

Engineering Organisations  
and Societies in India.

**E** **ENGINEERING**  
**ORGANISATIONS**  
**AND**  
**SOCIETIES**  
**IN INDIA**



**CENTRAL BOARD OF IRRIGATION**

**POPULAR SERIES**

**LEAFLET NO 6**

## FOREWORD

This leaflet is Sixth of the Popular Series and has been brought out especially for the information of delegates from home and abroad attending the International Engineering Conferences being held in India in January 1951. Only the general set up and main activities of different organizations have been described; more complete information about any organization can be obtained direct from the organization concerned.

The Board is indebted to all those who have supplied information regarding their activities and have co-operated in the preparation of this leaflet. It is possible that information about some organizations may have been inadvertently left out. The undersigned would be grateful if such organizations will supply to the undersigned details about their activities and work, for inclusion in subsequent editions of this leaflet.

S. L. MALHOTRA,  
*Secretary.*

KENNEDY HOUSE :  
*Simla-4, the 20th October, 1950.*

# ENGINEERING ORGANISATIONS AND SOCIETIES IN INDIA

## INTRODUCTION

Engineering, as an essential Science, can be traced to the most primitive age when the first human being built his hut to take shelter from rains and sun. This Science has continually advanced since then and the engineers of different ages have successively contributed in a great measure to promote its advancement, with the result that today we find efficient organisations in every country actively engaged in one or another sphere of engineering. In fact the role of engineers has become more and more important, be it for house construction, sanitation, water supply, running a factory, new inventions in machinery, irrigation, navigation, electric supply system and in short, what not. The World War caused immense devastation and the backward countries especially depend entirely on their engineering organisations for revival, the engineers and engineering organizations of these countries having a very big responsibility on their shoulders. There is, no doubt, that the engineering profession will rise to the occasion as is evident from the progress in post-war reconstruction all the world over. It will be interesting to know the set up of various engineering organisations in any country and their activities. This leaflet is an attempt to acquaint the reader of such organisations in India.

## STATE-MANAGED ORGANISATIONS

In India, before 1854, all public works, except railways, were carried out by the Engineering Department of the Army under the superintendence of a military board. The successful construction of the two classic irrigation works in India viz., the Upper Ganga Canal and the Godavari Delta systems towards the middle of the nineteenth century are due to the great enterprises of the military engineers. With the increase in activities in various phases of state development, it was felt essential to create separate organisations to deal with each development and there are at present separate State Departments for Public Works, Military Engineering, Railway Engineering etc.

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## PUBLIC WORKS DEPARTMENT

The Public Works Department is responsible for the maintenance, design and execution of projects relating to irrigation, electricity, buildings and roads and public health.

### IRRIGATION

Irrigation is completely under the control of the State Governments and at present every administrative unit is competent to utilize in whatever way it lies, the waters which run through its territories though claims of adjoining concerned States are kept in view. In all states of India except Assam, Kashmir, Saurashtra, Vindhya Pradesh, Union of Travancore and Cochin and Bhopal there are distinct and separate departments to deal with irrigation. In these departments the unit of management is the Division, under an Executive Engineer. This is sub-divided into sub-divisions, under a sub-divisional officer who is responsible to the Executive Engineer for the efficient and proper working of his sub-division. A number of divisions, usually three to six, form a circle under the administrative control of a Superintending Engineer and the head of all is the Chief Engineer, of whom there may be one or more in each State according to the extent of the irrigation works. In addition, some administrations have their separate design offices and irrigation research stations to design and deal with the day to day problems in connection with the maintenance and improvements of existing projects and execution of new projects. There are at present eight irrigation research stations, viz., Punjab Irrigation Research Institute (Punjab I), Uttar Pradesh Research Circle (Uttar Pradesh), River Research Institute West Bengal, Irrigation Research Station and Soil Mechanics and Concrete Laboratories (Madras), Hydraulic Research Station, Krishnarajasagar (Mysore), Hyderabad Engineering Research Laboratories (Hyderabad), Poona Irrigation and Research Division (Bombay) and Central Waterpower, Irrigation and Navigation Research Station (Government of India). A comprehensive description of the research activities of these stations will be found in Leaflet No. 2 of this series.

With the setting up of the Central Waterpower, Irrigation and Navigation Commission and with the passing of the Waterways Act, which is at present under the active consideration of the Government of India, every State will be required to submit all the schemes relating to rivers which lie in more than one administration, for examination by a Central Authority, which will ensure that development in all units fits in with the regional development of a particular river system.

In addition to the engineering departments of the States there are the following organizations worth mentioning :—

- (1) Central Board of Irrigation.
- (2) Central Water-Power Irrigation and Navigation Commission.
- (3) Damodar Valley Corporation.

A brief description of these is given below :—

### **CENTRAL BOARD OF IRRIGATION**

Set up in 1931, the Central Board of Irrigation consists of Irrigation and Hydro-electric Chief Engineers of all administrations in India. In addition Ceylon and Burma are also members of the Board. The functions of the Board are, (1) to establish contacts with institutions and individuals in India and abroad with a view to the exchange of publications and technical information, (2) to collect and supply information on irrigation, hydro-electric and allied subjects, (3) to coordinate research on irrigation, hydro-electric and allied subjects and to disseminate results of such research, (4) to contribute information on Irrigation, Hydro-electric and allied subjects for publication in the press and (5) to publish relevant literature.

Meetings of the Research Committee set up by the Board and the Board are held annually where research carried out during each year and other technical papers and problems are discussed and suitable recommendations on different subjects made to the various Governments in India. The papers, extract of research reports of the Irrigation Research Stations and discussions are published in the Annual Report (Tech.) of the Board. In addition the Board publishes a two-monthly Journal, Monthly Abstracts of the literature received in the Library, Popular Series Leaflets and special publications on various technical subjects.

The Board maintains one of the finest libraries on Irrigation, Hydro-electric and Allied subjects in India, where enquiries from engineers in India and abroad are dealt with.

The Board is also the National Committee in India for the International Commission on Large Dams and the International Commission on Irrigation and Canals. It is also a Liaison Body in India for the International Association for Hydraulic Research.

As its function include hydro-electricity, its name is being changed to Central Board of Irrigation and Power.

The Secretariat of the Board is under the charge of a Secretary and the office is at present located in the Kennedy House, Simla.

### **CENTRAL WATERPOWER, IRRIGATION AND NAVIGATION COMMISSION**

The Central Waterways, Irrigation and Navigation Commission generally known as CWINC was first constituted in April, 1945 and later in January 1948 was reconstituted as Central Waterpower, Irrigation and Navigation Commission to perform the following main functions :—

1. To make necessary investigations and prepare schemes and designs for the development of river valleys in respect of hydro-electric power generation, irrigation, navigation, flood control, soil conservation etc., on an All-India basis.

2. To undertake construction work on any river development schemes on behalf of the Government of India and States.
3. To advise and assist if so required, the State Governments in the investigation and preparation of river valley development schemes.
4. To advise the Government of India in respect of water and waterpower rights and disputes as between various States.
5. To initiate schemes and arrange for the training of Indian engineers in India and abroad, in the many aspects of river valley development.
6. To conduct and co-ordinate research on the various aspects of river valley development schemes.
7. To collect, co-ordinate the collection of, publish and analyse data relating to water-power, waterways, rainfall, runoff, silting of reservoirs etc., and to act as the Central Bureau of information in respect of these matters.

The Commission is a strong technical organisation and consists of a Chairman and three full-time Members. The Commission has the necessary technical and administrative staff and specialists to carry out its duties.

The technical work of the Commission is at present divided into nine branches each branch specialising in its own subject and working in full co-ordination and collaboration with other branches.

The nine branches are, Irrigation, Hydro-electricity, Navigation, Waterways, Hydrology, Designs, Research, Construction (including Stores and Equipment) and Statistics and Publications.

The Central Waterpower, Irrigation and Navigation Research Station at Poona carries out model experiments and research on various aspects of water utilization.

The CWINC maintains one of the finest libraries on irrigation, hydro-electric and allied subjects where inquiries from Engineers in India and abroad are dealt with through the Central Board of Irrigation.

A Central Design Organisation has recently been set up to carry out all designs works for the projects under construction and also to assist the States in the preparation of the designs relating to other river valley projects.

During the past few years the CWINC has been giving technical advice to various State Governments on problems relating to river valley development. It has taken in hand the formulation and preparation of a number of projects such as (1) Hirakud Dam Project in Orissa, (2) Kakrapar Dam Project in Bombay, (3) Kosi Dam Project in Bihar, (4) Narbada River Valley Development Projects in Bombay and Madhya Pradesh, (5) Assam Projects, (6) Coorg Projects, (7) Madhya Pradesh Projects, (8) Ganga Barrage Project in West Bengal, (9) Sabarmati River Valley Project in Bombay and (10) Kantli Project in Rajasthan.

Among these, construction work had already commenced on Hirakud Dam and Kakrapar Dam Projects. The investigations on Kosi Dam Project are approaching the final stage. These three projects among themselves will make possible irrigation for about 3,660,000 acres besides power generation to the extent of 411,000 kW.

### **DAMODAR VALLEY CORPORATION**

The Damodar Valley Corporation was set up by an Act passed by the Indian Dominion Legislature in 1948 for the development of the Damodar Valley in the States of Bihar and West Bengal. The functions of the Corporation are :

- (a) the promotion and operation of schemes for irrigation, water supply and drainage,
- (b) the promotion and operation of schemes for the generation, transmission and distribution of electrical energy, both hydro-electric and thermal,
- (c) the promotion and operation of schemes for flood control in the Damodar river and its tributaries and the channels, if any, excavated by the Corporation in connection with the scheme and for the improvement of flow conditions in the Hoogly river,
- (d) the promotion and control of navigation in the Damodar river and its tributaries and channels, if any,
- (e) the promotion of afforestation and control of soil erosion in the Damodar Valley, and
- (f) the promotion of public health and the agricultural, industrial, economic and general well-being in the Damodar Valley and its area of operation.

The D.V.C. is an autonomous body similar to T.V.A. and is now actively engaged on the construction of dams and barrages of the Damodar Valley Project.

### **ELECTRICITY**

Electricity like irrigation has been hitherto a State subject and each administration unit was competent to deal with it. In addition there are some private organisations like the Tata's Hydro-electric concerns, and Gokak Falls concerns which have developed power. The administrative set up of electricity departments in the States is similar to irrigation. There are at present separate Chief Engineers for electricity in Punjab, Bombay, Bihar, Orissa, Madras, Madhya Pradesh, Hyderabad, Mysore, Kashmir, and Union of Travancore and Cochin.

The Government of India under the Electricity Act 1945 have constituted a Central Electricity Authority which will develop a sound, adequate and uniform national power policy and particularly co-ordinate the activities of the planning agencies in relation to



the control and utilisation of national power resources. Under the Act the State Governments are required to set up State Electricity Boards who will be charged with the general duty of promoting the co-ordinated development of the generation, supply and distribution of electricity within the State in the most-efficient manner. In addition there are the CWINC (already described) and Central Electricity Commission, two strong technical organisations at the Centre.

### **CENTRAL ELECTRICITY COMMISSION**

The Central Electricity Commission is a technical organization working under the Ministry of Works, Mines and Power and was formed in January, 1948 to replace two other offices existing at that time, viz., the office of the Electrical Commissioner with the Government of India and the Office of the Central Technical Power Board.

The Commission is charged with the general responsibility for co-ordinating and furthering all schemes of electric power development, transmission and utilization throughout the country in consultation with the State Governments concerned. The Commission renders expert advice to the Central and State Governments on the administration of electricity legislation and control of electric utilities; collects, maintains and publishes statistical data relating to the generation, distribution and utilization of electricity throughout the Republic of India and thus acts as the central bureau of information on all matters relating to the public electricity supply; assists the Central and State Governments in regard to investigation, survey and preparation of schemes of power development for particular areas and regions and undertakes detailed designing of transmission, switching, layouts and Power Stations and execution of the projects whenever called upon to do so; assists Central and State Governments in the surveying of potential sources of load, the forecasting of revenue from electricity supply, formulation of electricity tariffs and general planning for utilization of power; co-operates with the Central Waterpower, Irrigation and Navigation Commission in the preparation of plans and designs for transmission, switching and utilization of electricity in hydro-electric projects prepared by that body. In addition to the above it will, from time to time review and lay down for the whole of India standard voltages and practices for generation, transmission and distribution of electrical energy; will conduct experiments, researches, and propaganda towards promoting the spread and use of electricity throughout the country and in particular in the semi-urban and rural areas.

Prior to the formation of the Central Electricity Commission, the Electrical Commissioner with the Government of India had been publishing the annual All India Statistics for public Electricity Supply since 1939, and the Central Technical Power Board had prepared several project reports including the one on the unified Development of the Damodar River, and nursery power schemes in a few states. The work of these two bodies is now being continued by the Commission. The detailed designing of the Damodar Power System, drafting specifications and advising the Damodar Valley Corporation on the ordering of the necessary materials is a major job now in hand with the Commission.

According to its constitution, the Central Electricity Commission will consist of a Chairman, two full-time Members and in addition, such number of part time and *ex-officio* Members as Government may from time to time find necessary.

The Office is at present located in 'Cleremont', Simla-4.

### **P.W.D. BUILDINGS AND ROADS BRANCH**

The set up of administration for the Buildings and Roads Branch is similar to Irrigation Departments. In addition there are, the Central Public Works Department and Roads Organisation of the Ministry of Transport. The Indian Roads Congress which is a private organisation helps in promoting and encouraging the science and practice of building and maintenance of roads. The Corporation, Municipalities and District Boards have their separate engineering organisations for the construction and maintenance of roads, buildings etc., which are within their jurisdictions.

### **CENTRAL PUBLIC WORKS DEPARTMENT**

The Central Public Works Department is the sole agency for execution of all civil works concerning buildings, roads, sanitation, water supply, horticulture and civil aerodromes for the Government of India in all the States. Apart from a very large volume of work in connection with the maintenance of Central Government property all over India, the Department is often called upon to plan, design and execute works of varied nature, such as bridges, factories, mints, telephone exchanges, and improvements to aerodromes in order to bring them up to International standards.

The Central Public Works Department is divided into two main wings, one is the 'General Wing' and the other is called the 'Civil Aviation Wing', each under the charge of a Chief Engineer. The 'general' side of the Department is further divided into two Zones, i.e., 'Western' and 'Eastern', the former under the charge of a Chief Engineer and the latter under the charge of an Additional Chief Engineer.

The 'Civil Aviation Wing' of the Central Public Works Department was established in May 1946 when it was felt that, in view of the increasing technical specialisation in the construction of aerodromes, it was necessary to have a separate Wing of the Central Public Works Department for executing civil aviation works only.

The Department has got an Architectural branch which consists of one consulting architect, one town planner, six senior architects and a good number of junior and assistant architects. This branch deals with the designs of all important Government buildings as well as their layouts.

There is also a Planning Circle which was set up in 1948 in order to prepare projects in full detail in advance so that very little in this direction is left to the engineer-in-charge of the execution of works.

The Central Public Works Department works as one team, in which, the architect, town planner, civil engineer, electrical engineer, sanitary engineer, horticulturist, air conditioning engineer, decorator and the furnisher, all play their part. The Chief Engineer co-ordinates the activities of the different branches. In the initial stages, each large project is considered by the Chief Engineer who puts the various parts of the P.W.D. machine in motion. The present happy relationship between different branches, as is obtainable in the Central P.W.D., is an ideal which every State should try to achieve.

## **ROADS ORGANIZATION OF THE MINISTRY OF TRANSPORT**

This Organisation was first created in 1930 as the Office of the Special Chief Engineer, afterwards Consulting Engineer to the Government of India (Roads), with a small staff to administer the newly constituted Central Road Fund and to advise the Government of India generally in all matters concerning roads and road development. It was slightly expanded in 1935 and again during World War II.

The realisation that a balanced road system was a vital prerequisite to the post-war economic development of the country impelled the Central Government to convene (at Nagpur in December 1943) a conference of all the State Chief Engineers to make proposals for the comprehensive plan of road development for India. Their report (commonly known as the Nagpur Plan) represents the first comprehensive Road Plan for India.

In the process of implementation of the various recommendations in this plan and as a result of the Central Government assuming complete financial liability for the maintenance and development of a system of roads accepted by them as National Highways, the Office of the Consulting Engineer to the Government of India (Roads) has been expanded considerably during the last five years and is now known as the Roads Organisation of the Ministry of Transport.

### **4. The main functions of the Roads Organisation are :—**

- (i) to administer the Central Road Fund and distribute it equitably to the various States for works approved by the Government of India.
- (ii) to regulate the construction and maintenance of National Highways and to provide funds for this.
- (iii) to secure balanced development of roads and road transport and to co-ordinate with other systems of transport, principally railways and motor transport.
- (iv) to collect, compile, analyse, and interpret road statistics covering all aspects of road development.
- (v) to draw up Standard Specifications and Designs for bridges and roads, both for National Highways and State roads, taking into account the traffic trends in the next 20 years.

- (vi) to foster road research by the setting up of a Central Road Research Institute, and to co-ordinate and disseminate the results of road research work done by the various authorities and administrations in India.
- (vii) to improve the technical knowledge and experience of the highway engineering personnel by sponsoring the training of engineers in India and abroad, by disseminating information on standards and modern engineering techniques, and by encouraging the study of road economics and administration.
- (viii) to advise the State Governments in the procurement and the use of road-making machinery, including the fostering of their manufacture, especially of road rollers in this country. Bulk procurement of road rollers for the immediate requirements is also secured.
- (ix) to arrange for the priority and procurement of road making materials in short supply such as steel, cement, and bitumen and to assist in securing priority transport.
- (x) to advise other Central Government Ministries (Defence, States, External Affairs etc.) on all matters concerning roads and road transport and to advise similarly the State Governments.
- (xi) to function generally as a repository of technical, statistical, and administrative information on all matters concerning roads and road development.

The Government of India have used the Indian Roads Congress as an agency for attaining many of these objects.

### **INDIAN ROADS CONGRESS**

Constituted in December 1934 with the main object of promoting and encouraging the science and practice of building and maintaining roads and providing a channel for the expression of the collective opinion of India's highway engineers on matters affecting roads, the Indian Roads Congress has a membership of about 1,400 (June 1950) including members residing in the U.S.A., England, Scotland, Ireland, British West Indies, Canada, Pakistan, Ceylon and Burma.

The Congress meets annually at general sessions which are usually attended by 200 or more delegates from all over India. The technical activities of the Congress are mainly carried out through its several committees and sub-committees which meet at the general sessions and, if possible, at other times during the year. The more important committees are, the Specifications and Standards Committee, the Bridges Committee (this Committee drafted a Standard Specifications and Code of Practice for Road bridges), the Technical Sub-committee which directs the tests carried out on the Test Track at Calcutta and deals with road research generally and the Soil Research Sub-committee. Other sub-committees deal with the education of the highway engineer, road and road transport problems, the architectural layout of highways, the manufacture of road making machinery, the mechanisation of road-building

operations, and the bituminous treatment of wet aggregates. The Council, which is the governing body of the Congress, considers all the suggestions, received at the general sessions or from the committees and makes suitable recommendations to the Central or the State Governments.

The Congress issues two regular publications, viz., its "Journal" and the "Transport-Communications Monthly Review". The Journal is quarterly, containing technical papers, discussions and research reports. In addition the Congress issues occasional bulletins on matters of highway interest.

The Congress maintains an engineering library with an emphasis on highways, bridges and transport. Information on highway problems is supplied in reply to queries received from Members and other engineers.

The Secretariat of the Congress is in the charge of a Secretary and the Office is located in the Jamnagar House, Shahjahan Road, New Delhi.

## **PUBLIC HEALTH**

In some States there are separate departments to deal with the public health works while in others this work is also being done by the Buildings and Road Departments.

## **RAILWAY ENGINEERING**

The vast net work of railways in India now comprises 20,686 miles broad-gauge, 16,004 meter gauge and 3,827 miles narrow gauge routes. The construction of railways dates back to 1845, but railway building on an extensive scale was taken up in 1853. All these works continued to be constructed and operated by different companies. It was later on found essential in the interest of the country that the control of railways should vest with the Government. The Chief Railways in India are Bengal-Assam, Bengal-Nagpur, Bombay, Baroda and Central India, East-Indian Railway, Madras and Southern Mahratta Railway, Great Indian Peninsula Railway, East Punjab Railway, South-India Railway, Oudh-Tirhut Railway, Jodhpur, Bikaner, Mysore and Hyderabad Railways. Each of these railways have their separate mechanical and civil engineering departments under a Chief Engineer. The Railway Board is the central organisation for controlling and co-ordinating the entire activities of the railways in India.

### **RAILWAY BOARD—CENTRAL STANDARD OFFICE**

The Central Standards Office for Railways was set up in 1929-30, temporarily for five years, to co-ordinate the work of various Railway Standards Committees, which had been already functioning for several years. Its principal aim was to provide for the progressive standardization of rolling stock, track, bridges, structures and all equipment commonly used on Indian Railways, in accordance with changing conditions and as a result of practical experience.

Previous to 1929, the work of preparing standard designs, drawings and specifications was dealt with, on behalf of the Railway Board, by a firm of Consulting Engineers, by officers on special duty, and by various Railway Administrations. In 1935, the C.S.O. was put on a permanent footing. The permanent organization of the office consists of a Chief Controller of Standardization, assisted by selected deputies and assistant chief controllers and research officers, who specialise in civil or mechanical design and research work, including electrical, metallurgical and chemical research. There are several Standards Committees, functioning under the control of the C.S.O. in an advisory capacity. These committees are composed of senior officers from the Mechanical, Civil and Stores Departments of Railway Administrations in India and meet at least once a year for deliberations on the various railway engineering design and research problems.

**Drawings & Specifications.**—The C.S.O. is responsible for the preparation of and supply to Indian Railways, standard drawings and specifications for all equipment and material used by railways in India—covering locomotives, carriages and wagons, track, signalling and interlocking, bridges, structures, buildings, etc. These designs and specifications embody the most up-to-date features, based on the results of experience and research in this and other countries, and are aimed at effecting the maximum economy and efficiency in service.

The Indian Railway Standard designs and specifications are subjected to progressive rationalisation and revision, as dictated by advances in engineering and scientific practices.

This office has so far issued 7,300 standard drawings, 160 IRS specifications and 10 Codes of Practices. Besides this, the reports of the technical Standards Committees, containing a large amount of useful technical data, are printed and issued for the information and guidance of railway engineers. The reports on research work are also circulated to railways.

The C.S.O. is responsible for conducting research in connection with mechanical, civil and electrical engineering, metallurgical and chemical fuel and housing problems of railways. It has a nucleus research organization attached to it, including a Research Station at Shakurbasti near Delhi, with a small workshop, laboratory and test track. A dynamometer car, an oscillograph car and a fuel test car are also available. The research equipment is being gradually expanded.

This organization also co-ordinates the research work, initiated by individual railways, the Railway Board or the various Standards Committees.

Research Projects undertaken so far by the Research Section of C.S.O. include, among others, investigations into track strength and characteristics, the riding qualities of locomotives, impact tests on wagons and coaching stock, the resistance of rolling stock, the use of non-coking and lower grade coals, improvements in locomotive valve gears. devices to reduce fuel consumption and the collection

of data for the scientific design of rolling stock and track to meet future requirements. Research on housing problems and soil mechanics, though recently started, is expected to make a substantial contribution to the technical advancement of Indian Railways.

Close liaison with Indian Universities, Research Institutes, Railway laboratories, scientific and industrial institutions and foreign technical and scientific bodies is maintained for mutual benefit and to avoid unnecessary duplication of research activities.

**Advisory functions.**—The C.S.O. has gradually been assuming the full functions of advisers and consulting engineers to the Railway Board and the Railways in all technical matters.

The activities of C.S.O. in this direction are at present confined to the inspection of locomotive boilers, which are being manufactured by Messrs. Tata Locomotive & Engineering Co., Tatanagar. The establishment of Locomotive Manufacturing Works in India has necessitated the extension of these activities.

The C.S.O. maintains a small technical reference library for the mechanical, civil and research branches. Today it houses 1,300 books and 600 catalogues.

This office also maintains a watch on the grant of patents with a view to safeguarding the interests of Indian Railways.

### **CORPS OF ENGINEERS**

The Corps of Engineers was raised in about 1780 and is based on three groups, the Madras, Bengal and Bombay Engineer Groups, located at Bangalore, Roorkee and Kirkee (near Poona) respectively.

The head of the Corps is the Engineer-in-Chief whose headquarters are at Kashmir House, New Delhi.

The activities of the Corps include engineering works services, survey and transportation. The Military Engineer Service is responsible for the design and construction of buildings, roads, docks, air-fields, electrical and water supply and other installations required by the armed forces. The control of these works is exercised by three Chief Engineers in each military Command; they are also responsible for the technical efficiency and training of all engineer troops located in their commands. The Corps has in the past been responsible for the construction of many works of national importance and is at present engaged on certain major civil projects. The Survey of India which is a civil department of the Government of India is also partly officered by Corps of Engineer officers.

The specialised training of the officers is carried out at the School of Military Engineering at Kirkee.

The Corps has an institution called the Institution of Military Engineers, the objects of which are to promote study and propagation of all military engineering subjects.

There is in addition a small Engineer Research Station at Kirkee which deals with research and development problems of military engineers.

## **RESEARCH & DEVELOPMENT—CIVIL AVIATION DEPARTMENT**

The Research and Development Branch was organised in April, 1946 in accordance with the post-war reconstruction plans of this Department.

The activities of the Branch include investigation of scientific and technical problems relating to airworthiness and safety in operations, design approval of civil prototype aircraft for issue of airworthiness certificate, co-ordination of development of aircraft materials of indigenous origin and their standardisation, the promotion of development work on gliders, sailplanes and light aircraft and in general the study of current developments in aviation technology and their application to civil aircraft operations in India.

A Technical Development and Co-ordination Centre providing research and test facilities has recently been established to facilitate the Research and Development Branch in performing its functions effectively. It is proposed to build up an up-to-date library of aeronautical standards and specifications and of technical data relating to aircraft and operations.

Technical notes, bulletins and data sheets are published from time to time by the Branch.

## **PLANNING COMMISSION**

After the end of war in 1945, all the States in India initiated a large number of development projects, experience regarding which has shown that progress has been hampered by the absence of adequate co-ordination and of sufficiently precise information about the availability of resources. The need for comprehensive planning based on a careful appraisal of resources and on an objective analysis of all the relevant economic factors had become imperative. With a view to speedy execution of the various development projects, the Government of India have recently set up a Planning Commission whose functions will be :

- (1) to make an assessment of the material, capital and human resources of the country, including technical personnel, and investigate the possibilities of augmenting such of these resources as are found to be deficient in relation to the nation's requirements ;
- (2) to formulate a Plan for the most effective and balanced utilisation of the country's resources ;
- (3) to determine priorities, define the stages in which the Plan should be carried out and propose the allocation of resources for the due completion of each stage ;
- (4) to indicate the factors which are tending to retard economic development, and determine the conditions which in view of the current social and political situation, should be established for the successful execution of the Plan ;



- (5) to determine the nature of the machinery which will be necessary for securing the successful implementation of each stage of the Plan in all its aspects ;
- (6) to appraise from time to time the progress achieved in the execution of each stage of the plan and recommend the adjustments of policy and measures that such appraisal may show to be necessary ; and
- (7) to make such interim or ancillary recommendation as appear to it to be appropriate either for facilitating the discharge of the duties assigned to it, or on a consideration of the prevailing economic conditions, current policies, measures and development programmes, or on an examination of such specific problems as may be referred to it for advice by Central or State Governments.

The Planning Commission comprises a Chairman, a Deputy Chairman, four Members, a Secretary and adequate administrative and other staff.

## PORTS

The Port Trusts in India have their adequate engineering organisations in charge of engineering activities relating to ports. The important port trusts in India are Bombay, Calcutta and Madras.

## INSTITUTIONS AND SOCIETIES

### INSTITUTION OF ENGINEERS (INDIA)

Established in 1920 and incorporated by Royal Charter in 1935 with a membership of over 6,000 at present, the Institution of Engineers (India) was brought into being for the purpose of bringing together all qualified professional engineers to promote the general advancement of engineering and engineering services in India and to facilitate the spread of information and ideas on engineering subjects and to diffuse among its members information on all matters affecting engineering, to pool their knowledge and utilise it to the best advantage of the profession and also to encourage, regulate and elevate the technical and general knowledge of persons engaged in engineering. The Institution carries on its activities through the medium of 12 Local Centres in India and Pakistan and a committee in England, the headquarters being at Calcutta, Bombay, New Delhi, Simla, Lucknow, Madras, Hyderabad-Dn., Mysore, Patna, Nagpur, Travancore and Karachi.

The Journal of the Institution are published quarterly in March, June, September and December.

The Institution is represented on technical committees set up by the Government of India and State Governments and the governing bodies of several technical institutions. A set of rules has been framed and circulated amongst members for their guidance regard-

ing professional conduct. A bill for registration of engineers has been drafted by the Institution and submitted to the Government for consideration. With a view to stop the use of adulterated cement, a report was submitted to the Government of India, State Governments, etc. Shortly after the report of the Central Advisory Board of Education (commonly known as Sargent Report) the Institution submitted a printed detailed report in 34 pages to the Government of India for consideration as in certain vital matters it differed from the recommendations of the Sargent Report. At the instance of the Ministry of Industry and Supply, the Council of the Institution appointed a steel-saving committee to go into the question of steel-saving in India. The sub-committee has now submitted its report which will be forwarded to the Government of India after final approval by the Council.

The Institution of Engineers (India) acts as the Indian National Committee for the World Power Conference.

The Headquarters of the Institution are situated at 8, Gokhale Road, Calcutta.

### **INDIAN NATIONAL SOCIETY OF SOIL MECHANICS AND FOUNDATION ENGINEERING**

The Indian National Society of Soil Mechanics and Foundation Engineering was set up in 1948 with a view to encourage the study of the subject of Soil Mechanics and to devise ways and means to ensure the fullest use of this science in engineering projects. This society also provides liaison between its members in India and the International Society on Soil Mechanics and Foundation Engineering. The office of the National Society is for the present attached to that of the Central Board of Irrigation at Simla.

### **THE MYSORE ENGINEERS ASSOCIATION**

The Mysore Engineers Association was first established in the year 1863, and was attached to the Public Works Department of the Government of Mysore. The Departmental officers were enrolled as members with a view to enrich the general advancement of higher engineering, and to promote the acquisition of that branch of knowledge.

The functions of the Association are, (1) to establish contact with all individuals of the Department of Public Works, (2) to exchange information of technical knowledge, (3) to collect and supply information on irrigation projects of the State, hydro-electric and other allied subjects, and (4) to publish relevant literature.

Annual meetings are held every year wherein professional papers are read and discussed, and proceedings are published in the form of Bulletin.

The Association maintains a Library of technical books on engineering. The Association is in charge of an Honorary Secretary, and is working under the directions of a President.

In addition there are the Madras Engineers Associations and Uttar Pradesh Departmental Meetings (Irrigation), the functions of which are similar to the Mysore Engineers Association.

### **THE INDIAN INSTITUTE OF ARCHITECTS**

In 1917 some enthusiastic students, both past and present, of the Architectural Section of the Bombay School of Art, founded the Architectural Students' Association which afterwards became the Bombay Architectural Association in the middle of 1922. It was allied to the Royal Institute of British Architects, London, in 1925. Owing to its wider sphere of activities the above association was again named the Indian Institute of Architects in 1929.

Its main objects, amongst others, as stated in the Memorandum of Association are :

“To encourage the study of architecture ; to elevate the standard of architectural practice and by mutual support to promote the interests of Architects throughout India”.

The Institute brings out a quarterly publication, “The Journal of the Indian Institute of Architects” and at present it is in its sixteenth volume.

Another of the activities of the Institute, is the Sohrab F. Bharoocha Architectural Library founded to commemorate the memory of the late Mr. Sohrab F. Bharoocha, a past-President of the Institute in 1929. The Library contains many useful books on architecture.

Lectures and discussions on architecture and allied subjects are held under the auspices of the Institute from time to time. Under the auspices of the Institute the R.I.B.A. Examination Board in India conducts Final and Special Final Examinations in Architecture.

The affairs of the Institute are managed by a Council consisting of the President, Vice-President, two Honorary Secretaries, Honorary Treasurer and seven Ordinary Members. A number of Sub-Committees are formed to look into the various matters concerning the profession.

There are three kinds of membership *viz.*, Fellows, Associates and Subscribers.

### **THE FEDERATION OF ELECTRICITY UNDERTAKINGS OF INDIA**

Incorporated in February, 1943, the Federation of Electricity Undertakings of India is the organ of the Electric Supply Industry in India operated by private enterprise. The Federation has been established with a view to organise, maintain, promote, protect and assist the rights and interests of Licensees in India within the meaning of the Indian Electricity Act, 1910, and to facilitate the interchange of views between licensees with regard to matters of common

interest. Among its other important functions may be mentioned (1) to give the Government of India, State Governments, Municipalities and other Local Authorities, Associations and others facilities for conferring with and ascertaining the views of the Electric Supply Industry as regards matters directly or indirectly affecting the Industry, (2) to effect improvement in the administration and for the betterment of the Industry, and (3) to collect and circulate statistics and other information relating to the Electric Supply Industry.

Through the six State Electrical Associations, which constitute its membership, 180 Electric Supply undertakings are affiliated to the Federation.

The Federation issues monthly a Circular Letter for the benefit of its constituents (of which copies are sent to Government Departments and leading men associated with the Industry) keeping them in touch with developments affecting the Industry.

The Secretariat of the Federation is centred in Bombay (situated at Killick Building, Home Street, Bombay) and is in the charge of a Secretary.

### **THE BUILDERS' ASSOCIATION OF INDIA**

Established in the year 1941, the Builders' Association of India consists of leading building, constructional and engineering contractors working in India. The aims and objects for which the Association is established are (1) to encourage co-operation and friendly relations amongst builders in general and members of the Association in particular, (2) to watch, support, protect, extend and defend the rights of the Members, (3) to devise means and methods for promoting friendly relations with the suppliers of materials, (4) to try to settle by arbitration or otherwise disputes between members of the Association, and (5) generally to take into consideration all other questions as may be conducive to the attainment of the aims and objects of the Association.

Membership of the Association is open to persons, companies and firms connected with construction works of any kind including electric and sanitary works and with businesses or trades connected with the building trade. The entrance fee is Rs. 250 and the annual subscription Rs. 120 payable in advance.

The affairs of the Association are conducted by a Committee of seven called "MANAGING COMMITTEE" elected annually by the Members of the Association, consisting of President, Vice-President, Hon. Secretary, Hon. Treasurer and three members.

Meetings of the Managing Committee are held monthly and that of General Body every two months in Poona and Bombay alternatively, when subjects connected with construction trade and difficulties of members are discussed.

The Association has a Library on engineering, building construction and other allied subjects. The office of the Association is situated at United India Building, Sir Phirozshah Mehta Road, Fort, Bombay 1.

## **THE INDIAN ROADS AND TRANSPORT DEVELOPMENT ASSOCIATION LTD.**

The Association was formed in 1926 and registered in October 1927, having Council with headquarters in Bombay and Branches at Calcutta, Bombay, Madras, Nagpur, New Delhi and Gauhati (Assam), each with a Local Committee.

The annual subscriptions for membership of the Association are : Associate Members Rs. 5 ; Ordinary Members Rs. 10 ; Life Members Rs. 100 ; and Supporting Members Rs. 300.

The aims and objects of the Association are to promote the development of transport of any kind including Road, Motor and Air Transport throughout India by making representations to the Government of India, Governments of States, District Boards and other Public Bodies concerned, regarding the construction, improvement and maintenance of roads, bridges, aerodromes, etc., to make representations to all or any of the bodies regarding the adjustment of taxation, customs duties and excise affecting motor vehicles and other modes of transport and the employment of same in such a manner as to facilitate the development of transport throughout India ; to educate the public by means of propaganda and to create authoritative public opinion with regard to the needs of, and advantage to be derived from, improved road and air communications and the use of these forms of transport.

All persons, associations, firms or companies interested in Transport Development are eligible for election as members.

## **THE MECHANICAL ENGINEERS' ASSOCIATION (INDIA)**

Started in 1914 the Association has now grown full fledged with a membership of over 3,000 engineers, distributed in 20 Local Centres all over India and abroad. The objects of the Association are to promote the general advancement of engineering science (civil, mechanical, electrical etc.) and its application in India and to facilitate the exchange of views and ideas regarding allied subjects amongst members and persons attached to the association, and to maintain local centres in several important states and thus ensure each individual member being given equal opportunity to enjoy the rights and privileges of the Association in all engineering matters.

For the last 30 years the Association is publishing the monthly Journal "The Engineer".

Distinguished engineers of all India repute preside over its annual conferences held in different parts of India and award gold medals, cash prizes etc., for the best papers read at the Conference.

## **THE INSTITUTION OF SURVEYORS**

This Institution has been recently formed in India on the lines of the Royal Institution of Chartered Surveyors of United Kingdom. Its main functions are, (1) to promote the science and practice of

Land Surveying, Building and Quantity Surveying, Valuation of Estates, Mining and Agriculture Surveying, (2) to provide for the delivery of lectures and the holding of classes for the purpose of imparting education in the profession of surveyors, to test by examination or otherwise the competence of persons for the various branches of the profession, and to award certificates and distinctions, (3) to provide a channel for the expression of the collective opinion of surveyors on professional topics and to give Government Departments, the legislature and public bodies facilities for conferring with and ascertaining the views of surveyors, (4) to arrange and promote the adoption of legal and equitable forms of contracts and other documents used in the profession, to encourage and promote the settlement of disputes by arbitration, to act or nominate arbitrators, and to assist in the formation and functioning of Boards of Arbitrators, and (5) to publish relevant literature.

The first meeting of the Institution took place in May 1950 when the fore-most surveyors in the country met in Delhi. Almost the first task of the Institution is the drawing up of syllabus and courses of study for the various professional examinations which are to replace the examinations so far conducted by the Royal Institution of Chartered Surveyors, U.K.

## **ENGINEERING CONCERNS**

### **TATA HYDRO-ELECTRIC AGENCIES LIMITED**

The Tata Hydro-Electric System is operated as an integrated power system or "grid" serving an area in the State of Bombay of more than 1,000 square miles and an estimated population of five millions. It is the largest power system in India with an annual output equal to almost 30 per cent. of the total electricity production of India. The present generating capacity of the three hydro-electric stations is 247,000 kilowatts and the rated capacity of the interconnected steam-electric station of the Railways is 40,000 kilowatts. The System operates a total of 800 circuit miles of high voltage electric lines including 500 miles of transmission lines of 100,000 volt capacity. Electric Service is rendered to the textile mills and other important industries of Bombay, to the Railways for electric traction, to local authorities and in bulk for retail distribution to the electrical undertakings supplying Bombay City and Suburban Districts, Poona and several other localities in the area.

### **THE SOUTH MADRAS ELECTRIC SUPPLY CORPORATION LIMITED.**

This Corporation is one of the biggest electricity distributing undertakings in the country operating in three of the most populous districts in the Madras State extending over an area of 12,000 square miles. The total investment represented by the undertaking is nearly Rs. 1½ crores. The Corporation has a most creditable record in the matter of taking electricity into the rural parts and have

actively co-operated with the Government of Madras in the supply of electricity for agricultural purposes in the districts of Tanjore, Tiruchirapalli and Ramnad and also for starting and running small cottage industries. In spite of the power shortage experienced in South India during the year on account of the failure of the rains, the company's activities were kept up with the usual efficiency. The total units of power sold during the year 1949-50 amounted to about 5,00,000 units.

### **CALCUTTA ELECTRIC SUPPLY CORPORATION LTD.**

The Indian Electric Co. was formed in 1896 to take over the Calcutta Electric Lighting Licence. The name of this Co. was changed to that of the Calcutta Electric Supply Corporation in 1897 under which name it has operated since then. The Co. at present possesses the largest steam power station in India with a total installed capacity of 294,750 kW. The power system comprises three steam power stations viz., Cossipore, Southern and Mulajore. These stations supply power in the Calcutta industrial and residential area.

### **DELHI CENTRAL ELECTRIC POWER AUTHORITY**

The Delhi Central Electric Power Authority is an semi-autonomous Corporation formed by the Government of India for supply of electricity in Delhi. The Authority generates electricity and sells it in bulk to its customers on its actual cost basis. The present installed generating capacity at the central steam power station with two other diesel engines connected with the system is 37,536 kW. A new diesel engine of 5,000 kW. capacity is under construction.

In addition there are several other industrial concerns manufacturers of engineering materials and goods such as cement, steel, paints, chemicals.

### **EDUCATIONAL INSTITUTIONS**

Almost every State in India has one or more engineering institutions to cater for the needs of the administration and profession in the State. In addition to Government institutions some private engineering institutions have also sprung up. Some of these institutions provide facilities mainly for post-graduate and research work in addition to any other facilities that may be available. These include college of Technology, Banaras Hindu University; Butler Technological Institute, Kanpur; Indian Institute of Science, Bangalore; Jeypore Vikram Deo College of Science and Technology, University of Andhra, Waltair, University College of Science and Technology, Departments of Applied Physics and Applied Chemistry, Calcutta University, Calcutta and Luxminarayan Institute of Technology, Nagpur University, Nagpur.

The second category of Institutions offer primarily degree or equivalent courses. These include College of Engineering and Technology, Aligarh Muslim University, Aligarh; Delhi Polytechnic, Delhi;

Engineering College, Banaras Hindu University, Banaras; Punjab Engineering College, Roorkee; University of Roorkee; Alagappa Chettiar College of Technology, University of Madras, Saidapet, Guindy, Madras; Arthur Hope College of Technology, Coimbatore, Madras; College of Engineering, Guindy, Madras; College of Engineering, University of Travancore, Trivandrum, Travancore State; College of Engineering (Vizag.), Coconada, Madras; College of Engineering, Bangalore, Mysore; Department of Engineering and Technology, Annamalai University, Annamalaiagar, Madras; Engineering College, Anantpur, Madras; Osmania Engineering College, P.O. Lallaguda, Hyderabad (Deccan); Sri Krishnarajendra Silver Jubilee Technological Institute, Bangalore, Mysore; Bengal Engineering College, P.O. Botanic Garden, Howrah, West Bengal; Bihar College of Engineering, Patna, Bihar; College of Engineering and Technology, Jadavpur, Calcutta; Indian School of Mines, Dhanbad, Bihar; Victoria Jubilee Technical Institute, Matunga, Bombay.

The third category of institutions offer primarily diploma of equivalent courses. These include Government Central Textile Institute, Kanpur; Government Central Weaving Institute, Banaras; Government Technical Institute, Gorakhpur; Government Technical Institute, Jhansi; Government Technical Institute, Lucknow; Government Metal Works Institute, Ambala City; Technical College, Dayalbagh, Agra; Civil Engineering School, La Touche Road, Lucknow; Government School of Technology, Pophams Broadway, Madras; Government Textile Institute, Washermanpet, Madras; Institute of Textile Technology, University of Travancore, Trivandrum; Institute of Leather Technology, Washermanpet, Madras; Osmania Technical College, Hyderabad (Deccan); Sri Jayachamarajendra Occupational Institute, Bangalore, Mysore; A. G. Polytechnic, Vuyyur, Madras; Andhra Polytechnic, Coconada, Madras; Central Polytechnic, Madras; Dravida Polytechnic, Madura, Madras; Kerala Polytechnic, Calicut, Madras; Karnataka Polytechnic, Magalore, Madras; Bengal Textile Institute, Serampore, Hoogly, West Bengal; Bengal Silk Technological Institute, Berhampore, West Bengal; Calcutta Technical School, Sir Surendranath Banerjee Road, Calcutta; Calcutta Engineering College, 13, Jamir Lane, Ballygunge, Calcutta; Kanchrapara Technical School, Kanchrapara, West Bengal; Orissa School of Engineering, Cuttack, Orissa; Kalabhavan Technical Institute, Baroda; Government Engineering School, Sadar Bazar, Nagpur; Government Tanning Institute, Bandra, Bombay-20; Government Leather Working Institute, Bandra, Bombay-20; Sir Cusrow Wadia Institute of Electrical Technology, 19, Bund Garden Road, Poona, Bombay.

The Institutions in the fourth category provide certificate or equivalent courses. These include Rampur Government Polytechnic, Rampur; Technical College, Jodhpur, Rajputana; Engineering College, Civil Lines, Ludhiana, Punjab; Government School of Industry, Satara City, Bombay; O'Brien Technical Institute, Sholapur, Bombay; Morvi Technical Institute, Morvi, Kathiawar; F. S. Parekh Technical Institute, Chowaypura, Ahmedabad; R. C. Technical Institute, Railwaypura, Ahmedabad; School of Industry, Ratnagiri, Bombay.



Detailed description of each of the above Engineering and technological institutions is not possible in this leaflet but those interested can have it from the institutions concerned. A brief description is furnished here of the Indian Institute of Science, Bangalore, and the University of Roorkee and School of Military Engineering, Kirkee.

### **INDIAN INSTITUTE OF SCIENCE (BANGALORE)**

This Research Institute started functioning in 1911 through private enterprise of Messrs. Sir Dorabji Tata and Sir Tatanji Tata. The laboratories of the Institute provide facilities for post-graduate work in physics, Cosmic Ray Research, General Chemistry, Organic Chemistry, Bio-Chemistry, Electrical Technology and Aeronautical Engineering. The Institute also maintains a library of scientific books and journals. The scientific work of the Institute is published in the Quarterly Journal of the Institute. A Power engineering Section has recently been sanctioned and is being organised.

### **UNIVERSITY OF ROORKEE**

Inaugurated by the Hon'ble Prime Minister Pandit Jawaharlal Nehru in November 1949, the University of Roorkee has been based upon the Century old Thomason College of Engineering. The University, which is completely residential has been sponsored by the Government of Uttar Pradesh and its charter gives it an engineering bias, but it is intended to develop it into the fields of technology and applied sciences. It is situated in a campus of some 400 acres of pleasant rural surroundings in the small town of Roorkee near the famous Ganga Canal during the construction of which it was first established as a College of Engineering. There is a long tradition of training in Civil Engineering of a high standard and many famous engineers are numbered amongst its alumni.

### **SCHOOL OF MILITARY ENGINEERING**

The School of Military Engineering was founded in 1943 in the grounds of the Thomason College, now the Roorkee University. During and immediately after the war it was occupied in training all ranks of the engineering and Military Engineer Service in their duties. During the winter of 1947-48 the School moved to its present location on the outskirts of Kirkee (Poona) where new accommodation is in process of construction. The School's main function is to train young officers of the Corps of Engineers in basic engineering.

A course of some two and a half years equivalent to an Engineering degree course is run. Somewhat similar courses are at present provided for officers of the Electrical and Mechanical Engineers and the Corps of Signals. For this purpose the School is fully equipped with workshops and laboratories.

In addition, a Field Engineering Wing trains all ranks of the Corps of Engineers in purely military engineering technique. Instructors, technicians and craftsmen are trained in the workshops and survey school.

A number of courses are also run for gazetted officers and subordinates of the Military Engineer Services.

The School maintains a central library for reference by officers of the Corps of Engineers.

### ALLIED ORGANISATIONS

Detailed information about the functions and activities of allied departments will be found in a leaflet entitled 'Scientific Organisations and Societies in India' issued by the Council of Scientific and Industrial Research. Below are given a very brief note for each of them so as to make this leaflet self-contained—

**The Survey of India.**—The Survey of India was founded as early as 1767. The original maps related to military reconnaissance but during the course of years this Department has now become primarily responsible for all topographical surveys, explorations and the maintenance of geographical maps of the greater part of Southern Asia, and also for geodetic work and aerial surveys. The map publication offices are located at Calcutta and Dehra Dun.

**Geological Survey of India.**—The Geological Survey of India in its present form was founded in 1851. Its primary functions is the preparation of a general geological map of India, the basis on which all geological work, including an appraisal of the mineral deposits of the country must rest. The advice of the Geological Survey of India is taken by the Central Government and others on all questions of mineral policy. This Department issues Annual and Quinquennial Review of Mineral Production of India, bulletins giving a brief summary of knowledge on a particular mineral and also a quarterly journal 'Indian Minerals'.

**India Meteorological Department.**—The India Meteorological Department was established in 1875. Its main functions include (1) The issue of warning to ships, ports and coastal districts of the approach of cyclonic storms, (2) the maintenance of systematic records of meteorological data and the publication of climatological statistics, (3) The issue of up-to-date weather reports and forecasts, (4) Meteorological researches of a general character and (5) the study of agricultural meteorology.

**The Bureau of Mines.**—The Government of India have recently set up a Bureau of Mines with the object of assisting the mineral industry in the country by disseminating the available information on Indian minerals and advising the public on the development and utilisation of mineral resources. The Bureau publishes a quarterly Journal 'Indian Miners' in which information is couched in a simple form readable by the general public.

**The Forest Research Institute.**—Opened first in 1914, the Forest Research Institute was considerably expanded in 1929 and located at the Kulagarh Estate, a few miles from Dehra Dun. There are five main branches of forest research, namely Silviculture, Forest Botany, Utilisation, Entomology and Chemistry and Minor Forest Products. The Institute is a centre of forest research work and is a co-ordinating body for the forest research work carried out in India. It also acts as an information bureau on silviculture. The Institute issues a large number of bulletins and other publications on forest research.

**Indian Science Congress Association.**—The Indian Science Congress Association was founded in 1914 with its main objective as the advancement of science in India. The annual session of the Congress is organised for the purpose of encouraging research and making the results generally known and promoting public interest in science. Membership of the Association is open to all interested in the activities of the Congress and its work is divided into various sections.

**Agricultural Research.**—For Agricultural Research there are two important Institutes in India viz., Indian Council of Agricultural Research and Indian Institute of Sugar Technology Kanpur.

**Indian Council of Agricultural Research.**—Set up in 1929 at the recommendation of the Royal Commission on Agriculture, the Indian Council of Agricultural Research consists of a Governing Body and an Advisory Board. The functions of the Council are to undertake, aid, promote and co-ordinate agricultural and animal husbandry education, research and its application in practice, development and marketing in India by all means calculated to increase scientific knowledge of the subjects and to secure its adoption in every day practice. The Council finances a number of agricultural research units in various States.

**Council of Scientific and Industrial Research.**—The Council of Scientific and Industrial Research, in its present form was set up in 1941 by the Government of India as an autonomous body. Its functions include (a) the promotion, guidance and co-ordination of Scientific and Industrial Research in India, (b) the establishment and award of research studentships and fellowships, (c) the utilisation of the results of research and (d) the establishment, maintenance and management of laboratories, workshops, institutes and organisations to further scientific and industrial research and to utilise and exploit for purposes of experiment any discovery or invention likely to be of use to Indian industries.

**National Laboratories.**—The Government of India, during the last four or five years, have laid the foundation of a number of National Laboratories in the country to undertake research on different subjects. These include the National Fuel Research Institute, the National Metallurgical Laboratory, the National Physical Laboratory, the National Chemical Laboratory and the Central Glass and Ceramic Research Institute.

**Indian Standards Institution.**—The Indian Standards Institute was set up by the Government of India in 1946 for the preparation of standards to suit Indian conditions. The affairs of the Institution are managed by the General Council representing different Industries and Government departments and other Allied Institutions. The work of the Institution is divided into five sections, engineering, buildings, chemicals, textiles and food and agricultural products, each controlled by a Division Council. The actual preparation of standards is done by small committees of experts representing various interests such as producers, consumers and technical experts.

**Central Board of Geophysics.**—The Government of India have recently set up the Central Board of Geophysics, consisting of representatives of the interested Government Departments and other institutions in India. Its main functions are, (a) to co-ordinate the existing resources of the scientific departments and universities in Geophysics for research, field work and training of personnel, (b) to develop the resources and (c) to implement the recommendations of the Planning Committee for Geophysics for setting up a Central Geophysical Institute.