	800	Sd., Col.
81.	Peaceful conquest . . . . .	(F.85)	I	400	Sd., B&W
*82.	Le Complexe Hydro-electrique de l'oned el Abid . . . . .	(F.86)	I	400	Sd., Col.
83.	Know your Library . . . . .	(F.87)	I	396	Sd., Col.
84.	Snowy Waters . . . . .	(F.88)	I	400	Sd., B&W
85.	Extra Dividends . . . . .	(F.89)	I	470	Sd., Col.
86.	Concrete Pipe Laying . . . . .	(F.90)	I	290	Sil. B&W
87.	Columbia Frontier . . . . .	(F.91)	I	972	Sd., Col.
88.	Construction of a 138 kV. underground transmission line . . . . .	(F.92)	I	900	Sd., Col.
89.	Steel spans the Chesapeake. . . . .	(F.93)	I	1,300	Sd., Col.
90.	Story of a Dam . . . . .	(F.94)	I	650	Sd., Col.
91.	Toe drain application of levee construction . . . . .	(F.95)	I	600	Sd., Col.
92.	Flood fight . . . . .	(F.96)	I	800	Sd., B&W
93.	Birth of an era . . . . .	(F.97)	I	972	Sd., Col.
94.	Pengoes and Pineapples . . . . .	(F.121)	I	410	Sd., Col.
95.	Hirakud Spillway model test . . . . .	(F.124)	I	500	Sil. B&W
96.	Fontana Dam . . . . .	(F.125)	I	886	—
97.	River Tamers . . . . .	(F.126)	I	1,150	—
98.	Test on Spillway models . . . . .	(F.127)	I	1,000	Sil. B&W
99.	Clean waters . . . . .	(F.130)	I	—	—
100.	Tube-well . . . . .	(F.131)	2	550	Sd., B&W
101.	Generation of Electricity . . . . .	(F.132)	I	—	Sd., B&W
102.	Transmission of Electricity . . . . .	(F.133)	I	—	Sd., B&W
103.	Capacitors . . . . .	(F.134)	I	—	Sd., B&W
104.	Standing waves on transmission lines . . . . .	(F.135)	I	—	Sd., B&W
105.	Dr. Visvesvaraya . . . . .	(F.136)	I	—	Sd., B&W
106.	Oklahoma . . . . .	(F.137)	I	—	Sd., B&W
107.	Irrigation to make the desert bloom . . . . .	(F.138)	I	—	Sd., B&W
*108.	Vibration tests] . . . . .	(F.139)	I	—	Sd., B&W
109.	Hirakud . . . . .	(F.140)	I	—	Sd., B&W
110.	Kakrapar . . . . .	(F.141)	I	—	Sd., B&W
111.	Plus Electrification . . . . .	(F.142)	6	—	Sd., Col.

\*Films thus marked cannot be loaned, being not yet censored by the Central Board of Film Censors.

1	2	3	4	5	6
(35 mm. Films)					
1.	Rural electrification (Russian)	(F.99-103)	5	—	—
*2.	Construction on a power house on Don Volga Canal (Russian)	(F.104-120)	17	—	—
3.	4,00,000 Volts (French)	(F.122)	2	₹1,802	—
4.	Barrage de Girofle	(F.123)	1	1,135	—
*5.	Snow Survey of Kosi	(F.128)	1	—	—
*6.	Snow view	(F.129)	1	—	—

\*Films thus marked cannot be loaned, being not yet censored by the Central Board of Film Censors.

## APPENDIX II

### Annual Reports

Sl. No.	Pubn. No.	Name of Publication
1.	*11	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1934-35.
2.	*14	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1935-36.
3.	*16	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1936-37.
4.	*19	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1937-38.
5.	*22	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1938-39.
6.	*24	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1939-40.
7.	*27	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1941.
8.	*29	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1942.
9.	*31	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1943.
10.	*33	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1944.
11.	*35	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1945.
12.	38	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1946.
13.	40	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1947.
14.	*47	Annual Report (Tech.), of the work of the Central Board of Irrigation, India, 1948.
15.	*49	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1949.
16.	*50	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1950.
17.	52	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1951.
18.	56	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1952.
19.	57	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1953.

\*Out of stock



Sl. No.	Pubn. No.	Name of Publication
20.	62	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1954.
21.	63	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1955.
22.	64	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1956.
23.	66	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1957.
24.	68	Annual Report (Tech.), of the work of the Central Board of Irrigation and Power, India, 1958.
<b>Technical Publications</b>		
1.	*1	Digest of Technical Notes, 1931 (R-print). A summary of views of Chief Engineers on the following subjects :— <ul style="list-style-type: none"> <li>(i) Water-logging and Reclamation.</li> <li>(ii) Effect of deforestation and afforestation on river floods.</li> <li>(iii) Design of works on sand foundations.</li> <li>(iv) Fluming of canal works.</li> <li>(v) Regulation of canal headworks.</li> <li>(vi) Design of canal falls.</li> </ul>
2.	*2	Digest of Technical Notes, 1932. A summary of views of Chief Engineers on the following subjects :— <ul style="list-style-type: none"> <li>(i) Water-logging.</li> <li>(ii) Design of works on sand foundations.</li> <li>(iii) Design of canal falls.</li> <li>(iv) Stauching of canals.</li> </ul>
3.	*3.	Catalogue of books (up to December 1933) in the Library of Central Board of Irrigation and Power, New Delhi and its 1st and 2nd Annual Supplements (1935 & 1936).
4.	4	Hydraulic Diagrams: Energy of flow, Pressure-plus-momentum Diagrams for the simple graphic solution of problems involving a change of section in stream of water (Compiled by Mr. A.M.R. Montagu, M.I.C.E., etc., (1934). Enlarged Edition 1949 by Shri N. D. Gulhati, I.S.E., M.I.E., (India).
5.	*5	Glossary of Technical and Vernacular Terms in connection with Irrigation in India together with Standard Notations (1934).
6.	5	Glossary of Technical and Vernacular Terms in connection with Irrigation in India, together with Standard Notations (1934), First, Revised Edition 1941.
7.	5	Glossary of Irrigation and Hydro-electric Terms and Standard Notations used in India—Third Edition.
8.	*6	Fluming: A series of examples illustrating the use of Hydraulic Diagrams, C.B.I., Pubn. No. 4, by Mr. A.M.R. Montagu, M.I.C.E., etc., (1934)
	6	Fluming: 1st Revised Edition—1957.
9.	*7	The Standing Wave or Hydraulic Jump (1934).
10.	7	The Standing Wave or Hydraulic Jump (1934), Second Edition (Revised and Enlarged) 1950.

\* Out of stock

Sl. No.	Pubn. No.	Name of Publication
11.	*8	Observation and record of Pressures below works on Permeable Foundations by R. B. A. N. Khosla (1935).
12.	*9	Stabilization of Soils by the use of Bitumen Emulsion by Brig. C. H. Haswell (1935).
13.	*10	Irrigation Canal Falls [Compiled by Mr. A.M.R. Montagu, M.I.C.E. etc., (1935)].
14.	*12	Design of Weirs on Permeable Foundations by R.B. A.N. Khosla, Dr. Nalini Kante Bose and Dr. E. Mckenzie Taylor (1936).
	12	(Reprint 1956.)
15.	17	Notes on Water-logging and Land Reclamation in the form of Questionnaire (1938).
16.	20	Regime flow in Incoherent Alluvium by Mr. Gerald Lacey (1939).
17.	*26	Water weeds and their Eradication from canals by M/s. C. C. Inglis and V.K. Gokhale with a note of Eradication of Bulrush by M/s. V.K. Gokhale and S. N. Punekar (1941).
18.	36	Role of glaciers and snow on the Hydrology of Punjab Rivers by R. B. Kanwar Sain.
19.	41	Resolutions and Recommendations of the Central Board of Irrigation (Technical) (1931-1947).
20.	42	Standards for testing Soils (Tentative).
21.	43	Land Reclamation by Shri M.L. Mehta, Vol. I. Land Reclamation by Dr. R.C. Hoon, Vol. II.
22.	*45	Central Board of Irrigation Library Manual.
23.	48	Data of High Dams in India (Vol. I and II).
24.	51	Silting of Reservoirs by Shri A. N. Khosla.
25.	*53	Symposium of Role of Models in the Evolution of Hydraulic Structures and Movement of sediment held in November, 1952.
26.	*54	Symposium of Determination of Costs and Benefits of River Valley Projects held in October, 1953.
27.	55	The application of Electrical Analogy to the design of Hydraulic Structures by Dr. V. I. Vaidyanathan.
28.	58	Investigation Manual of Storage Reservoirs.
29.	59	Design of Syphons.
30.	60	Manual of River Behaviour, Control and Training.
31.	61	Symposium on Nation Wide Survey of Irrigation and Power Projects for working out long-term programme of development.
32.	65	Symposium on Spillway Capacity of Dams.
33.	68	Catalogue of Books, Library and Information Bureau, Vol. I.
34.	—	Technical Memorandum No. 1—Impression of a Study Tour in California during the International Conferences on Irrigation and Drainage held at San Francisco, May 1957.
35.	69	Tube-well and Ground Water Resources.
36.	70	Symposium on Energy Dissipators.
37.	—	Technical Memorandum No. 2—Technological Development Abroad.

\* Out of stock

### Other Publications

1. Central Board of Irrigation Bulletin, issued from January, 1936 to September, 1943 (Discontinued after September, 1943 and then monthly abstracts and quarterly Journal started).
2. Central Board of Irrigation and Power abstracts—Issued monthly since October, 1943.
3. (a) Central Board of Irrigation and Power Journal—Issued quarterly since October, 1943.  
(b) Central Board of Irrigation & Power Journal—Issued monthly since January, 1961.

### Popular Series Leaflets and other Pamphlets

- Leaflet No. 1 Irrigation in India, 1947.
- Leaflet No. 2 Irrigation Research in India—\*1st Edition, 1947 and 2nd Edition, 1951.
- Leaflet No. 3 New Projects for Irrigation and Power, 1st Edition, 1947, 2nd Edition, 1948, \*Third Edition, 1950, and 4th (Revised) Edition, 1954.
- Leaflet No. 3 New Projects for Irrigation and Power, Hindi Edition, 1949 and Revised Edition, 1954.
- Leaflet No. 4 Waterway of India, 1947.
- Leaflet No. 5 Hydro-electric Development in India—1st Edition, 1948, 2nd Edition, 1950 and Third Edition, 1956.
- Leaflet No. 5 Hydro-electric Development in India—1st Edition, 1948, 2nd Edition, 1950 and 3rd Edition, 1956 (All Hindi Editions).
- Leaflet No. 6 Engineering Organisations and Societies in India, 1951.
- Leaflet No. 7 Irrigation in India through Ages—1951, Second Edition, 1953.
- Leaflet No. 7 Irrigation in India through Ages—1954 (Hindi Edition).
- Leaflet No. \*8 International Engineering Conference and Exhibition, India, 1951—Some Impressions.
- Leaflet No. \*9 Library and Information Bureau.
- Leaflet No. 10 Silver Jubilee of the Central Board of Irrigation and Power.
- Leaflet No. 11 Glossary of Technical Terms in daily use (for the Layman).
- Research Pamphlet 1954—Irrigation Research in India, 1953.  
River Behaviour, Control and Training (Synopsis).
- Research Pamphlet 1955—Irrigation Research in India, 1954.
- Research Pamphlet 1956—Irrigation Research in India, 1955.
- Research Pamphlet 1957—Irrigation Research in India, 1956.
- Research Pamphlet 1958—Irrigation & Powers Research in India, 1957.
- Research Pamphlet 1959—Irrigation & Powers Research in India, 1958.
- Research Pamphlet 1960—Irrigation & Powers Research in India, 1959.