

GROWTH OF SCIENTIFIC PERIODICALS IN INDIA
(1901-1947)

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1. INTRODUCTION

This is a continuation of the work *Growth of Scientific Periodicals in India* (1788-1900) published first in *Indian Journal of History of Science* during 2002 and subsequently as a book by Indian National Science Academy also in 2002 [Sen]. Hence, the objective of the study remains the same as the earlier work to portray the scenario of scientific periodicals that emerged and flourished in India during 1901-1947 along with educational and other related developments that helped the growth and sustenance of the periodicals.

An attempt has been made in this study to enlist all scientific periodicals including annual and other periodic reports of S&T departments of central and state governments, scientific organizations and institutions, etc published in English, Bengali, Portuguese and other Indian languages.

The geographic limit of the study remains confined to British India that now forms India, Pakistan and Bangladesh.

The period covered is 1901 to 1947. The earlier study and this one taken together provide a comprehensive scenario of scientific periodicals that emerged and flourished in British India. The total number of periodicals that emerged during British rule from India goes well-nigh 2500. They have appeared in all forms comprising research periodicals, technical periodicals, popular periodicals, annual and other periodic reports, newsletters, and so on. In terms of quality they varied from high grade research periodicals to layman's popular periodicals. These periodicals covered all fields of science and technology known during the period. The scientific and technological (S & T) contribution from India reflected in the periodicals was substantial.

The time span of 1901-1947 is important both from the point of view of Indian as well as world history. On the one hand, the period saw

intense political movement to free India from British rule and the world on the other hand saw two world wars of unimaginable dimension. These political movements and upheavals all over the world impacted greatly global periodical scenario. In many cases, they were responsible for the cessation of some periodicals, temporary discontinuance of many, as well as retardation in the overall growth of periodicals. It is also true that some political developments like *swadeshi* movement in India, partition of Bengal, creation of Bihar and Orissa state, etc gave rise to a number of periodicals.

In the pages that follow, the scenario will be described in three parts. The first part will cover the years from 1901 to 1913. The period that helped the growth of the periodicals without any impediment. The second part starts with the year 1914 when the World War I started and ends with the year 1938, just before the onset of World War II. The third part starts with 1939 and ends with 1947 that witnessed the end of British rule in India.

2. SCENARIO 1901 - 1913

The first learned periodical from India called *Asiatick Researches* was stated in the year 1788. The periodical devoted to orientology was heavily biased towards science. For more than three decades *Asiatick Researches* acted as the only vehicle for scientific communication from India. As the years went by, more and more periodicals started emerging on different subjects with variegated contents and quality. Periodicals on regional languages also started appearing.

The factors that helped in the growth of the periodicals during 19th century are the establishment of societies and institutes, numerous government departments at the centre and the states; universities; agricultural, medical, engineering and veterinary colleges; agricultural experiment stations; hospitals, asylums and sanitariums, research laboratories; observatories; botanical gardens, zoological gardens and parks; various surveys (archaeological, botanical, geological, trigonometrical), institutes and individual efforts.

During the same period, Calcutta, Bombay, Madras and many other cities became the centres of periodical publication.

Another important point to be noted here is that from the later part of the 19th century Indians also joined the British in conducting research and bringing out periodicals. With this background, when we enter the 20th century we find that everything that needed for the birth of periodicals are available not only in big cities but also in smaller cities in India. Hence, the growth of periodicals could only have been smooth. It is also to be remembered that scientific institutions and organizations, central and provincial government departments, societies, and other bodies that were publishing periodicals in the 19th century, many of them continued their periodical publications in the 20th century as well. Some of them started new titles also.

POLITICAL DEVELOPMENT

Here, only those facets of political development are being highlighted that had direct impact on the birth, cessation, and decline of the periodicals. The following political developments of the period affected the periodical scenario of the country.

The north-western areas of India which had been under the control of Sikhs for a long time were annexed by the British after the second Sikh War of 1849. The areas formed part of the erstwhile Punjab till 1901 when North-West Frontier Province was created with the areas [EB 13, 255]. With the formation of the Province, the following S&T departments were also created - Department of Agriculture, Chemical Examiner, Forest Department, Medical Department, Public Works Department and its Irrigation Branch, Revenue Department, Vaccination Department and Civil Veterinary Department. All these departments started bringing out periodicals from 1901 itself.

Berar which was having its independent existence till 1903 was merged with Central Provinces in the same year and the new province was named as Central Provinces and Berar [EB 11 : 279c]. Both the provinces had quite a few S&T departments earlier. The new province had Public Works Department, and its Irrigation Branch. Both started publishing periodicals after their establishment.

The most important political event of the period is the division of Bengal to form a new province called Eastern Bengal and Assam on 16 October 1905 [SBI 2:358]. This decision of the British created great political outburst in Bengal and at the same time helped in giving birth to a number of new periodicals.

The state of Baroda made great progress during the rule of Sayajirao III (1875-1939). He appointed the Sanitary Commissioner in 1906, established the Department of Commerce and Industry in 1907 and Department of Agriculture in 1910. According to this study, Baroda was the first state in British India to start a department of industry. All started bringing out periodicals from the respective years.

On 1st April 1912, yielding to the unflinching demand of Bengalees, Eastern Bengal was merged back to Bengal, Assam regained its original position, and the western part of Bengal was sliced out to form a new province, called Bihar and Orissa. The formation of Bihar and Orissa gave rise to a number of departments in the new province such as Civil Medical Department, Civil Veterinary Department, Department of Agriculture, Department of Land Records and Surveys, Forest Department, Public Health Department and Vaccine Department. All these started publishing annual reports, data periodicals and so on soon after their establishment.

DEVELOPMENTS IN GOVERNMENT SECTOR

The formation of states like North-West Frontier Province, Central Provinces and Berar, Eastern Bengal and Assam, Baroda, and Bihar and Orissa paved the way for the starting of a number of S&T departments, offices etc in these states. The states that were formed in the 19th century as well as the Centre also started some new departments. All these departments, offices, etc brought out periodicals. These departments are being highlighted in brief.

Department of Land Records and Surveys

The new state of Bihar and Orissa formed in 1912, created the Department in the same year that started bringing out *Annual Report of the Survey and Settlement under the Control of the Director of the Department of Land Records and Surveys, Bihar and Orissa* from 1912.

Revenue Department

North-West Frontier Province created the Department in 1901 and it brought out the periodical *Forecast of the Wheat Crop*. Mysore established the department as General and Revenue Departments in 1908 and brought out the *Report on the Government Stud Form...at Kunigal*.

Department of Industry

The state of Baroda established the Department of Commerce and Industry in 1907, and Madras the Department of Industries in 1909.

Board of Scientific Advice for India

Starting from the beginning of the British empire no department on science in general was established in India till 1947. However, Board of Scientific Advice for India was established in 1902 that functioned for about twenty years.

Chemical Examiner

In the 19th century, provinces like Bengal, Bombay and Madras appointed chemical examiners or established chemical examiners' departments. The trend continued in the 20th century as well. The new state of North-West Frontier Province appointed the Chemical Examiner in 1901 itself just after its formation. The Chemical Examiner was appointed at Defence Headquarters at Nainital in 1908. Gradually the office gained strength and finally became Explosives Research and Development Laboratory after 1947.

Indian River Commission

The Public Works Department of Sind published *Indian River Commission Records* during 1907 to 1925. From this, it appears that the Commission was established in 1907 or before.

Archaeological Commission

The Government of Portuguese India set up the Archaeological Commission in or before 1904. The Commission was called *Commissao Archeologica de India Portugueza*.

Economic Botanist

The Government of Bombay appointed the Economic Botanist in 1913 or before. The Report of the Economic Botanist was published for a few years.

Patent Office

The Patent Act of India was passed in 1856 [Ray]. However, we find the mention of Patent Office from around 1910. Possibly its permanent office was established in Calcutta around that time.

Medical Departments, Boards, etc.

The trend of setting up medical departments that started in the 19th century continued in the 20th century as well. North-West Frontier Province established Medical Department soon after its establishment in 1901. Bihar and Orissa also followed suit and established the Department in 1912 as Civil Medical Department. There is evidence that Royal Medical Board was established during this period and was responsible for the journal *Bhisakacârya* (1903).

Sanitary Commission

Following the trend of the 19th century, the newly formed states of Baroda, and Bihar and Orissa also appointed sanitary commissions during the period.

Smoke Nuisance Commission

In the 19th century, smoke did not become a nuisance possibly because of the less number of industries existed at that time. In the 20th century, it did become a nuisance, and commissions were set up first in Bengal in 1906 and next in Bombay in 1913.

Malaria Bureau

The scourge of malaria was haunting India for centuries taking millions of lives. Through the research of Sir Ronald Ross, mosquito was established as the cause of the same. To combat the dreaded disease, the Government of India constituted the Imperial Malaria Committee in 1910, and Punjab established Malaria Bureau in 1919.

Vaccination Department

To control small pox, vaccination departments started coming up in India since 1850 [Sen]. Bombay was the first to have this Department followed by other provinces like Bengal and Madras. The trend continued in the 20th century as well. Bihar and Orissa has this department in 1911 and Mysore around the same time. The Imperial Serologist Department was established in 1912.

Public Works Department

This Department was of special significance to the British as they were to build roads, railways, buildings and so on. Way back in 1850, Madras had this Department. Gradually, the Department came up in other provinces as well. The trend continued in the 20th century also. North-West Province had this Department as well as its Irrigation Branch in 1901. Punjab had the Buildings and Road Branch of the Department in 1903. Bihar and Orissa went for the Engineering Branch of this Department soon after its formation in 1911.

Railway Board

Railway Board was constituted in 1904 and its Coal Department was set up in 1912 or before.

Department of Agriculture

The repeated incidence of famine resulting in the loss of million of lives in India forced the British to look deeply into agricultural production. This led to the establishment of the Department of Agriculture or the like in the 19th century in almost every province ruled by the British. The trend continued in the 20th century also. The provinces like North-West Frontier Province, Central Provinces and Berar, Eastern Bengal and Assam, Travancore, Baroda, Bihar and Orissa – all had the Department of Agriculture. The Board of Agriculture in India was also established in 1905.

Forest Department

The provinces that had substantial area of forest went for the forest departments in the 19th century. The provinces like North-West Frontier Province, and Bihar and Orissa that formed newly in the 20th century also established their own Forest Departments because of the forest resources they had. Like the Board of Agriculture in India, the Board of Forestry for India was also established in 1910.

Civil Veterinary Department

Civil Veterinary Departments started emerging from 1880s in various provinces of the country. The trend continued in the 20th century also. During 1901-1913, North-West Frontier Province, Central Provinces and Berar, Ajmer-Merwara, Eastern Bengal and Assam, Mysore, Madras, Punjab, Bihar and Orissa

had this Department. The Government of Punjab appointed a veterinary officer for investigating camel diseases in India.

Fisheries Department

Fisheries did not receive much attention in the 19th century, possibly because fish was available in plenty in seas, rivers, lakes, ponds, etc. Hence no province started this department. The situation changed in the 20th century, and Madras, Punjab, Bengal started Fisheries Department or the like during the period.

Explosives Department

The Government of India appointed Chief Inspector of Explosives in 1900 or before (Sen: S.98). No other state went for the Department, except Mysore which also appointed Chief Inspector of Explosives in or before 1901.

Architectural Department

In the 19th century, the Architectural Officer/Department was practically non-existent at the centre or the states. Only North-Western Provinces and Oudh had Architectural Branches of the Archaeological Survey. Evidences suggest that Office of Architect of the Government of India was started in or before 1907.

EDUCATIONAL DEVELOPMENT

The spread of English education that started in the 19th century with the establishment of five universities in Calcutta (1857), Bombay (1857), Madras (1857), Punjab (1882) and Allahabad (1887) and a number of general, medical and engineering schools and colleges, continued in the 20th century as well. Most of the educational institutions established in the 19th century continued to function with extended scope in the 20th century. Some of them were upgraded as well. In addition to these institutions, new institutions also came up. Some of the institutions that emerged during 1901-1913 are being briefly described here.

UNIVERSITIES

No new university started during the period. However, University of the Punjab added the Department of Zoology in 1902; University of Madras started the Department of Chemistry in 1908 at the Central College.

COLLEGES

Medicine

Medical education in India which made a modest beginning in 1830s continued to grow with the passage of time, and by the end of the 19th century, there were more than a dozen medical schools and colleges functioning in various parts of the country. The trend continued in the 20th century as well and in 1905 Venkataramana Ayurved College was established in Madras. Possibly this was the first Ayurved college established in the 20th century.

Engineering

The trend of engineering education initiated in the 19th century continued unabated in the 20th century. Bengal Engineering College was set up at Sabour in 1911. The name of the College was changed to Bihar Engineering College as Sabour came under the jurisdiction of Bihar and Orissa following the creation of the state in 1912. Another engineering college was set up at Lahore in 1913 called Punjab Engineering College.

Agriculture

The agricultural education which had a very modest beginning in the later 19th century, started gathering momentum from the beginning of the 20th century. The Engineering College at Poona added an agricultural wing in 1879. Probably that wing turned into the Poona (District) Agricultural College in 1906 [WoL]. Similarly, the Agricultural School that started at Nagpur in 1888 turned into the Agricultural College, Nagpur in 1902 or before. Punjab Agricultural College and Research Institute, Lyallpur was started in 1909 and went under the jurisdiction of Pakistan after independence.

Forestry

Forestry education had its beginning in India in 1878 with the foundation of Forest School at Dehra Dun. The educational facility for the subject was provided in South India with the establishment of Madras Forest College in 1912.

Veterinary College

The Government of Madras established Madras Veterinary College in 1903 to impart training and conduct research. It is bringing out *Madras Veterinary College Annual* since 1942.

SCIENTIFIC ORGANIZATIONS

The scientific organizations that emerged during the period comprised museums, institutions, surveys, observatories, botanical gardens, agricultural experiment stations, demonstration farms, fruit gardens, and dairies. About eighty organizations have been recorded here. The names of the organizations, in a few cases with brief description is being given below in classified order. Most of the organizations brought out periodicals.

Museums

Prince of Wales Museum of Western India (1905), Rajputana Museum (1908), and Dacca Museum (1913) were established during the period. All these museums had archaeological collection, natural history collection, etc. apart from other collections.

Ethnography

Ethnographic Survey of Mysore was established in or before 1906. It also brought out periodic publications.

Science

The establishment of Indian Institute of Science at Bangalore in 1909 with the financial support of Jamshetjee Nusserwanji Tata [Rajagopalan et al: 510] was a great event in the history of science in India. The Institute has been making rich contributions in many branches of science since its inception. The research papers produced by the Institute have been published in important national and international journals. It started publishing *Annual Report* and *Journal of the Indian Institute of Science* in this period.

Natural History

Indian Museum had its nucleus in 1814. The Indian Museum Act (Act No. XVII of 1866) was passed in 1866 and the Museum was thrown open to public on 1st April 1878. The Natural History Section of the Museum started in or before 1907.

Observatories

Three observatories, i.e. Maharaja Takhtasingi Observatory (c1902), Kolar Gold Field Observatory (c1909) and Nizamiah Observatory (c1908) came into existence during the period. All the three observatories brought out periodic publications.

Archaeology

Archaeological Survey of India that started in 1861 [Sen: S51/52] gradually covered entire India with the establishment of various circles. Some archaeological departments and surveys also started in the 20th century. During 1901-13, Mysore Department of Archeological Survey of India (c1901), and Archaeological Survey of Mayurbhanj (c1912) were established. Both brought out periodic publications.

Microbiology

No independent microbiological institution was established during the period. However, the Bacteriological Section of the King Institute of Preventive Medicine was opened on 8th May 1902, and the Serum Section on 21st December 1903 [Rajagopalan et al: 468]. The Bacteriological Section published its *Annual Report*.

Botany

As in the 19th century, the establishment of botanical gardens and parks continued in the 20th century as well. During the period under study, several gardens came into existence such as : Government Gardens and Parks, Mysore (c1904), Ganeskhind Botanical Garden, Kirkee (c1906); Empress and Bund Gardens, Poona (c 1907); and Bryant Park, Kodaikanal (1908).

Entomology

The first Report of the Entomological Survey of Mysore is dated 1906. From this it is presumed that the Survey was established in 1906. Neither the Government of India nor the governments of any other presidency, province or state seems to have started the Survey till 1947. This seems to be the unique achievement of the Government of the Mysore State.

Technology

Victoria Technical Institute established at Madras in this period seems to be the only institute on the subject that appeared during the period.

Pharmacology

Central Research Institute was established in 1905 at Kasauli to manufacture various vaccines, serums, antigens etc; to act as government of India's Central

Drug Laboratory; to carry out research of medical and public health importance; etc [Rajagopalan et al: 268]

Malaria

Central Malaria Bureau was established in India in 1909. Later on the name of the Bureau was changed to Malaria Institute of India. In 1963, the name of the Institute was again changed to National Institute of Communicable Diseases [Rajagopalan: 271].

Virology

Pasteur Institute of India was established at Kasauli in 1900 or before to manufacture vaccines to combat rabies. Next came up Pasteur Institute of Southern India in Madras in 1906 to cater to the needs of the southern India. Vaccination Institute at Bangalore was established in or before 1912.

Materials Testing

The Government Test House was established in 1912 in Calcutta under the auspices of the Railway Board for proper evaluation of materials of indigenous origin used by the railways of the country. Later on the name of the Test House was changed to National Test House.[Rajagopalan:291]

Roadways

For the construction of roads, railways, etc East India Company established Public Works Department at Madras Presidency around 1850. However, it appears from the study that no institution exclusively devoted to road construction was established till around 1907 when Permanent Way Institution came up.

Agriculture

The most important agricultural institution established during the period is the Agricultural Research Institute at Pusa in North Bihar in 1905. It was later named as Imperial Agricultural Research Institute. Following the devastating earthquake of 1934 it was shifted to its present location in Delhi in 1936. The name of the Institute was changed to Indian Agricultural Research Institute after independence in 1947 [Rajagopalan et al: 99]. The Institute has been responsible for starting a number of important journals in agriculture and related fields.

Agricultural Stations

The recurrence of deadly famines of unimaginable dimensions at frequent intervals in India in the 19th century forced the British government to devote greater attention towards agricultural development. In the last phase of the 19th century about half a dozen agricultural farms were established to conduct experiments on various aspects of agriculture. The trend continued and during 1901–13 about fifty experiment stations and demonstration farms were established. The stations/farms established in chronological order were: Kovilpatti Research Station (1901); Lyallpur Agricultural Station (c1901); Seed Multiplication and Adoptive Research Farm (1902); Agricultural Farm, Powerkheda (1903); Sripur Agricultural Station (c1904); Rajshahi Agricultural Station (c1904); Rangpur Station (c1904); Upper Shillong Agricultural Station (c1905); Attur Agricultural Station (c1905); Bellary Agricultural Station (c1904); Hagari Agricultural Station (c1905); Koilpatti Agricultural Station (c1905); Palur Agricultural Station (c1905); Samalkota Agricultural Station (c1905); Bassein Botanical and Agricultural Station (c1906); Dharwar Agricultural Station (c1906); Dhulia Agricultural Station (c1906); Manjari Agricultural Station (c1906); Nandyal Agricultural Station (c1907); Baramati Demonstration Form (c1906); Nadiad Agricultural Station (c1906); Surat Agricultural Station (c1906); Aligarh Agricultural Station (1906); Mirpurkhas Agricultural Station (c1906); Dacca Agricultural Station (c1907); Daulatpur Reclamation Station (c1907); Muvalia Agricultural Station (c1907); Agricultural College Station, Poona (c1907); Taliparanba Agricultural Station (c1907); Bankipur Agricultural Experiment Station (c1908); Dohad Agricultural Station (c1908); Loonavla Agricultural Station (c1908); Partabgarh Agricultural Station of the United Provinces of Agra Oudh (c1908); Gokak Canal Agricultural Station (c1909); Kalimpong Demonstration Form (c1909); Coimbatore Agricultural Station (c1909); Chinsurah Farm (c1909); Gurdaspur Agricultural Experiment Station (1910); Basirhat Agricultural Station (c1911); Gadag Agricultural Station (c1911); Sukkur Agricultural Station (c1911); Agricultural Station, Tarnab (c1911); Burirhat Agricultural Station (c1911) Attara Experiment Station (c1911); Alibag Agricultural Station (c1911); Anamalai Agricultural Station (c1912); Benares Agricultural Station of the United Provinces of Agra and Oudh (c1912); Manganallur Agricultural Station (c1912); Agricultural Station, Londhi

(c1913); Larkana Agricultural Station (c1912); Ratnagiri Experimental Station (c1913); Jalgaon Agricultural Station Seed Farm (c1913); Satara Station (c1913) and Sholapur Station (c1913). Many of the stations brought out periodic reports recording their activities.

Rice

The Rice Experiment Station, established at Karimganj in Assam in 1913 is the oldest rice experiment station in Assam, and possibly in India. Like many other stations it also brought out its *Annual Report*.

Sugarcane

The Sugarcane Breeding Station was established at Coimbatore in 1912 to breed improved sugarcane varieties for all the cane tracts of British India and to conduct fundamental research on various aspects of sugarcane. In 1950 the name of the Station was changed to Sugarcane Breeding Institute [Rajagopalan: 132].

Tea

Tea became an important drink in British India as well as a commodity of national and international importance. For the improvement of tea cultivation, a research station was but a necessity in India. Hence, came up the Tocklai Experiment Station in Assam in 1911.

Horticulture

Fruit growing also started getting attention in India from the early 20th century. Fruit stations, orchards, etc started coming up gradually. In this study, two such institutes have been encountered which were established during the period. They are: Shillong Fruit Garden (c1904) and Fruit Experiment Station, Quetta (c 1913).

Animal Husbandry

This subject also received little attention in India in the 19th century. However, from early 20th century attention was paid towards this direction also and the Government Cattle Farm was established at Hissar by the government of Punjab around 1912. The Indian Poultry Club also came up in or before 1910.

Dairies

The establishment of institutions exclusively devoted to dairying in India seems to be the phenomenon of the 20th century. During 1901-1913 several such institutions were started as Kirkee Civil Dairy (c1907), Agricultural College Dairy (c1907) and Military Dairy Farms around 1910.

Sericulture

An institution exclusively devoted to sericulture was not encountered in the 19th century. This field also attracted the attention of the British in the 20th century. As a result Tasar Silk Rearing Station came up at Chaibasa in Bengal in or before 1907.

Textiles

Only one institute, i.e. Government Central Weaving Institute has been recorded. It was founded in 1910. [Elhence et al:]

SOCIETIES, ASSOCIATIONS, ETC.

Industry

Only one industrial society, i.e. Indian Industrial Conference (1905) appeared during the period. The 1st *Report* of the Conference appeared in 1905 and the last, i.e. 14th in 1919.

Science

The trend of establishing scientific societies for the promotion of science continued in the 20th century as well. The aim of many of the societies was to promote the study of science in regional languages. A few of such societies were: Bangiya Vijnan Sabha (c1909), Society for the Promotion of Scientific Knowledge (c1912) and Vijnan Parishad (c1913). They were established to promote science respectively in Bengali, Urdu and Hindi. Indian Research Society was also formed around 1908 at Calcutta.

Natural History

Several societies on the subject appeared in the 19th Century. One more, i.e. Baluchistan Natural History Society (c1907) was established during the period. The Society brought out its *Proceedings* during 1907 to 1924.

Mathematics

Indian Mathematical Club established around 1901 seems to be the first mathematical society of India. From 1907 onwards, the name of the Club was changed to Indian Mathematical Society. Calcutta Mathematical Society came up next in 1908 (WoL2002: 729). Indian Mathematical Society started its *Journal* in 1909 and Calcutta Mathematical Society its *Bulletin* in the same year.

Astronomy

Though a number of astronomical periodicals appeared from India in the 19th century, no astronomical society could be traced. Hence, Astronomical Society of India established in or before 1909 seems to be the first society on the subject. The Society started its *Journal* in 1909 which continued till 1920.

Chemistry

The Chemical Society established at the Presidency College, Calcutta, around 1908 seems to be the first chemical society of India. Possibly, the Society was short-lived. However, it brought out its *Proceedings* during 1909 – 1910.

Archaeology

Tamilian Archaeological Society (1907) seems to be the first archaeological society to be established in India in the 20th century. The Society started publishing *Tamilian Antiquary* from 1907.

Medicine

The number of societies established in the field of medicine was quite impressive i.e. 10. In chronological order, they were as follows: Agra Medical Club (c1903), Calcutta Medical Club (c1906), Hospital Assistants Association (c1907), Ayurved Vijnan Samiti (c1908), Association of Medical Women in India (c1909), Bombay Medical Congress (c1909), Pasteur Institute Association (1909), Trained Nurses Association of India (c1910), Medical Section, Asiatic Society of Bengal (c1910), Associacao Medico-Pharmaceutice de India (c1912), All India Ayurvedic Congress (c1913), Indian Research Fund Association (1913), and Madras Medical Association (1913). Of the associations established, Indian Research Fund Association was the most important. With the passage of time the Association grew in strength and importance and finally became the noted Indian Council of Medical Research. The periodicals brought out by the Societies include among others: *Agra Medical Club Journal* (1903); *Calcutta Medical Journal* (1906); *All India Hospital Assistants' Journal* (1907); *Âyurved Patrikâ*. (1906); *Journal of the Association of Medical Women in India* (1909); *Nursing Journal of India* (1910); *Boletim Geral de Medicina e Farmacia* (1912); *Indian Journal of Medical Research* (1913); and *Madras Medical Journal* (1913).

Tuberculosis

No society devoted to tuberculosis was founded in the 19th century. King George V Anti-tuberculosis League founded in Bombay in or before 1912 seems to be the first society of India exclusively devoted to the disease.

Engineering

Mysore Engineers Association (c1912) and Indian Engineering Association (c1913) are the two engineering associations started during the period. The former published *Proceedings* and the latter *Report*.

Mining

Sibpur Mining Society was formed around 1906 at the Bengal Engineering College, Sibpur. Mining and Geological Institute of India was also formed in 1906 [WoL]. These two seem to be the premier societies on the subject founded in India. Mining and Geological Institute of India started publishing its *Report* as well as *Transactions* from 1906.

Civil Engineering

Institute of Civil Engineers founded in Calcutta around 1909 seems to be the first society in India on the subject. The name of the Institute changed to Indian Society of Civil Engineers in 1911.

Automobiles

United Provinces Automobile Association was possibly formed during this period. It published *Indian and Eastern Motors* (1909).

Agriculture

Two agricultural societies seem to have started during this period. They are Bihar Planters' Association and Madras Agricultural Students' Union (c1912). From the periodicals brought out by the former, it appears that Bihar Planters' Association was established in 1906.

Animal Husbandry

Indian Kennel Gazette appeared from 1902 under the sponsorship of Kennel Club of India. From this, it is presumed that the aforesaid Club came into existence in 1902 or before at Yercaud, Madras.

Veterinary Medicine

Veterinary education in India started in late 1870s, veterinary periodicals in 1880s, and veterinary departments in 1890s [Sen: 82]. All these made the ground ready for the launching of an association like UP Veterinary Association which seems to have started in 1912 at Bash, Moradabad.

Dairy Science

Institutions devoted to dairying started appearing mostly from the first decade of the 20th century. Dairy Students Union came up in or before 1913 more or less as a natural consequence.

Textiles

Textile mills started emerging in British India in the 19th century itself. *Indian Textile Journal*, the first periodical on the subject from India started in 1890. *Textile and Engineering Directory of India* also started in the same year. The opportune situation prevailing at the time led to the starting of the Bengal Textile Institute at Serampore in 1904.

COMPANIES ETC

A number of companies related to technology was established in this period. The companies were: Kumardhubi Pottery Works (1905), Tata Iron and Steel Co. (1907), Philadelphia Homeopathic Supply Agency, Hutti (Nizam's) Gold Mines Ltd (c1909), Philanthropic Pharmacy (c1909), Zandu Pharmaceutical Works Ltd (1910), Gujchem Distilleries India Ltd (1911), and G G Dandekar Machine Works Ltd (1912) Some of the companies brought out periodicals.

PERIODICALS

First periodicals on various subjects

The period witnessed the birth of first periodicals in many subjects. The chronological distribution of the subjects are as follows: Castor crops (1901), cotton spinning and weaving (1901), kennel (1902), therapeutics (1902), electricity (1903), pumping (1905), microbiology (1905), smoke nuisance (1906), agricultural botany (1906), automobiles (1907), sericulture (1907), reclamation (1907), iron and steel (1907), fisheries (1907), coal (1907), forest chemistry (1908), forest economy (1908), forest geology (1908), forest zoology (1908), agricultural mycology (1909), malaria (1909), gold mining (1909),

bicycles (1910), food (1910), genetics (1910), nursing (1910), cattle (1911), physics (1911), ambulance (1911), forest botany (1911), agricultural bacteriology (1912), crop cutting (1912), tuberculosis (1912), and economic botany (1913).

Growth

With the starting of new periodicals every year, the growth has been always positive during the period. The year 1902 recorded minimum growth with a tally of 13 and the year 1913, the maximum growth with a tally of 45. On average, every year has given birth to 33 periodicals. The years 1905, 1906, 1907, 1912 and 1913 are highly productive inasmuch as they have given birth to 40 periodicals per year or more. The high productivity of the years 1905, 1906 and 1907 is due to two factors, i.e. establishment of a number of agricultural experiment stations which produced reports, and the formation of the new state of Eastern Bengal and Assam in 1905, many of whose S&T departments brought out reports. Similarly in 1912, the new state of Bihar and Orissa was created slicing Bengal, and a number of agricultural experiment stations were set up. Many S&T departments were established in the new state that brought out reports, new agricultural experiment stations also brought out reports, moreover forecast of various crops added to the tally of the years 1912 and 1913. As to the number of various types of periodicals, reports top the list with a tally of 172 followed by journals (154), data periodicals (56) and proceedings (12). Other types of periodicals accounted for 35 titles.

3. SCENARIO 1914 - 1938

We have seen in the earlier chapter that the growth of periodicals has been pretty smooth during 1901-13 and around 430 periodicals emerged in 13 years, averaging 33 periodicals per year. The figure has been highly encouraging. The political, educational, scientific and technological developments that took place, all proved to be conducive to the development of periodicals. The period under discussion i.e. 1914-1938, also witnessed all types of developments, which are being discussed below:

POLITICAL DEVELOPMENT

The greatest political event of the period is the World War I (WWI) that started in 1914 and ended in 1919, causing many periodicals to close down temporarily or permanently and others to emerge. The WWI had a major impact on Indian

industries. The aftermath of the partition of Bengal in 1905 engendered *swadeshi* movement throughout the length and breadth of the country. The movement provided enough momentum towards the development of all types of industries starting from simple match factories to sophisticated steel plant. Even during WWI Department of Industries came up in presidencies and provinces. The trend continued even afterwards. All the Departments of Industries started publishing periodicals usually in the form of reports.

DEVELOPMENTS IN GOVERNMENT SECTOR

The starting of government departments, constitution of various boards, committees, commissions, etc went on unabated during this period as well. In the 19th century the presidencies and states started departments related to land records, survey and settlement, chemistry, geology, public health, mining, public works, railways, roadways, agriculture, irrigation, forestry, horse breeding, veterinary medicine etc. Many states that did not start these departments earlier started some of these according to their needs. In addition, many new departments such as industry, electricity, broadcasting also came up. Moreover, many committees, commissions, bureaus, boards, etc also were formed which are being briefly discussed below.

Statistics

Army Statistical Organisation of the Government of India brought out *Report on the Health of the Army in India* from 1937. From this, it appears that the Organization was established in or before 1937.

Revenue

The Board of Revenue of the Government of India maintained some chemical laboratories in 1930s. Hence, the Board finds a place here though it is not a scientific department.

Industry

Following the first partition of Bengal on 16th October 1905, intense political movement started in Bengal. opposing the partition. Gradually the movement spread all over India. One of the major spin-offs of the movement was the birth of *swadeshi* concept, which urged people to boycott foreign goods. The

swadeshi movement soon stimulated indigenous enterprise in many fields (SBI). These developments led to the establishment of industries departments in many states and the Centre in the following chronological order, United Provinces and Oudh (1915), Bengal (1916), Mysore (1916), Bombay (1918), Central Provinces and Berar (1918), Bihar and Orissa (1920), Hyderabad (1920), Travancore (1920), India (1921), Punjab (1924), Assam (1924), and Orissa (1936).

It is also to be noted that the Government of India appointed Indian Industrial Commission in 1916 to survey the subcontinent's industrial development, which was fuelled up by India's *swadeshi* movement. In 1918 the Commission urged the Government to promote applied research. The Government took steps only in 1934 to set up the Central Industrial Intelligence and Research Bureau [Rajagopalan et al: 6].

Municipal Department

The state of Bihar and Orissa started the Municipal Department in or before 1918. This Department finds a place here as it used to publish *Annual Return of the Lunatic Asylums in Bihar and Orissa*.

Corporation

Calcutta Corporation also figures here for its periodical *Biological Investigation of Water Purification of Plants*.

Geology

Many states started this department earlier. Travancore, Rewa State and Hyderabad started this department respectively in or around 1921, 1923 and 1929. In the case of Hyderabad, it was known as Hyderabad Geological Survey.

Archaeology

Three states, e.g. Hyderabad, Cochin, and Baroda started their archaeological departments respectively in or before 1914, 1926 and 1935. All these departments brought out periodic publications.

Entomology

A title called *Bulletin, Entomological Research Factory, Maihar* has been encountered. The *Bulletin* is dated 1918. From this it is clear that the Factory existed during this period.

Public Health

Starting from 1860s, office of the sanitary commissioners, public health departments etc have been established in various presidencies, provinces and states. The provinces and states which did not have these departments or offices earlier started during this period. It is to be noted that Portuguese India also started such a department in or before 1916. Delhi and Mysore states also started the department/office respectively in or before 1926 and 1929. Bombay started the Board of Public Health Works in or before 1933.

Pharmacology

Just after the conclusion of the World War I, the Government of India appointed Drugs Manufacture Committee to find out the pros and cons of drug manufacture in India.

Engineering

The Public Works Department of Bengal, which was functioning since 1860s started an Engineering Branch in early 1930s. The Branch brought *Annual Report* in 1930s.

Electricity

Power development in India started at the fag end of the 19th century with the commissioning of electricity supply in Darjeeling during 1897, followed by the commissioning of a hydel power station at Sivasamudram in Karnataka during 1902. Till 1947, power supply was mainly in the private sector [India 2001: 458]. The departments related to electricity started coming up from mid-1920s. According to our records, Punjab went ahead with the starting of Hydroelectric Branch of Public Works Department in 1925. It started the Electricity Branch of PWD in mid-1930s. North-Western Frontier Province started the Department also around mid-1930s. Central Water and Power Commission had its Power Wing in or before 1937.

Broadcasting

Broadcasting started in India in 1927 with two privately owned transmitters at Bombay and Calcutta. The Government of India took over the transmitters in 1930 and started operating them under the name of Indian Broadcasting Service. The name was changed to All India Radio in 1936 and to Akashvani in 1957 [India 2001: 264] The Research Department of All India Radio was started in

1937 [Rajagopalan et al: 295]. It brought out the periodical *Ionospheric Data* for sometime.

Mining

Mining operation during the British period started in early 19th century. In fact, coal mining started in 1820 [CHSI: 564]. However, no presidencies, provinces or states started the department of mining in the 19th century. The appointment of the Committee on the Dangers arising from Coal Dust in Indian Mines around 1924 was an important event. This was followed by the formation of Indian Coal Grading Board a few years hence.

Defence

In 1917, keeping in view of the need of the raging War, Indians Munitions Board was created to expedite the production of war material [SBI 2: 362]

Civil Engineering

Most of the presidencies and states already had public work departments before this period. Baluchistan started the Department in 1919 and the Government of India added Public Works Branch to the Department of Industry and Labour presumably in 1920s. North-West Frontier Province added Buildings and Roads Branch in 1914, and Bihar and Orissa in 1924.

Railways

Mysore started Railways Department in or before 1919. Railway Board constituted Bridge and Structures Standards Committee, and Carriage and Wagon Standards Committee in or before 1922. In 1930, the Central Standards Office for Railways was set up to prepare standard designs and specifications for the Indian Railways. [Rajagopalan et al: 307].

Irrigation

Public Works Department of the Bombay Presidency set up in 1916 the Special Irrigation Division. It was converted into Hydrodynamic Research Station in 1920. In 1937 it was taken over by the Central Government and named as Central Irrigation and Hydrodynamic Research Station. Around 1942, it was renamed as Indian Waterways Experiment Station. Early in 1948 the Station was transferred to the control of the Central Water Power Irrigation and Navigation Commission and the Station was named as Central Water Power, Irrigation and Navigation Research Station [Rajagopalan et al: 297]. Since 1939, the Station has been bringing out a periodical with generic title *Research*

Publications. Another important government organization that came up during the period in the Central Board of Irrigation. It was founded in 1927 [*IYW* 1945/46: 326] and became Central Board of Irrigation and Power at a later date. Bihar and Orissa also started the Irrigation Department in or before 1924 and Bengal in 1930. United Provinces of Agra and Oudh added Irrigation Branch to its Public Works Department in 1931. Bombay had its Poona Irrigation and Research Division in or before 1933, Bengal started its River Training Works subdivision in or before 1934.

Automobiles

General Motors erected their assembling plant in Bombay in 1928. Soon after, the Ford Motor Company also established plants in Bombay, Calcutta and Madras [*WoI* - Industrial Products Pt I: 110]. These developments heralded the era of the fabrication of motor cars in India and made the situation ripe for the establishment of Motor Vehicles Department in India. The Government of Bombay started the Department in or before 1936. No other presidency, province or state seems to have started the Department till 1947.

Agriculture

The most important event of the period in this sphere is the appointment of Royal Commission of Agriculture in India in April 1926. It was appointed 'to examine and report on the existing conditions of agriculture and rural economy of British India and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population' [*IY* 1929: 330]. The Commission commenced its work in October 1926 and published the Report in two volumes and Evidences in 13 volumes. The recommendations of the Commission undeniably had a far reaching impact on Indian agriculture. Following the recommendations of the Commission, Imperial Council of Agricultural Research (ICAR) was founded in 1929, specialists were appointed in many fields, and departments were set up in many states. With the passage of time many agricultural research institutions came up in various parts of India. Other events include the establishment of the Department of Agriculture, by Hyderabad (Deccan) (1914), Gwalior (1916), Cochin State (c1919), Bhopal (c1927) and Sind (1930). The Government of India established Military Farms Department probably in 1925 and Office of the Marketing Advisor in 1936.

Soil Survey, Reclamation

Documentary evidences indicate that work on reclamation, soil survey, etc started in India only after World War I. Punjab started its Reclamation Department in mid-1920s and Mysore started Soil Survey in or before 1934

Farming

Experiment with dry farming also started during the period. Bombay was the first to undertake a dry farming research scheme in early 1930s, which continued for about 10 years.

Crops

Various crop committees were established during 1914-38. Indian Central Cotton Committee was the first to be established. It was established in 1918 and then added its Technological Laboratory in 1924 [Rajagopalan et al: 387-8]. In 1930s appeared Indian Tea Licensing Committee (c1933), Indian Coffee Cess Committee (1930)[Internet], Indian Tea Cess Committee (c1935), and Indian Central Jute Committee (1936) [ICJC 1937 – 39]. Bengal started a rice research scheme around mid-1930s. The Board of Agriculture and Animal Husbandry in India added its Crops and Soils Wing in 1935.

Horticulture

Agri-horticultural societies, fruit research stations, etc were established in many places in India till 1930. However, there was no department exclusively devoted to horticulture. Mysore filled in this gap when it started the Department of Horticulture in or before 1931.

Forestry

Work on forestry that started in the 19th century continued in the 20th century as well. However, the period under review did not see much new activities except that work on forest administration started in Ajmer-Merwara and North-West Frontier Province in mid-1920s. The Mysore Sandal Spike Investigation Committee was set up in or around 1930.

Animal Husbandry

In this case also, not many new activities were observed. The General and Revenue Department of Mysore established a Livestock Section, and the Board of Agriculture and Animal Husbandry in India also added an Animal Husbandry Wing, both in early 1930s.

Veterinary Medicine

New activities were not much. Baluchistan started Civil Veterinary Department in or before 1915 and Hyderabad (Deccan) started Stud and Veterinary Department around mid-1920s.

Dairying

Some new activities were observed in this field. Military Dairy Farm of the Government of India and Coimbatore Agricultural College Dairy were set up in 1920s, and the Imperial Dairy Expert was appointed by the Government of India in mid-1930s.

Lac

The Government of Bihar and Orissa appointed a Special Officer of Lac Inquiry in or before 1930 who brought out the Report of Lac Inquiry during 1930 – 1934.

Fisheries

Madras, Punjab and Bengal started their individual Fisheries Department during 1901- 1913. Two more states, i.e. Bombay and Baroda started the Department in late 1930s.

Printing

Office of the Chief Controller of Printing and Stationary of the Government of India started bringing out *Annual Report* of the Government of India presses from around mid-1930s. The date of founding of the Office could not be ascertained.

Aviation

The carrying of a bag of message by an aircraft in February 1911 from Allahabad to Naini Junction heralded the beginning of air transport in India. After this incident practically nothing happened till 1925 to sustain air transport. Indian Air Board, constituted by the Government of India, submitted a memorandum in 1926 giving a number of specific recommendations. Following the recommendations Directorate of Civil Aviation was created in January 1927 [Acharyya: 10-12] Civil aviation in India made its debut with the inauguration by J R D Tata of the Tata Airlines in 1932. The Airlines flew mail and passengers between Karachi, Ahmedabad, Bombay, Bellary and Madras.[SBI 1:34-35.]

Chemicals

Chemical Services Committee was possibly established by the Government. of India in 1920. No more information could be gathered about the Committee.

EDUCATIONAL DEVELOPMENT

UNIVERSITIES

The first decade of the 20th century did not see the establishment of any new university. From the second decade, the establishment of the universities picked up pace, and in 1920s, almost every year saw the establishment of one university. The universities appeared in the following chronological order: Benares Hindu University (1915); University of Mysore (1916); SNDT Women's University (1916); Osmania University (1918); Aligarh Muslim University (1920); Jamia Milia Islamia (1920), Dacca University (1921); University of Lucknow (1921); University of Delhi (1922); University of Nagpur (1923); Andhra University (1926); Agra University (1927); Annamalai University (1928); and Travancore University (1937).

UNIVERSITY DEPARTMENTS

With the establishment of the universities, S&T departments also started emerging. A bare listing of some of those departments is given below subject-wise that usually conducted research and brought out publications.

Psychology

University of Lucknow started the department in 1929, followed by Aligarh Muslim University in 1932. University of Calcutta started the Department of Applied Psychology in 1938.

Statistics

University of Travancore was established in 1937. Shortly after its establishment it started the Department of Statistics. Possibly, this university is the first in India to start the department on statistics.

Science

Journal of the Department of Science, University of Calcutta was started by the University in 1919. From this it is presumed that the Department was started in 1919 or earlier.

Mathematics

Annamalai University started the Department of Mathematics in 1929 to impart teaching and undertake doctoral and post-doctoral research [Rajagopalan et al: 555].

Physics

University of Calcutta started the Department of Applied Physics in 1925 and Annamalai University started the Department of Physics in 1928.

Chemistry

Several universities started the Department. They are: University of Calcutta (1914), Osmania University (1919), University of Lucknow (1921), Annamalai University (1929), and Andhra University (1932).

Geology

University of Calcutta started the Department in 1917, followed by University of Madras (1934), Andhra University (1941) and University of Lucknow (1943).

Ocean Sciences

University of Travancore betrayed its far-sightedness in establishing the Department in 1938. A few other universities started the department years later.

Marine Biology

In this case also University of Travancore showed foresightedness in establishing the Department in 1938. Marine biology gradually gathered importance in the years that followed. The Department's aim was to conduct research on marine biology and marine fauna. [Rajagopalan et al: 608]

Anthropology

Patna University started the Department in 1938. No other university seems to have started the Department till 1947.

Botany

Quite a few universities started this Department. They are: Aligarh Muslim University (1923), University of Lucknow (1923), and University of Punjab (1929').

Zoology

University of Saugar started the Department in 1938.

ining

University of Calcutta added Mining Engineering Section to the Department of Geology, Mining and Metallurgy in 1923.

Chemical Technology

Benares Hindu University started the Department of Industrial Chemistry in 1921, and University of Bombay went for the Department of Chemical Technology in 1934.

It may be noted from above that some of the universities started the rather common departments of physics, chemistry, botany and so on. But a few went for uncommon departments such as applied psychology, applied physics, ocean sciences, marine biology, and industrial chemistry.

COLLEGES, INSTITUTIONS, ETC

Colleges of science, medicine, technology, engineering, and agriculture are included, usually only those colleges are listed which brought out some periodic publications or conducted research. The list is not exhaustive.

Science

Several science colleges started during the period. Karnatak Science College (1919); Science College, Bankipur, Patna (1927); and JVD College of Science and Technology, Waltair (1932) are some of them.

Technology

Harcourt Butter Technological Institute, Cawnpore (1921) over the years has become an important technological institution for study and research. It also brings out periodic reports.

Medicine

A number of medical colleges started during the period including those on Ayurveda, homeopathy and Unani. Some of them are listed here in chronological order: Women's Christian Medical College, Ludhiana (1915); Lady Harding Medical College and Hospital for Women and Children (1916); King George Medical College (1918); Carmichael Medical College (1920), King Edward Memorial Hospital and Sunderdas Medical College (1923), Andhra Medical College (c1927), Prince of Wales Medical College, Bankipore, Patna (1928); Vizagapatnam Medical College (c1928); Stanley Medical School (@College) (c1933); Patna Medical College (c1934). Some of these colleges brought out periodic publications like journals, bulletins, annual reports and so on.

Hygiene and Public Health

All India Institute of Hygiene and Public Health was established in 1932 in Calcutta to train leaders in the science of public health at postgraduate level, to develop research programmes and methodology tailored to the needs of India; and to develop modern service programmes and conduct operational research in service programmes [Rajagopalan et al: 260-1]. The Institute has been bringing out its *Annual Report* since 1933/34.

Ayurveda

Ayurvedic colleges have also been recorded. Three of them are: Astanga Ayurveda Vidyalay (1916); Ayurved Mahasammelan Vidyapeeth (1931); and Tilak Ayurved Mahavidyalaya (1937).

Homoeopathy

Sinha Homoeo Medical College and Hospital (c1929) seems to be the only homoeopathic college started during the period.

Unani

Bharat Tibbia College, Saharanpur (1932) also seems to be the only college in Unani medicine started during the period.

Dentistry

Nair Hospital Dental College, Bombay (1915) seems to be one of the earliest colleges in India started on the subject.

Engineering

Some of the engineering colleges started are: College of Engineering, Bangalore (1917), Engineering College, Benares Hindu University (1920), College of Engineering and Technology, Jadavpur (1921), Bihar Engineering College, Patna (1924), and University College of Engineering, Osmania University (1929).

Mining

Indian School of Mines and Applied Geology (1926) is possibly the earliest school started on the subject in India.

Agriculture

Compared to medicine, the number of agricultural colleges is less. The colleges that started during the period are: Cawnpore Agricultural College (1924), Agricultural College and Research Institute, Coimbatore (1930); College of Agriculture, BHU, Benares (1931); and College of Agriculture, Pune (1936).

Leather Technology

College of Leather Technology (1919) seems to be the first college in India on the subject.

SCIENTIFIC ORGANIZATIONS

Museums

Of the museums started during the period, two are important from scientific point of view. Patna Museum started in 1917 and Orissa State Museum in 1932. The museums possessed among others objects of archaeology, natural history, and anthropology.

Science

Two important institutes originated during the period. Bose Research Institute was founded in Calcutta in 1917 by Acharya Jagadish Chandra Bose for fuller investigation of the many ever opening problems of the nascent science which includes both life and non-life. In 1950, the Institute was renamed as Bose Institute. It started bringing out *Transactions of the Bose Research Institute* from 1918. [Rajagopalan et al : 507] Royal Institute of Science founded in Bombay in 1920 was formally opened on 27 March 1924. In February 1950, the Institute was renamed as Institute of Science. It brings out *Annual Report* [Rajagopalan et al : 574].

Statistics

The starting of the Indian Statistical Institute by P C Mahalanobis in 1931 was a great event in the history of statistical research in India. The Institute by virtue of its valuable contributions in the subject earned world-wide recognition and its journal *Sankhya* (1933) also became one of the topmost journals in the field.

Geology

The establishment of geological surveys that started in the mid-19th century in India continued in the 20th century as well. The state of Travancore set up the Survey in this period and started bringing out the *Records of Geological Survey, Travancore* from 1921.

Meteorology

The British established a number of observatories all over the country during the 18th, 19th, and 20th centuries to conduct meteorological, seismic, astronomical and other studies. A meteorological observatory was also established by the Portuguese at Nova Goa in this period which started bringing out the summary of its observations from 1927 or before.

Archaeology

The period witnessed the establishment of Archeological Survey of India (ASI) for Jammu and Kashmir State, as well as the Central Circle of ASI. The *Annual Report* of the former started in 1917/18 and of the latter in 1919/20. Archaeological Survey of India, Kashmir also started bringing out its *Annual Report* from 1924.

Biochemistry

Biochemical Standardization Laboratory founded in Calcutta in 1937 is perhaps the first biochemical laboratory to be established in India. It started bringing out its *Annual Report* from 1937. The Laboratory continued functioning beyond 1947 with changed name.

Zoology

Zoological Survey of India was established in Calcutta in 1916 to act as the custodian of the national zoological collection; to identify zoological specimens for various institutes and organizations; to obtain fullest possible information on systematic ecology and zoogeography of India; to publish zoological journals, etc [Rajagopalan et al: 244]. The Zoological Garden at Lahore was established around 1930.

Industrial Research

The British Government established Department of Industries in presidencies, provinces, and states during 1907 to 1936. Some princely states also followed suit. Towards the end of this period, it was realized that research support was needed to sustain the growth of industries and make them competitive in the world. Hence, Industrial Research Bureau was set up in 1934. This was converted to Board of Scientific and Industrial Research in 1940, and to Council of Scientific and Industrial Research in 1942 [Rajagopalan et al: 6].

Medicine

Two organizations that have been recorded during the study are: All India Conference of Medical Research Works (c1928) and Indian Institute of Medical Research (IIMR). IIMR was founded on 1 January 1935 as a non-government research institution. In April 1956 it was taken over by the Council of Scientific

and Industrial Research and the name was changed to Indian Institute of Experimental Medicine [Rajagopalan et al: 34]. The name was changed once again afterwards to Indian Institute of Chemical Biology. The Institute has been contributing high quality research papers since inception in national and international journals and publishing its *Annual Report*.

Health and Hygiene

Beri Beri was a big killer in certain parts of India. To combat the disease Beri Beri Enquiry was initiated. The Beri Beri Enquiry unit gradually took the shape of the Nutrition Research Laboratories in 1918 at Coonoor. Later on, the institute was shifted to Hyderabad and name changed to National Institute of Nutrition. Gram Sangathan Institute established at Bolpur in or before 1912 had a Medical Department. This Department was responsible for the birth of the Bengali periodical *Svastha Niketan*. Ross Institute of Tropical Hygiene and Public Health was set up in Calcutta in 1932. Institute of Child Health also was established around the same time.

Public Health

Some of the hospitals that were set up during the period are: Junagarh Rasukhanji Hospital (c1922), King Edward Memorial Hospital, Bombay (c1928), Carmichael Hospital for Tropical Diseases, Calcutta (c1929), Sinha Homeo Medical College and Hospital, Lahriasarai, Darbhanga (c1929), and Najafgarh Health Unit (1937). Several lunatic asylums/mental hospitals were also established. Three of them are: Ranchi European Lunatic Asylum (1918), Indian Mental Hospital, Ranchi (1924) and Punjab Mental Hospital (c 1935). The Public Health Laboratory was established in 1928.

Pharmacology

Serum Institute was established in 1932. Possibly this was the first institute on serum established in India.

Pathology

Bhaskaran School of Pathology established in 1925 also seems to be the first institute of India on the subject.

Malaria

During 1901-1913, the Malaria Institute of India (1909), Imperial Malaria Committee (1910) and Malaria Bureau (1913) were set up. The trend continued

afterwards as well. In 1920s two Field Malaria Laboratories were established in Bengal- one at Sonapur and the other at Krishnagar.

Virology

The establishment of virological institutes continued as before. Government Vaccine Institute and Pasteur Institute was founded at Namkum, Ranchi in 1914 [Rajagopalan et al:], and King Edward VII Memorial Pasteur Institute and Medical Research Institute (' & Pasteur Institute and Medical Research Institute) at Shillong in 1915 (WoL 2002: 734). Afterwards Pasteur Institute and Medical Research Institute was established at Shillong in 1917. Pasteur Institute was also established in Calcutta in 1920s.

Tropical Medicine

Calcutta School of Tropical Medicine was founded in 1921 to assist and advice medical practitioners, institutions, government and other organizations on various problems relating to tropical diseases; to provide postgraduate courses of instruction under the Calcutta University; etc. [Rajagopalan et al: 825]

Ophthalmology

Hospitals solely devoted to eye or ophthalmology did not appear in large number in the country till 1947. Two such hospitals have been recorded, i.e. Government Ophthalmic Hospital (c1921), and Aligarh Eye Hospital Trust (c1937). Later on the Trust grew into the Institute of Ophthalmology of Aligarh Muslim University.

Electrical Engineering

Power generation in India commenced at the end of the 19th century with the commissioning of power supply in Darjeeling in 1897, followed by the commissioning of a hydel power station at Sivasamudram in Karnataka in 1902. [India 2001:458] To ascertain the power generation potential of the country Hydroelectric Survey of India was founded in 1919. Irrigation and Power Research Institute was founded at Amritsar in 1924 to help solve complicated problems that arise during implementation and running of big river valley projects. [Rajagopalan et al: 431].

Hydraulic Engineering. Irrigation

Several institutes on irrigation were established during 1926 to 1933. They are Irrigation and Power Research Institute, Amritsar (1924) mentioned above; . Irrigation Research Laboratory, Punjab (c1927), Irrigation Research Station, Roorkee (c1930), and Irrigation Research Division, Poona (c 1933).

AGRICULTURE AND RELATED DISCIPLINES

The founding of Indian Council of Agricultural Research in 1929 was a big event in the history of agricultural research and development in India. The Council has been responsible not only for establishing a chain of agricultural research institutions in the country but also publishing quite a few agricultural periodicals of high quality. In this period two agricultural laboratories were also founded - Agricultural Research Laboratory (c1918) at Gwalior and Vivekananda Laboratory in Almora in 1927. The Vivekananda Laboratory was founded by Dr. Boshi Sen, a renowned biologist [Rajagopalan et al: 485]. Exists till date with changed name.

Agricultural Statistics

Imperial Council of Agricultural Research added a small Statistical Section in 1930 to assist the agricultural officers in planning the field experiments and analyzing the experimental data. In 1948, the Section was raised to the status of a Branch, and in 1959 the Branch became a full-fledged institute called Institute of Agricultural Research Statistics, Delhi. [Rajagopalan et al: 122]

Agricultural Stations and Farms

It has already been mentioned that about fifty agricultural stations and farms were founded during 1901-1913. The trend no doubt continued but the number came down sharply to about 15 during 1914-1938. Practically, no agricultural station was founded during 1933-1938. The stations/farms that were founded are as follows: Sirvel Agricultural Station (c1914); Agricultural Research Station, Hiriyur (1916) Agricultural Research Station, Nagenhalli (1917); Agricultural Research Station, Nanjanad (1917); Kumta Agricultural Station (c1917); Jacobabad Experimental Station (c1919); Guntur Experimental Station (c 1922); Agricultural Research Station, Mugad (1923); Agricultural Research Station, Marteru (1925); Agricultural Farm, Palakkuppam (1926); State Agricultural Farm, Berhampore (1928); Agricultural Research Institute, Rajendranagar

(1928); Agricultural Experiment Farm, Sirsa (c1929); Agricultural Stations at Gurdaspur (1929), Hansi (1929), and Rawalpindi (1929); Chakanwali Agricultural Station (1929); Montgomery Agricultural Station, Punjab (c1929); Seed and Experimental Farm, Sargodha (1929), Agricultural Research Station, Rudrur (1931/32); and Agricultural Research Station, Poondi (c 1932). Some of these stations/farms brought out periodic publication in the form of Reports. The list may not be comprehensive.

Dry Farming

Possibly the vagary of monsoon and inadequate water supply in many parts of India enthused research workers to work on dry farming. One dry farming scheme was undertaken in Bombay in early 1930s and that continued for about ten years. Punjab Dry Farming Research Station was also started in or before 1936 and continued for about four to five years.

Pest Control

No agricultural research is complete without research on pest control. Almost as a natural consequence, one Locust Research Laboratory was established in early thirties. Possibly it did not last long.

Crops

The agricultural stations established during 1901 –1913 were by and large general in nature and not devoted to specific crops. During 1914-1938 more than a dozen stations were established with emphasis on specific crops such as betel vine, coffee, cotton, groundnut, jute, millet, potato, rice, rubber, sugarcane, tea and tobacco. A brief description of the stations follows:

Betel Vine

Even a crop like betel vine did not escape the attention of the British. One station was established even for this crop at Vellalur in Coimbatore District in mid-1920s. The Station brought out *Annual Report* during 1925/26 to 1928/29.

Coffee

Three stations were established in the following chronological order. Coffee Planting Experiment Station, Sidapur (1921); Coffee Experiment Station, Balehonnur (1925) and Mysore Coffee Experiment Station (c1930).

Cotton

The Institute that deserves special mention is the Institute of Plant Industry. It was established in 1924 at Indore to conduct research in cotton genetics and in the improvement of cotton and rotation crops (WoL2002). It has been responsible for bringing out four periodicals. Two cotton breeding stations were also established, one at Kovilpatti (c1926) and the other one at Coimbatore (c1928).

Groundnut

Groundnut did not receive much attention in the 19th century, possibly it was not one of the staple foods. In the 20th century till 1947, it did receive some attention and the Groundnut Experiment Station was established at Palkkuppam in 1926. Later on, the Station was shifted to Tindivanam and upgraded to Regional Agricultural Research Station [Rajagopalan et al :452]..

Millet

The cultivation of millet is not widespread in India. Neither it is widely used as a staple food in the country. Possibly because of this it did not receive much attention earlier. However, one research station, called Millets Breeding Station was established in mid-1920s.

Potato

The importance of potato as a potential food item was realized more in the 20th century. Hence, Seed Potato Farm was established at Nanjanad in or before 1920. The Farm brought out its *Report* during 1920s.

Rice

Rice is the crop that received great attention from the British. It is, therefore, natural that as many as eight research stations were established during 1926 to 1935. The stations are: Breeding Stations at Aduturai, Coimbatore, Maruteru, and Pattambi. All the stations were established most probably in 1926 and brought out *Reports* during 1926/27 – 1928/29. In addition, Rice Research Station, Berhampur (c1933); Deep Water Paddy Research Station, Habiganj (c1934); Rice Research Station, Nagina (c 1934); and Rice Research Station, Sabour (c 1935), were also set up. All these stations also brought out *Reports*.

Rubber

Experiments on rubber plantation started in India in 1920s. Rubber Planting Experiment Stations at Mooply and Tenmalai were started almost simultaneously in 1921 or earlier. United Planters Association of Southern India also established a Rubber Experiment Station in mid-1920s.

Sugarcane

As a crop, sugarcane also attracted the attention of the British to a great extent from the 19th century itself. In or around 1932, Sugarcane Research Scheme, went into operation at Padegaon. In mid-1930s, they established Sugarcane Research Station at Anakapalle, Shahjahanpur and Jorhat. In addition, Sugarcane Seedling Research Station was started at Dacca.

Tea

Tocklai Experiment Station was started in 1911 to conduct research on tea. Afterwards, Tea Planting Experiment Station was started in Peermale in 1921 or before. United Planters Association of South India established the Tea Research Institute in 1925. In 1935, Tocklai Experiment Station was expanded with the starting of Chemical, Mycological, Botanical and Bacteriological Branches.

Tobacco

The British started tobacco operations in Ghazipur and Pusa in 1880s [Sen: S159]., They started Sidapur Tobacco Station in or around 1921 and Cigarette Tobacco Research Substation in 1936 [Rajagopalan et al:].

Horticulture

Several Fruit Research Stations were started during the period. In chronological order, they are: Pomological Station at Simis Park, Coonoor (c1920), Government Hill Fruit Research Station (1932); Fruit Research Station, Kodur (1936); Fruit Research Station at Sabour (c 1938), and at Ha.sarghata (c 1938).

Forestry

Forest Research Institute, Dehra Dun, widened its activities by starting its Economic Branch as well as its Timber Department Branch in 1936. Forest Research Laboratory started in or before 1938 added one more dimension to forest research.

Animal Husbandry

The establishment of Imperial Institute of Animal Husbandry and Dairying in 1923 was a major step to provide impetus to animal husbandry and dairying encompassing training, research and extension. The Institute exists till date with the changed name National Dairy Research Institute. Buffalo Breeding Station, Guntur and Central Cattle Farm, Hissar were also started around the same time.

Sugarcane Technology

On the recommendation of Indian Sugar Committee (1920), the Government of India established the Imperial Institute of Sugarcane Technology in October 1936 at Cawnpore by taking over the Sugar Section of the Harcourt Butler Technological Institute along with its staff [Rajagopalan et al:]. After independence, the name of the Institute changed to Indian Institute of Sugarcane Technology and thereafter to National Sugar Institute.

Cotton Technology

In 1924, Indian Central Cotton Committee established the Technological Laboratory in Bombay to help agricultural departments in evaluating the quality of the new strains evolved; to help the trade and industry by furnishing true valuation of different trade varieties cultivated; to carry out basic research in physical and chemical properties of cotton in relation to quality and spinning performance; etc.[Rajagopalan et al:] Afterwards the name of the Laboratory was changed to Cotton Technological Research Laboratory and then to Central Institute of Research on Cotton Technology.

Jute Technology

As a fibre, jute ranked next only to cotton, and in jute production, India was second to none. Moreover, jute was having both national and international market. In such a situation, taking care of technological aspects of jute, was but an absolute necessity. Jute Technological Research Laboratories came up in Calcutta in 1938 to carry out research on jute, mesta and other long vegetable fibers for the assessment and improvement of fibre quality; economic processing of the fibers; better utilization of agricultural bye-products; diversification of fibre products from physical, chemical and technological aspects etc.[Rajagopalan et al: 125]

SOCIETIES, ASSOCIATIONS, ETC.

Apart from general ones, societies sprang up during this period on such subjects as Psychology, Industry, Science, Natural History, Wild life preservation, Mathematics, Astronomy, Physics, Chemistry, Geology, Archaeology, Anthropology, Biology, Microbiology, Biochemistry, Botany, Zoology, Entomology, Medicine, Physiology, Health and hygiene, Public health, Pharmacology and pharmacy, Radiology, Ayurveda, Homoeopathy, Pathology, Clinical medicine, Tuberculosis, Leprosy, Cancer, Pediatrics, Nursing, Dentistry, Dermatology and venereology, Malaria, Surgery, Ophthalmology, Obstetrics and gynaecology, Engineering, Mechanical engineering, Electrical engineering, Mining, Railways, Roadways, Ports, Automobile engineering, Aeronautics, Agriculture and related disciplines, Soil science, Crops, Cotton, Plantation crops, Tobacco, Forestry, Animal husbandry, Cattle, Horses, Poultry, Veterinary medicine, Apiculture, Lac, Chemicals, Soaps, Sugar technology, Ceramics, Metallurgy, Architecture, Cinematography, and Geography. Most of the societies brought out periodicals. One society on Religion and another on Cooperatives have been included here as they also published scientific periodicals.

GENERAL

Here are included such research societies as are devoted to many disciplines including some disciplines of science. Three societies have been recorded here. Bihar and Orissa Research Society was established in 1915. Possibly this Society became Bihar Research Society when Bihar and Orissa were separated in 1936. Bhandarkar Oriental Research Institute (1917) has been an important institution devoted to orientology. The objectives of the Institute among others are to publish critical editions of texts and original works bearing on oriental antiquities; to train students in the methods of research and to act as an information bureau on all points connected with oriental studies [IY 1941/42:441] The third society is the Assam Research Society founded in 1930s. All these Societies brought out periodic publications.

Psychology

Two associations have been recorded. Indian Psychological Association was formed in 1926 or before, and Calcutta Psychical Society in early 1930s. Indian Psychological Association started the periodical *Indian Journal of Psychology* in 1926

Religion

A society devoted to religion is a surprise inclusion here. General Conference on Seventh Day Adventists find a place in this study since it was responsible for bringing out the famous journal *Oriental Watchman and Herald of Health*.

Cooperatives

A society on cooperatives is also a surprise inclusion here. This is because Gujarat Pradesh Sahakar Sangh (c1930) was responsible for the journal *Gram Jivan, Sahakariya and Kheti*. The journal was partially devoted to agriculture.

Industry

This is the period when industrial development started gaining momentum in India. A number of states started the department of industry. A large number of industrial enterprises sprang up and naturally more than half a dozen industrial associations emerged on the scene. Some of them are: The Federation of Indian Chamber of Commerce and Industry (1927)[TID 1967:436]; Bombay Chamber of Commerce and Industries; All India Village Industries Association; Association for the Development of Swadeshi Industries; Association of Indian Industries; Madhya Pradesh Millowner's Association (1932)[Joshi:24]; Southern India Millowner's Associations (1933)[Joshi:23] Bengal Millowners' Association (1934) [Joshi:24]; and All India Industrial Federation.

SCIENCE

This period is remarkable in the history of science in India, as it saw the emergence of Indian Science Congress Association (1914), Academy of Sciences of the United Provinces of Agra and Oudh (1930)[later on renamed as National Academy of Sciences], Current Science Association (1932), Indian Academy of Sciences, Bangalore (1936), and National Institute of Sciences in India (1935) [later on renamed as Indian National Science Academy]. All these associations, academies, etc. were founded by the stalwarts of Indian science like C V Raman, M N Saha and many others. Some of the other societies that came up during the period are: Tamil Scientific Terms Society (c1916); Academy of Aryan Science, Madras (c1921); Science Association, Maharaja College, Vizianagram (c1923); Anjumane Tarrqui Society (c1928); Patna Science College Philosophical Society (c1931), Muslim Association for the Advancement of Science (c1931); Scientific Society, Harcourt Butler Technological Institute (c1935); Indian Science News

Association (c1935); and Sridhapur Vijnan Mandir (c1938). Most of these societies brought out important periodicals.

Natural History

It seems that Darjeeling Natural History Society was formed in 1926. From around 1940, the name of the society changed to Bengal Natural History Society. *Journal of Darjeeling Natural History Society* (1926) [later on *Journal of the Bengal Natural History Society*] continued for more than 40 years. Sind Natural History Society started in or before 1929. It also brought out a journal.

Wild Life Preservation

The initiative to preserve wild life was observed in 1890s through the formation of Nilgiri Game and Fish Preservation Association. The initiative did not last long. One more attempt was made in 1930s through the formation of All India Conference for the Preservation of Wild Life. This organization also closed down prematurely.

Mathematics

With the onset of the 20th century, mathematical societies started emerging in India. The trend continued during this period as well. Benares Mathematical Society was formed in 1918 to encourage and promote research in various branches of pure and applied mathematics, and in the history of mathematics. [IY1941/42:441]. The *Proceedings* of the Society was brought out during 1919 to 1947. The Society continued functioning beyond 1947 with the changed name Bharat Ganit Parishad. The Allahabad University Mathematical Association was formed next possibly in 1927. Soon after its founding it started the journal *Bulletin of the Allahabad University Mathematical Association*.

Astronomy

Only one society, called All India Astrological and Astronomical Society has been traced. From the name, it appears that the Society was partially devoted to astronomy. The Society founded in or before 1927 started bringing out the journal *Ārya Jyotis* from 1927.

Physics

Indian Physical Society was founded in 1934 in Calcutta to promote and uphold the cause of physical science [WoL2002]. Possibly this was the first society on physics formed in India.

Chemistry

Indian Chemical Society was formed in 1924 in Calcutta with the initiative of Sir P C Ray who was the first President. The Society had branches in Bombay, Lahore and Madras [IY 194141/42:446]. In course of time the Society proved itself to be the most important society in India on the subject. *Quarterly Journal of the Indian Chemical Society* (1924) [later on *Journal of the Indian Chemical Society*] also has proved to be one of the most outstanding journals on chemistry from India. Other societies encountered are: Chemical Society of Muslim University, Aligarh (c1931); and Chemical Society, Allahabad University (c 1939).

Geology

Geological, Mining and Metallurgical Society of India was founded in 1924 in Calcutta to promote and encourage the study of geology, mining and metallurgy and to facilitate the meeting of persons engaged in the pursuit of geology, mining and metallurgy in India; to collect, publish and distribute information relating to geology, mining and metallurgy; and the establishment and development of Indian concerns connected therewith; etc [PMII:518]. Geological Society based at Presidency College, Calcutta is the other society noted. It was formed in 1936 or before.

Archaeology

Archaeological societies are appearing in India since mid-19th century. Three societies have been traced that originated during this period. They are: Hyderabad Archaeology Society (c1916); Allahabad Archaeology Society (c1935); and Archaeological Society, Junagarh (c 1937).

Anthropology

Only one organization called Indian Anthropological Institute has been traced. It was founded in Calcutta in or before 1938 and it brought out its *Journal* from 1936 till 1948.

BIOSCIENCES

Biology

The Association of Economic Biologists founded at Coimbatore in or before 1933 seems to be the first society from India on economic biology. The society brought out *Proceedings* and seemed to have existed for a short period.

Microbiology

Association of Microbiologists of India founded in 1938 at New Delhi seems to be the first association on the subject from India. The Society exists to date and brings out a journal [WoL2002:728].

Biochemistry

Society of Biological Chemists, India formed in 1930 is possibly the first society on biochemistry from India. It exists till date and brings out periodicals [WoL2002:729]. Another society called Biochemical Society of Calcutta started in 1934 and possibly closed down during World War II.

Botany

The Society founded during the period is Botanical Society of Bengal. It was founded by the noted agricultural scientist, Girish Chandra Bose, in 1935 in Calcutta for the dissemination of agricultural knowledge. [Internet: Banglapedia: Bose, Girish Chandra]. The Society started bringing out its *Bulletin* from 1947.

Zoology

Zoological Survey of India was founded in 1916 in Calcutta. In the same year Zoological Society of India was also formed in Calcutta. The Society exists to date and is bringing out its *Bulletin* since 1947.[WoL2002: 729].

Entomology

Entomological Society of India was founded in 1938 in Delhi. It started bringing out *Indian Journal of Entomology* from 1939.

MEDICINE

A large number of societies devoted to this subject were formed during this period. The societies in chronological order are: Bengal Council of Medical Registration (c1915); Poona Medical Society (c1916); Indian Provincial Medical Services Association (c1920); Hyderabad Medical Association (c1923); British Medical Association, Assam Branch (c1923); Mysore Medical Association (c1925); Indian Medical Association, Bihar State Branch, (c1923); Patna Medical Association (c1925); Sind Medical Union (c1927); South Indian Medical Union (c1929); Indian Medical Association (1928); Indian Medical Association, South Indian Branch (c1932); Gram Sangathan Institute, Medical Department (c1932);

Medical Council of India (1933); LIM Association (c1935), DIM Association (c1935); Indian Research Fund Association, Nutrition Advisory Committee (c1936); Medical College Reunion, Calcutta (c1937); and Punjab Medical Council (c1938).

Of all these societies, Indian Medical Association deserves special mention. It looks after the interest of medical professionals in the country; publishes its official organ *Journal of the Indian Medical Association* and brings out a few other periodicals. Medical Council of India (1933) is another important medical organization. It looks after the maintenance of uniform standards of medical education, reciprocity in mutual recognition of medical qualifications with other countries; and also of Indian Medical Register.

Physiology

Physiological Society of India founded in 1935 seems to be the first society on the subject formed in India [Koley and Sen]. It brought out its *Proceedings* for a few years. *Indian Journal of Physiology and Allied Sciences* was started by the Society in 1947.

Health and Hygiene

The Yoga Institute was founded in Bombay in 1918 to promote self-education, physical, mental, moral and psychic, aided by the science of yoga; and to conduct academic and scientific research in Yoga culture and technique [WoL2002: 736]. It publishes its journal called *Yoga*. Another society, called Indian Association for Mental Hygiene, started in or around 1930, continued for sometime. It also brought out its *Journal* for several years.

Public Health

Indian Red Cross Society was founded in 1920 with the object of taking care of the sick and wounded men of Indian forces as well as of those suffering from tuberculosis; child welfare; etc. [IPY 1949: 541]. The Society started bringing out *Annual Report* from the year of its foundation.

Pharmacy

Bengal Pharmaceutical Association formed in or around 1937 seems to be the first association on pharmacy from India. *Indian and Eastern Chemist* was the official organ of the society for sometime.

Radiology

Dr. Ajit Mohan Bose and Dr. Subodh Mitra founded the Indian Radiological Association in Calcutta in 1931. Later on, the Association functioned for sometime from Madras. Then it shifted to Delhi and then to Bombay. It started its official organ *Indian Journal of Radiology* in February 1947. In late 1980s, the name of the journal changed to *Indian Journal of Radiology and Imaging* [Internet: Radiology in India.].

Systems of Medicine

Ayurveda

Three societies devoted to Ayurveda have been traced. They are : Andhra Vaidhya Mandali (c1922); Nikhilotkal Vaidya Sabha (c1928); and Ayurved Samajamu (c1931). All the societies brought out periodicals.

Homeopathy

All the societies devoted to homoeopathy seem to have started around mid-1920s. The societies are: Indian Homeopathic Association (c1924), Homeopathic Society of India (c1924); and Homeopathy Serving Society (India) (c1927). All the societies were based in Bengal and brought out journals in Bengali.

Pathology. Clinical Medicine

Two societies have been traced. They are Clinical Society, Lucknow (c1918) and All India Medical Practitioners Association (c1930). Both the societies brought out journals which continued beyond 1947.

Cancer

Bengal Cancer Institute was formed in Calcutta in or around 1937 and continued beyond 1947. It brought out its *Journal*. Possibly, this is the first cancer society formed in India.

Dermatology and Venereology

Indian Association of Dermatologists and Venereologists founded in or before 1935 seems to be the first Indian society on the subject.. The society started the journal called *Indian Journal of Venereal Diseases* in 1935 which continued beyond 1947 with the changed title *Indian Journal of Venereal Diseases and Dermatology*.

Dentistry

All India Dental Association seems to have started in this period. Probably it is the first dental society in India. The *Journal* of the Society continued beyond 1947.

Leprosy

Indian Council of the British Empire Leprosy Relief Association, formed in or before 1929 might be the first organization on leprosy in India. The Association continued beyond 1947 with the changed name Indian Leprosy Association. It started the journal *Leprosy in India* in 1929 which continued beyond 1947.

Malaria

Central Cooperative Anti-malaria Society formed in 1922 or before might be the first society formed in India on the subject. The Society continued functioning beyond 1947 and published its *Report*.

Nursing

Lady Minto's Indian Nursing Association formed in 1919 or before continued functioning till 1946 and thereafter possibly closed. It brought out its *Report*.

Pediatrics

The Indian Pediatric Society formed in 1933 or before seems to be the first society on pediatrics from India. In cooperation with Institute of Child Health, it published *Indian Journal of Pediatrics* which continued beyond 1947.

Tuberculosis

Tuberculosis Association of Bengal formed in or around 1929 seems to be the first society formed in India on the subject. Probably, the Association closed down during World War II. It brought out its *Report*.

Surgery

Association of Surgeons of India was established in Bombay in 1938. Subsequently it moved to Madras. It started publishing its official organ *Indian Journal of Surgery* from March 1939. Possibly this is the first association on surgery established in India and existing till date. [WoL 2002: 728]

Ophthalmology

Quite a few societies have been found. Indian Association of Workers for the Blind founded in 1917 brought out the journal called *Light to the Blind* for about ten years. All India Ophthalmological Society founded in Madras in 1930 for the cultivation and promotion of the study and practice of ophthalmic sciences to render service to the community and to promote social contacts among ophthalmologists [WoL2002: 728] continues till date. It brings out *Indian Journal of Ophthalmology*. Aligarh Eye Hospital Trust founded in 1937 seems to have become Muslim University Institute of Ophthalmology from 1946. Association for the Prevention of Blindness, Bengal started in or before 1938 continued beyond 1947.

Obstetrics and Gynecology

Lady Chemsford All India League for Maternity and Child Welfare in India was founded in or before 1921 and continued beyond 1947. The League brought out the journal called *Maternity and Child Welfare in India*.

ENGINEERING

About half a dozen societies were founded. They are: Bombay Engineering Congress (1915), Institution of Engineers of India (1920), Institution of Engineers, Bombay Centre (c1921), Association of Engineers (c1925), Engineering Subordinates Association (c1928), Madras Local and Municipal Engineers Association (c1928), and India Society of Engineers (1934)[WL2002:729]. Bombay Engineering Congress continued for about thirty years and seemed to have closed down during World War II. Institution of Engineers of India continues till date with a little change in the title, and has been a very active engineering society in India. It brings out a number of journals. Association of Engineers also continued beyond 1947 and brought out its *Journal*. Engineering Subordinates Association founded in Lahore possibly was short-lived. It brought out the journal called *Engineering Herald* for two years. India Society of Engineers also continues till date and brings out the journal called *Science and Engineering*.

Mechanical Engineering

Mechanical Engineers Association founded in Bombay in or before 1919 seems to be the first Indian association on the subject. It continued beyond 1947 and brought out the journal called *Engineer*.

Electrical Engineering

Electrical Engineering Society formed in Bangalore in 1926 or before continued beyond 1947 and brought out the journal *Electrotechnics* till 1965.

Mining

Several societies were born, of which Association of Colliery Managers in India (c1914) was devoted to coal, KGF Mining and Metallurgical Society (c1920) to gold, Mining and Geological Society of India (c1922) to mining and geology, Indian Mining Association (c 1922) and Indian Mining Federation (c1931) to mining in general. Geological, Mining and Metallurgical Society of India (1924) [already described] was partially devoted to mining. Of the societies, Association of Colliery Managers in India, and KGF Mining and Metallurgical Society brought out *Transactions* and *Bulletins*, and the rest periodic reports and miscellaneous publications.

Railways

Railways Users Federation founded in or before 1925 in Madras brought out the journal called *Indian Railway Magazine*. The journal continued beyond 1947.

Roadways

Indian Roads and Transport Development Association formed in 1928 continued beyond 1947. Indian Roads Congress, the most important organization pertaining to roadways was founded 1934. It exists till date and publishes its *Journal*.

Ports

Port Trust, Bombay started bringing out the journal called *Port of Bombay* from 1933. The journal continued beyond 1947.

Automobiles

Automobile Association of South India was founded in or before 1919 It brought out *A.A.S.I. Magazine*. How long the magazine continued could not be ascertained.

Aeronautics

In late 1920s, aircraft started flying in India on commercial basis, and societies also cropped up. Indian Air League founded in or before 1927 was possibly the first society on aeronautical engineering in India. It published its *Bulletin*. Aero Club of India and Burma was the other society, formed in or before 1929. At a later date the name of the society was changed to Aero Club of India. Its *Journal* continued till 1934.

AGRICULTURE AND RELATED DISCIPLINES

In all, nine societies have been traced. In chronological order, they are: Birbhum Krishi Samiti (c1918), Mysore Agricultural and Experimental Union (c1919), Mysore Vyavasayika Mathur Parikshaka Sangha (c 1920), Bengal Agricultural Intelligence Club (c1923), Allahabad Agricultural Institute (c1925), Nikhil Bharat Krishi Samiti (c1927), Trichinopoly District Agricultural Association (c1930), Hyderabad Farming Association (c1931) and Agricultural College Students Union, Cawnpore (c1934).

Of these societies, Birbhum Krishi Samiti and Nikhil Bharat Krishi Samiti brought out short-lived journals in Bengali. The two societies were perhaps short-lived. Mysore Vyavasayika Mathu Parikshaka Sangha brought out a journal in Kannada, which continued beyond 1947 with change in title. The rest, brought out periodicals in English. Some of them are as follows. *Journal of the Mysore Agricultural and Experimental Union* (1919) continued till 1961. *Allahabad Farmer* started by Allahabad Agricultural Institute continued beyond 1947. The same is the case with the Agricultural College Students Union Magazine of Cawnpore. Periodicals by other societies were short-lived.

Soil Science

Indian Society of Soil Science founded in 1934 seems to be the first society on the subject in India. It brought out its *Proceedings* till 1949.

Crops

Cotton

Karachi Cotton Association was founded in or before 1933. It brought out *Karachi Cotton Annual* from 1933/34.

Plantation Crops

Indian Indigo Association was probably founded in 1920s. Possibly it closed down in this decade itself as indigo plantation practically stopped because of the import of synthetic indigo from abroad. United Planters Association of Southern India added the Scientific Department in early 1930s. Both the associations brought out periodic publications, i.e. *Proceedings* and *Bulletin*.

Tobacco

Indian Tobacco Association was formed in or before 1938. It brought out its *Bulletin* for sometime.

Forestry

Three associations have been traced. They are: Mysore Forest Association (c1918), Madras Forest Panchayats Union (c1926), and Bengal Forest Subordinate Services Association (c1938). Mysore Forest Association brought out *Quarterly Journal of the Mysore Forest Association* only for a year. Madras Forest Panchayats Union published *Rural India* for about six years and Bengal Forest Subordinate Services Association brought out *Bengal Forest Magazine* for three years. Thus, it can be seen that none of the journals brought out by these societies survived long possibly due to the lack of the adequate number of subscribers.

Animal Husbandry

Cattle

Two societies have been traced. All India Cow Conference Association existed in 1920s and brought out its *Annual Report*. Govardhan Sanstha established in or before 1927 continued beyond 1947 and published a Marathi journal called *Govardhana* devoted to cattle.

Horses

National Horse Breeding and Show Society of India was founded in 1923 by Major General Sir Bernard James who was its first President. The objectives of the Society were among others to improve and expand the breeds of horses, ponies and mules in India; and to protect and promote the interests of breeders [IPY 1949:540]. Its journal called *Horse Breeding* continued beyond 1947.

Poultry

United Provinces Poultry Association (c 1931) is the only society traced. The Association probably did not survive long. However, it brought out *Annual Report* during its existence.

Veterinary Medicine

All India Veterinary Association is the only society traced. The society changed its name to Indian Veterinary Association and continued beyond 1947. It has been publishing *Indian Veterinary Journal* since 1924.

Apiculture

All India Beekeepers Association was established in 1937 by Pandit Rajendra Nath Muttoo, a veteran beekeeper and researcher of that time at Jeolikota, Nainital. Afterwards the office of the Association shifted to Delhi. Presently it is located at Poona. It started publishing *Indian Bee Journal* from 1939. Possibly this is the first journal on beekeeping from India.[Internet].

Lac

Indian Lac Association for Research [*name changed to Indian Lac Research Institute in 1924*] was founded in Ranchi in 1921 to find out among others improved methods of lac cultivation; to manufacture better quality and stain of shellac; and to explore the possibility of additional uses of lac [WoL 2002; Rajagopalan et al: 119].

CHEMICAL TECHNOLOGY

Chemicals

In 1938, P. C. Ray brought together in Calcutta a group of industrialists including Rajmitra B D Amin, founder of the Alembic Group of Baroda, for promoting the interests of the nascent chemical industry. What began, as a vision, emerging from foresight and aspirations, turned into Indian Chemical Manufacturers Association [Internet]. It seems, initially the Association was called Chemical Manufacturers Association. The Association started bringing out its *Report* from 1938/39 and *News Sheet* from 1947.

Soaps

All India Soap Makers Association was founded in or before 1934. Later on, it was renamed as Indian Soap and Toiletries Makers Association. The Association brought out *Indian Soap Journal* (1934) which continued till 1972 with the changed title *Indian Oil and Soap Journal*.

Sugar

Sugar Technologists' Association of India was founded in 1925 and it started publishing its *Yearbook* from around 1930. Indian Sugar Mills Association was founded in 1932 in Calcutta. Its *Report* started coming out from 1933/34. The Deccan Sugar Technologists' Association (India) was established in 1936 with the initiative of Seth Lalchand. Its periodical publication *Proceedings and Technical Papers* started appearing from 1944 or before.

Ceramics

Indian Ceramic Society was founded in 1928 [WoL 2002 :729]. The Society continues to date and publishes its *Transactions*.

Metallurgy

K G F Mining and Metallurgical Society and Geological, Mining and Metallurgical Society of India have already been described. Both are partially devoted to metallurgy. Indian Institute of Metals was founded in 1938⁷ in Calcutta for the exchange and dissemination of metallurgical engineering thoughts and ideas, and for the promotion and advancement of the study and practice of the art and science of making, shaping and treating of metals and alloys. [Prog: 520]. It started publishing its *Quarterly Journal* from 1938.

OTHERS

Architecture

Indian Institute of Architects was founded in 1929. It continues till date. The Institute started publishing *Journal of the Indian Institute of Architects* from 1934.

Cinematography

Motion Picture Society of India was founded in or before 1935. It started publishing its *Journal* from January 1935.

Geography

Three societies have been traced. Madras Geological Association was formed in 1926 or before. At a later date, the name of the Association changed to Madras Geographical Association. It published its Journal under various names. Curzon Geographical Society was formed in Aligarh most probably in 1926. The Society seemed to have been very short-lived and brought out two issues of the journal called *Geographer*. Geophysical Society of India founded in Calcutta in 1933 exists till date. It brings out a quarterly journal called *Geographical Review of India*.

COMPANIES ETC

The companies that brought out periodicals are listed according to subjects of the periodicals they brought out.

Industry

Tata Publicity Corporation, Bombay brought out in 1920s a journal on industry called *Industrial India*.

MEDICINE

Dalvar Chemical Co., Dinapur started a Hindi journal on medicine called *Daktar Bhai* in 1935. The journal continued beyond 1947.

Pharmaceuticals

Bengal Chemical and Pharmaceutical Works Ltd started bringing out *Advance Therapy* from 1928. The periodical continued beyond 1947.

Ayurveda

Ayurvedashram Pharmacy Ltd, Ahmedabad brought out from 1917 the journal called *Bhiṣagvilās* in Marathi. The journal continued till 1958. Andhra Ayurvedic Pharmacy Ltd brought out *Andhra Medical Journal* from 1923 to 1930. Swarna Salsa Oushadhalay, Dacca published a Bengali monthly called

Cikitsak from 1924 for sometime. Sind Ayurvedic Pharmacy brought out a Gujarati monthly titled *Arogya Sindhu* from around 1925. The periodical continued beyond 1947.

Homoeopathy

Hahneumann Publishing Co, Mitra Pharmacy and Economic Pharmacy, all from Calcutta started publishing monthly journals on homoeopathy titled respectively *Hahnemann* (May 1918), *Homiopathik Samâcâr* (1926), and *Homiopathik Cikitsâ* (1928). Of the three journals *Hahnemann* continued beyond 1947, but the other two did not survive long. M Bhattacharrya & Co, a famous homeopathic concern of Calcutta started an English monthly on homoeopathy called *Homoeopathic Herald* in 1938. The journal continued beyond 1947.

Unani

Both Hamdard Davakhana and Bara Davakhana of Delhi started journals on Unani medicine called *Hamdard-a-Sehat* (1932) and *Tibbi Dunia* (1936). Both the journals were in Urdu and continued beyond 1947.

ENGINEERING

Martin Bum Ltd started its house magazine called *Martin Burn House Magazine* in 1933. The magazine continued beyond 1947.

Radiocommunication

With the introduction of broadcasting in India in late 1920s, radio companies also sprang up. Bombay Radio Company Ltd started a journal called *Bombay Radio News* in 1933 which closed down in or after 1937.

Automobiles

Industrial and Trade Publications Pvt. Ltd, Delhi started publishing *All India Motorist* from 1929. It continued beyond 1947.

AGRICULTURE

Tea

Periodicals on tea started appearing from 1870s in India. East India Tea Co also started bringing out its *Report* from late 1920s.

PRINTING

Kubera Enterprises Ltd (c1933) brought out the periodical called *Printindia* from 1933. The periodical continued beyond 1947.

CHEMICAL TECHNOLOGY**Chemicals**

Indian Oxygen and Acetylene Co started a journal called *Indoxco* in 1935. Possibly the War did not allow the journal to continue beyond 1937.

Cement & Concrete

Cement Marketing Co of India Ltd started publishing *Indian Concrete Journal* from 1927. The Journal continued beyond 1947. Associated Cement Co Ltd also started bringing out its *Annual Report* from 1936.

Metallurgy

Indian Iron & Steel Co Ltd was established at Burnpur in Bengal in 1919 [India 2001: 508]. However, it started publishing its *Report* from 1938 or before.

Textiles

Delhi Cloth and General Mills Co Ltd started bringing out the Hindi weekly called *Delhi Cloth Mill Patrika* from 1931. It continued beyond 1947.

PERIODICALS**First periodicals on various subjects**

The period saw the birth of first periodicals in subjects like physical exercise (1915), lac (1921), dentistry (1925), ceramics (1928), physiology (1928), mental hygiene (1930), agricultural marketing (1930/31), school health (1931), broadcasting (1933), epidemic diseases (1933), marriage hygiene/sexology (1934), paper (1934), soap (1934), and cancer (1937).

Growth

About 940 periodicals (Journals – 458, Reports – 315, Data periodicals – 38, Proceedings – 42, and Others – 88) started in 25 years spanning the period from 1914 to 1938. On average, about 38 periodicals appeared per year. In the

previous period (1901 –1913), the average has been 33 periodicals per year. From these two figures it may appear that the World War I did not have much impact on the growth of periodicals, which is not true. From 40-odd new periodicals in 1913, the number dropped down to 30 in 1914, 18 in 1915, 23 in 1916 and 19 in 1917. The growth started peaking up from 1918 onwards and continued till 1938 sometimes touching the figure 60 or beyond. The highest number reached is 66 in 1929. This is due to the appointment of a number of specialists such as fodder specialist, agricultural bacteriologist, agricultural chemist, cerealist, entomologist, fruit specialist, millet botanist, mycologist, oilseed botanist, poultry expert, etc especially by the Government of Punjab. All these specialists submitted their reports in 1929, which added to the inflation of the figure. Moreover, the number of other periodicals started in the year is also quite substantial. It might be the aftermath of the recommendation of the Royal Commission of Agriculture.

4. SCENARIO 1939 – 1947

POLITICAL DEVELOPMENT

The period saw the biggest War the world has ever experienced. It started in 1939 and continued till 1945 causing incalculable destruction of property, loss of millions and millions of human lives, complete destruction of Hiroshima and Nagasaki and substantial destructions of hundreds of towns and cities, and untold miseries to human beings in major part of the world. The War affected directly or indirectly the entire globe. Though India was not directly involved in the War, but it experienced the effect of the War in many ways. During this period the struggle for freedom became more intense than ever before leading to India's long-looked-for independence on 15 August 1947 with the sorrowful partition of India and exodus of refugees.

The War caused cessation of a number of periodicals as well as disturbance in the regularity of the publication of many. It is interesting to note that despite Britain's direct involvement with the War, and highly disturbed political situation in India, periodicals continued to appear though in less number.

DEVELOPMENTS IN GOVERNMENT SECTOR

New departments, boards, committees, commissions, etc continued to be established despite the War. A brief description of them is given below.

Land Records

From the periodical *Standard Outturn per Acre of Crops in Central Provinces and Berar* that started in early 1940s it appears that Central Provinces and Berar had the Department of Land Records in 1940s. Possibly this Department became Directorate of Land Records after independence.

Industry

The Government of India started the Department of Commerce and Industry in early 20th century. In late 1940s, it also had the Ministry of Industry and Supply. Bombay started the Department of Industries around 1918, possibly after the World War I. Afterwards, it started the Section called Cooperative Development, Industrial Cooperatives and Village Industries Section (c1947) which was partially devoted to industries. Both brought out periodicals.

Physics

Council of Scientific and Industrial Research (1942) set up Radio Research Committee (c1945) for conducting ionospheric research. It brought out the data periodical called *Ionospheric Data* for about a decade. All India Radio also started Radio Research Department (c1945). This was also responsible for bringing out the aforesaid periodical.

Geology See Mining

TECHNOLOGY

All India Council for Technical Education was set up in 1945 as an advisory body by the Government of India to regulate the establishment of professional institutions and the courses offered by them and to uphold high

degree of academic excellence and professional competence [Dasgupta and Rao: 60]. It started bringing out the *Proceedings* of its Meetings from 1946.

Trademarks

Trade Marks Journal was started by the office of the Trade Mark Registry in 1943. From this it appears that the office of the Trade Mark Registry existed during the period. The date of starting of the office could not be ascertained.

Public Health

Government of India set up All India Nutrition Board and Department of Health in 1940s, and subsequently Ministry of Health in 1947. Government of Orissa also set up the Office of the Director of Health (c1939). All these organizations brought out periodicals.

Systems of Medicine

Ayurveda

General Council and State Faculty of Ayurvedic Medicine, Bengal was set up 'in or before 1940 for the registration of Ayurvedic practitioners in Bengal. For sometime it published *Annual Registration List of Ayurvedic Practitioners*.

ENGINEERING

Electricity

The Governments of Madras, Orissa and Travancore started their respective Electricity Departments in 1940s. The Government of India also set up Central Electricity Commission around 1947.

Broadcasting

Broadcasting started in Calcutta and Bombay in 1927 through private initiatives. Subsequently it came under the government control. The Government of Madras started the Broadcasting Department around 1940.

Mining

During this period Coal Mines Stowing Board (c1939); Rescue Stations Committee, India; and Indian Coalfields Committee (c1946) were set up. The Government of Hyderabad also set up Department of Mines and Geological Survey (c1942).

Railways

Railway Inspectorate (c1941) was started during the period and it started bringing out *Report of the Chief Government Inspector of Railways on the Working of the Railway Inspectorate*. Eastern Railway started publishing *Eastern Railway Magazine* in this period.

Irrigation

The State of Jaipur started Irrigation Department in or before 1943 which brought out its *Administrative Report* for some years.

AGRICULTURE

The Department of Food of the Government of India started bringing out the journal called *Nutrition* from 1945.

Agricultural Chemistry

The Chemical Section was added to the Department of Agriculture, Mysore in 1947 or before. It brought out its *Report*.

Pests and Diseases

The Government of India set up the Directorate of Plant Protection, Quarantine and Storage in 1946. The Directorate as usual started bringing out its *Report*. The first Report was for the years 1946/51.

Crops***Cocoanut***

Indian Central Cocoanut Committee was established in 1945 for the development of cotton cultivation in India. The Committee published its *Annual Report, Proceedings of its Meetings and Bulletin*.

Coffee

Indian Coffee Board set up its Research Department in or around 1947. The *Annual Report* of the Department started coming out from 1947.

Jute

Indian Central Jute Committee initiated an agricultural research scheme in late 1930s. The *Report* of the Scheme came out during 1939/40 – 1948/49. The Committee also started Economic Research and Publicity Section in early 1940s. In 1943 Economic Research Section and Publicity Section were separated. The periodicals brought out by the Section/s were *Bulletins* and *Reports*.

Oilseeds

Indian Central Oilseeds Committee was established in 1946 for the overall development of the oilseed crops. The Committee brought out its *Annual Report* from 1947 till 1964/65 when the Committee was dissolved.

Sugarcane

Indian Central Sugarcane Committee was formed in 1944 to look after the overall development in the sugarcane cultivation in India. The Committee brought out its *Annual Report* till its closure in 1965.

Tobacco

Guntur Tobacco Market Committee was possibly set up in 1941 and closed down before long. The Committee brought out *Bulletins*. Indian Central Tobacco Committee was established in 1945 and closed down in 1965. It brought out *Annual Report* regularly during the period of its existence.

Veterinary Science

The Government of Sind started the Civil Veterinary Department in or before 1941 following the example of other states. The Department brought out its *Report* for a few years.

PRINTING

Printing and Stationery Department of the Government of India seems to have started bringing out its *Administrative Report* from 1941. The date of establishment of the Department could not be ascertained.

AVIATION

Directorate of Civil Aviation was established by the Government of India in 1926, the Department of Communication in 1937 and the Civil Aviation Department (CAD) possibly in 1947. The CAD started bringing out *Monthly Newsletter on Civil Aviation in India* from 1947.

CHEMICAL TECHNOLOGY**Fuel**

Council of Scientific and Industrial Research appointed Fuel Research Committee in 1947⁷ The Committee started bringing out its Report from 1947.

EDUCATIONAL DEVELOPMENT

Due to the War, the development has been rather slow. Still, the period saw the establishment of universities, science colleges, university departments of mathematics, physics, chemistry, geology, biochemistry, botany, zoology, colleges of technology, colleges of pharmacy/pharmacology, Ayurvedic college, college of nursing, dental college, engineering colleges, agricultural colleges, college on forestry, colleges on veterinary science and animal husbandry, and college of ceramic technology.

UNIVERSITIES

Utkal University (1943), University of Saugar (1946), Panjab University (1947), and the University of Rajasthan (1947) started during the period.

UNIVERSITY DEPARTMENTS

Many university departments relating to science and technology were started in this period. The subject-wise listing of the departments follow. Here only such

departments have been listed as have brought out periodic publications or conducted research or did both. In some cases research in the departments started after 1947. University of Travancore started the Department of Research in 1939 or before. It is not claimed that the list is exhaustive. The departments have been arranged in the order: Mathematics, Physics, Chemistry, Geology, Biochemistry, Botany and Zoology.

Mathematics

The University of Delhi set up a separate Department of Mathematics in 1947. Later on Statistics was also included and the name of the Department was changed to Department of Mathematics and Statistics.

Physics

University of Saugar started the Department of Physics in 1946 with the inception of the University. The postgraduate section started in 1947 and research section in 1952. The newly constituted Panjab University started the Department of Physics in 1947. Initially the Department started functioning from the University of Delhi. In 1958 it was shifted to Chandigarh where the newly constituted Panjab University was housed.

Chemistry

University of Travancore started the Department in 1939 as a research and testing division. In 1956 it turned into a University Department with the provision for teaching and research [Rajagopalan et al: 608]. University of Saugar started the Departments of Chemistry in 1946 and Panjab in 1947 after partition.

Geology

Several universities started Departments of Geology such as Andhra University (1941), University of Lucknow (1943), University of Nagpur (1946), and Patna University (1946). Research facilities in these Departments started with the passage of time [Rajagopalan et al].

Biochemistry

Nagpur University started the Department of Biochemistry in 1946/47 for postgraduate studies and research [Rajagopalan et al: 632].

Botany

Botanical laboratories in Andhra University were first set up as a Section of Technology for teaching pharmaceutical botany in 1937. In 1942, the degree course (B Sc) in botany was started that continued till 1946 when a full-fledged Department of Botany came up offering 3-year Honours course and M Sc course by research. [Rajagopalan et al: 549-50]

Zoology

University of Delhi founded the Department of Zoology in 1947 offering B Sc course in the subject. M Sc courses started in 1952. [Rajagopalan et al: 584]

COLLEGES

A number of colleges started during the period. Some of them are listed here in the following order: Natural Sciences, Technology, Medicine, Pharmacy, Ayurveda, Nursing, Dentistry, Engineering, Agriculture, Forestry, Veterinary Science and Animal Husbandry, and Ceramics.

Natural Sciences

Erskine College of Natural Sciences was established in 1941 at Waltair. The College still exists and is affiliated to Andhra University.

Technology

Osmania University, Hyderabad started the University College of Technology in 1943. In 1944, a college came up at Guindy in Madras with the munificence of Dr R M Alagappa Chettiar, and grant from the Government of India and the University of Madras. Possibly the name of the College initially was Alagappa Chettiar College. Afterwards the name changed to Alagappa Chettiar College of Technology. B Tech and M Tech courses

were introduced in the College from 1961 and 1962 respectively [Rajagopalan et al: 863].

Medicine

A number of medical colleges were established in this period. Sarojini Naidu Medical College and Hospital, Agra was established in 1939 followed by Christian Medical College, Vellore (1942); Medical College, Amritsar (1943); G R Medical College, Gwalior (1945); B J Medical College, Poona (1946); Darbhanga Medical College (1946); Medical College, Guntur (1946); Sri Ramchandra Bhanj Medical College (c1946); Assam Medical College (1947); and Medical College, Nagpur (1947). Sarojini Naidu Medical College and Hospital, Agra used to bring out *Annual Report*.

Pharmacy

The Department of Pharmacy was established in 1944 in the University of the Punjab, Lahore. After partition, the Department started functioning at the Medical College and Khalsa College, Amritsar. In 1959, the Department moved to Panjab University, Chandigarh [Rajagopalan et al:643]. Lallubhai Motilal College of Pharmacy was established in 1947 at Ahmedabad with a generous donation from Sheth Shri Lallubhai Motilal. In 1951 it was affiliated to Bombay University, and thereafter to Gujarat University [Rajagopalan et al: 796].

Ayurveda

Government Ayurvedic College came into being at Jaipur in 1947 to impart Ayurvedic education [Elhence et al]

Nursing

College of Nursing was set up in New Delhi in 1946 to impart education on nursing and related areas.[WoL2002:751]

Dentistry

Government Dental College and Hospital was established in Bombay in 1945 to conduct B D S and M D S courses.

Engineering

A few colleges of engineering also started. The colleges are: College of Engineering, Trivandrum (1939); Birla Engineering College, Pilani (1947); Government Engineering College, Jabalpur (1947); and Punjab Engineering College, Chandigarh (1947). Birla Engineering College, Pilani started publishing the journal called *BECMAG* since the inception of the College.

Agriculture

A few agricultural colleges also started during 1939-1947. The colleges are: Agricultural College, Bapatla (1945); College of Agriculture, Bangalore (1946); College of Agriculture, Hyderabad (1946); Agricultural College, Dharwar (1947) and S K N College of Agriculture, Jobner (1947). College of Agriculture, Bangalore started publishing its *Technical Bulletin* since the inception of the College.

Forestry

Indian Forest Rangers College was established at Dehra Dun in 1946⁷. The College since its inception is bringing out its *Annual* magazine.

Veterinary Science and Animal Husbandry

U P College of Veterinary Science and Animal Husbandry was established in 1947 at Mathura to provide training on veterinary science and animal husbandry at Masters degree level. The College has also facilities for conducting research for PhD degree. [Rajagopalan et al:771]

Ceramics

Bengal Ceramic Institute was founded in Calcutta in 1941 to impart training in different branches of ceramics. In 1962, a four-year integrated B Sc (Tech) course in ceramic technology was introduced when the name of the Institute was changed to College of Ceramic Technology. The Institute started the journal called *Ceramics* in 1959.

SCIENTIFIC ORGANIZATIONS

Scientific organizations that appeared during the period number about 100 and pertain to such subjects as museology, psychology, transport, standardisation, science, astronomy, hydrology, palaeobotany, hydrobiology, anthropology, technology, industrial research, medicine, immunity, nutrition, pharmacology, cancer, engineering, civil engineering, irrigation, agriculture, farming, pests and diseases, cotton, jute, rice, sisal, sugarcane, fruits, animal husbandry, poultry, veterinary science, sericulture, fisheries, chemical engineering, fuel, paper, textiles, jute technology, wool, and concrete. The organizations pertaining to these subjects are being described following the same order starting with museology.

Museology

Several museums have come into being in this period. They are: Government Industrial and Commercial Museum (1939), Pudukkottai State Museum (c1939), Assam State Museum (1940), and Baroda State Museum and Picture Gallery (c1943). Pudukkottai State Museum brought out its periodic *Report* for sometime in 1940s. Baroda State Museum and Picture Gallery started bringing out its *Bulletin* from August 1943.

Psychology

On psychology, two organizations have been recorded, i.e. Institute of Psychological Research and Service, Patna University (1945), and Bureau of Psychology, Allahabad (1947). Conducting research has been one of the objectives of both the organizations

Transport

Indian Waterways Experiment Station was set up in or before 1945. The Station brought out its *Technical Report* for a few years in mid-1940s.

Standardization

Indian Standards Institution was established in 1947 in New Delhi shortly after independence with the active support of industry, and scientific and technical organizations. It started quite a few periodicals including *ISI Bulletin* in the years that followed. [Rajagopalan et al:285].

SCIENCE

Quite a few organizations devoted to science came into being during 1939–1947. Deccan College Research Institute was established in or before 1939 and it started bringing out its *Bulletin* from 1939. Board of Scientific and Industrial Research that started in New Delhi in 1940 became Council of Scientific and Industrial Research in 1942. This organization has been responsible for the starting and sustenance of a large number of high quality research and popular periodicals in the second half of 20th century [Rajagopalan et al: 6]. Central Laboratories for Scientific and Industrial Research was started at Hyderabad in 1942. Its name was changed to Regional Research Laboratory in 1956 and subsequently to Indian Institute of Chemical Technology. The Institute started bringing out its *Annual Report* since its inception. Raman Research Institute was started by Sir C V Raman in 1943 in Bangalore. It started publication of its *Memoirs* from 1953. Tata Institute of Fundamental Research was established in Bombay in 1945 with the initiative of Dr H J Bhabha, and financial support of the Sir Dorabjee Tata Trust and the Government of Bombay [Rajagopalan et al: 525]. The Institute contributes every year a large number of high quality research papers to numerous international and national journals.

Astronomy

Astro-Research Bureau came into being in 1942 in Calcutta with the object of propagating principles of scientific system of astronomical calculations in India. The Bureau started its publication activity with the launching of the periodical *Indian Ephemeris*. [Rajagopalan et al: 968].

Physics

The foundation stone of National Physical Laboratory was laid by Pt Jawaharlal Nehru on 4 January 1947. The Laboratory was formally opened by Sardar Vallabhbhai Patel on 21 January 1950. It has been contributing every year a large number of research articles to numerous national and international journals. University College of Science, Calcutta started its Ionospheric Laboratory in mid-1940s. The Laboratory published the periodical *Ionospheric Data* from 1945 to 1954.

Hydrology

Two institutes have been recorded. River Research Institute, Bengal came into existence in 1943 at Calcutta to help the state government in the formulation and execution of various schemes and projects through investigation and research. It brings out publications in the form of a series. Central Groundwater Organisation seems to have started in this period.

Palaeontology

Institute of Palaeobotany was established at Lucknow in 1946 through the untiring efforts of Prof Birbal Sahni, F R S. After his death on 11 April 1949, the Institute was named as the Birbal Sahni Institute of Palaeobotany. The Institute carries out original research and contributes papers in renowned journals [Rajagopalan et al:506]

BIOSCIENCES

Freshwater Biology Station was established at Chetput in Madras in 1942 to study the biology and trend of commercial fisheries in impounded waters etc. The Station has subsequently shifted to Bhavanisagar.

Anthropology

In 1945 Anthropological Survey of India was created out of the Anthropological Section of the Indian Museum. Ever since its inception it has been carrying out anthropological investigations of all the peoples of India.

TECHNOLOGY & INDUSTRIAL RESEARCH

Laxminarayan Institute of Technology was founded at Nagpur in 1942 with the donation received from Shri R B D Laxminarayan to impart training and conduct research in chemical engineering and technology. Another organization called Jiwaji Industrial Research Laboratory was founded in 1947. It has taken the shape of Defence Research and Development Establishment in 1973.

MEDICINE

Kamyab Institute of Medicine started the Urdu journal *Magribi Tibb* in 1947 from Meerut.

Immunity

Bengal Immunity Research Institute was established in Calcutta in 1947 for conducting research on chemotherapy of bacterial diseases, organotherapy, nutrition, standardisation of drugs and pharmaceuticals; etc. [Rajagopalan et al: 934]

Pharmacology

Drug Research Laboratory was established in 1941 at Jammu by the Jammu and Kashmir Government. It was taken over by the Council of Scientific and Industrial Research in 1957 and renamed as Regional Research Laboratory, Jammu. The Drugs Laboratory at Baroda was established in 1947 to analyse samples under the Drugs and Cosmetics Act – 1940 of the Government of India as a statutory requirement. [Rajagopalan et al: 377].

Cancer

Tata Memorial Hospital was founded in 1941 to provide treatment to cancer patients in the country. During 1965/66 Cancer Research Institute and Tata Memorial Hospital conjointly formed the Tata Memorial Centre.

ENGINEERING

Three institutes have been recorded. Hyderabad Engineering Research Laboratories was founded by the State of Hyderabad in 1945 for providing necessary analytical and experimental assistance to the Public Works Department. After the formation of Andhra Pradesh in 1956, the name of the institute was changed to Andhra Pradesh Engineering Research Laboratories.[Rajagopalan et al: 341]. Mysore Engineering Research Station was established at Krishnarajasagar in 1945 to advise and assist the Krishnarajasagar Dam authorities in finalising the designs and salient features of the project after conducting necessary model studies; to conduct

chemical analysis of materials; etc [Rajagopalan et al: 425]. National Institute of Engineering, Mysore was founded in 1946 to run Diploma Course in Civil Engineering. Over the years, the Institute has grown into one of the premier institutions of engineering education in south India.[Internet 6 June 2004].

Civil Engineering

Three institutes have been recorded. P W D Building and Road Research Laboratory was established at Lahore in 1944. After the partition a laboratory with the same name was started at Karnal and finally shifted to Chandigarh. It conducts applied research on buildings and roads, disseminates expert knowledge to the engineers, etc. [Rajagopalan et al: 432]. UPPWD Research Institute came into being in 1946 at Lucknow to undertake testing of materials, to find solutions of various engineering problems, etc. [Rajagopalan et al: 489]. Soil Engineering Research Station, Chepauk also seems to have started in 1946. It brought out its *Annual Report* during 1946 – 1952.

Hydraulic Engineering & Irrigation

Three institutes came up during the period. Irrigation Research Station was established at Poondi in 1944 when Poondi Regulator was constructed across river Kasathalaiyar for augmenting Madras City water supply. The Institute brings out its *Annual Report* [Rajagopalan et al:471]. UP Irrigation Research Station was established at Bahadradab in 1947. The name of the Station was changed to UP Irrigation Research Institute in 1949. It brings out its *Annual Report on Research in Progress*. [Rajagopalan et al: 488]. Bhakra Dam Project Laboratory was founded at Nangal in 1947 to carry out various investigational activities required by the Bhakra Dam Project.

AGRICULTURE AND RELATED DISCIPLINES

Apart from the Institute of Agriculture, Anand (1939), nearly a dozen agricultural stations were established during this period at Bagwai (1940), Jaipur (1943), Vijapur (1944), Kankanady (1945), Ambalabhayal (1946), Nargund (1946), Annigere (1947), Bailahoyal (1947), and Kumta (1947). All these institutes has been conducting research and generating research papers.

Farming

Report of the Hyderabad Dry Farming Research Scheme, Raichur appeared for the year 1942/43. It appears that the Scheme was launched around that time.

Pests and Diseases

Three institutes have been recorded. Plant Virus Research Centre was established by the Imperial Council of Agricultural Research in 1939. Later on the name of the Centre was changed to Plant Virus Research Laboratory [Rajagopalan et al 112]. In 1947 one Parasite Breeding Station was started at Razole in East Godavari District, and another at Nasrapur in West Godavari District. The Station at Nasrapur closed down in 1950 [Rajagopalan et al: 707].

Crops

Coconut

Regional Coconut Research Station was established at Kumarakom in 1947 by the Indian Council of Agricultural Research to conduct research on cultural and manurial requirements of cocoanut [Rajagopalan et al: 392].

Cotton

Cotton Research Station was started at Nanded by the erstwhile Hyderabad State in 1941. After the reorganization of states, the Station came under the jurisdiction of Maharashtra. Ever since it has been the main cotton research station in Maharashtra with five regional and ten substations [Rajagopalan et al : 408]. Cotton Development Scheme was launched at Diphu in north-east India in 1947 with the financial assistance of the Indian Central Cotton Committee to find out high-yielding and more linted variety of short staple cotton, best cropping pattern, and so on.

Jute

Jute Agricultural Research Institute was established at Dacca in 1939 by the Indian Central Jute Committee. After partition the Institute went within

the jurisdiction of Pakistan. Hence, another Institute with the same name was started at Nilganj, Barrackpore in 1948 [Rajagopalan et al: 124].

Rice

A number of institutions devoted to rice came up during 1939 –1946 at Bankura (c1939); Chinsurah (c1939); Kayamkulam (1939); Moncompu (1940); and Tirurkuppam (1942). The Moncompu Station was initially known as Paddy Breeding Station. Another Paddy Breeding Station was set up at Kankanady in 1945. The establishment of the Central Rice Research Institute at Cuttack in 1946 by the Government of India was a major event on rice research in India.

Sisal

Sisal is a tropical plant that grows in India, and its fibre is used for making ropes, floor coverings, etc. Considering the economic value of the plant, Sisal Research Station was established during 1943/44.

Sugarcane

Considering the importance of sugar in the world, quite a few institutes devoted to sugarcane was established by the British in India. One of them is the Central Sugarcane Research Station, it was established at Pusa, Bihar in 1941. The *Annual Report* of the Institute was published during 1947/48 – 1951/52.

Tobacco

Tobacco has been one of the important cash crops of India. Hence adequate importance was given to the crop by the British. In this short period also two institutes came up. Tobacco Experimental Station was set up at Madhira in 1945, and Central Tobacco Research Institute at Rajahmundry by the Indian Central Tobacco Committee in 1947. The Institute is the apex body in the case of tobacco research in India.

Turmeric

Turmeric powder is widely used as a spice in Indian subcontinent and many other parts of the world. Considering its high economic potential, Turmeric Research Station was established at Cuttack before independence. The *Annual Report* of the Station has also been published for sometime.

Wheat

Powarkheda Agricultural Farm which was started in 1903 was converted to Wheat Research Station in 1942/43.

Horticulture

Two Fruit Research Stations have been recorded. Both seem to have started in 1921. One was started at Sangareddy and the other at Hyderabad.

Animal Husbandry***Livestock***

Composite Livestock Farm and Research Station, Hessarghata seems to have originated from one of the Military Farms that were established before and after the World War I. The Farm came under the control of the Department of Animal Husbandry and Veterinary Services, Mysore in 1947 since then the Farm has been developed into the Composite Livestock Farm and Research Station [Rajagopalan et al: 422].

Poultry

Two poultry research stations have been traced. The Station at Nandanam, Madras was established in 1941, and the other one at Mukteswar in 1945 or before. Poultry Research Station, Mukteswar brought out its *Annual Report* for sometime.

Veterinary Science

Institute of Veterinary Biological Products is the only Institute recorded. It was established at Poona in 1947 to manufacture veterinary biologicals needed for the state of Bombay to control epidemics in animals and poultry [Rajagopalan et al: 413].

Sericulture

The number of institutes recorded here is three. They are: Central Sericultural Research Station, Berhampore (1943); Sericultural Research Station, Kollegal

(1945); and Central Sericultural Research Substation, Kalimpong (1946). All the stations are conducting research on various aspects of sericulture. Central Sericultural Research Station, Berhampore is bringing out its *Report* periodically from its inception.

Fisheries

As per this study as many as four institutes on fisheries were established during 1939 -1947. The institutes in chronological order are: Fisheries Technological Station, Kozhikode (1945); Deep Sea Fishing Organisation, Bombay (1946); Central Marine Fisheries Research Institute, Mandapam Camp (Feb 1947); and Central Inland Fisheries Research Institute, Barrackpore (March 1947). The areas of activity of the stations covered inland fisheries, marine fisheries as well as fisheries technology. The periodicals brought out by the institutes include *Annual Report*, *Quarterly Report*, *Bulletins*, *Indian Journal of Fisheries*, etc [Rajagopalan et al, etc]

CHEMICAL ENGINEERING

Indian Institute of Chemical Engineers was founded in Calcutta in 18 May 1947 [E mail dated 8 June 2004]. It is bringing out its *Transactions* since its inception.

Fuel

The nucleus of the Central Fuel Research Institute was established in 1945 at the Indian School of Mines and Applied Geology, Dhanbad. The Institute was officially inaugurated in its present site at Jeolgara on 22 April 1950 by Dr Rajendra Prasad. [Rajagopalan et al :17]

Paper

The art of paper making entered India probably through Nepal by about the 11th century AD, Nepal in turn obtained the same art from China earlier. Since then paper making was continuing in India and gradually paper started replacing the traditional writing media like palm leaves and birch bark (*bhūrja patra*). By the later half of the 15th century, Kashmir started producing high quality paper and gradually paper production centres grew up in Punjab, Oudh, Bihar, Bengal, Gujarat, Aurangabad and Mysore. However, not many institutes on

paper came up in India during the British period. The only institute that has come to our notice is Hand Made Paper Institute which was established in 1940 [CHSI: 341-2].

Textile Technology

Technological Institute of Textiles was set up at Bhiwani in 1943 by the eminent industrialist G D Birla to impart technical training under actual mill working conditions. [Elhence et al: 1669]

Jute

Indian Jute Mills Association established its Research Institute in 1943 for carrying on research and development activities on jute. The Research Institute was wound up in 1960s when Indian Jute Industries Research Association (1966) took over the R & D activity. [Rajagopalan et al: 887]

Wool

Wool Analysis Laboratory was started at Poona in 1940 for the development of sheep and wool on a regional basis. The Laboratory publishes its *Annual Report* [Rajagopalan et al: 413-14]

Building Materials

Concrete and Soil Research Laboratory was established at Madras in 1945. The Laboratory published its *Annual Report*.

SOCIETIES, ASSOCIATIONS, ETC

The societies, associations, etc. which started and seems to have started during the period pertain to such subjects as follows: General, Museums, Psychology, Industry, Transport, Ethnography, Science, Natural History, Statistics, Palaeontology, Ecology, Genetics, Botany, Zoology, Entomology, Medicine, Physiology, Health and hygiene, Public health, Pharmacology and pharmacy, Ayurveda, Homoeopathy, Clinical medicine, Tuberculosis, Dentistry, Surgery, Obstetrics and gynaecology, Engineering, Mechanical and electrical engineering, Mining, Aeronautics, Agriculture, Pests and diseases, Forestry, Horticulture, Dairying, Sericulture, Printing, Chemical technology, Food technology, Oil technology, Metallurgy, Manufactures,

Paper technology, Textile technology, Plastics, Architecture, Photography, and Geography. They are being listed in the same order as the subjects have been listed above. The exact dates of foundation of the societies could not be ascertained in many cases, hence only approximate or probable dates have been provided.

General

Journal of the Gujerat Research Society, a multilingual journal, started publishing from 1939. Hence, it is assumed that Gujerat Research Society either started in 1939 or before.

Museums

Only one association, i.e. Museums Association of India (c1945) has been recorded. It brought out a journal called *Journal of Indian Museums*.

Psychology

In this case also, only one association has been recorded. The association entitled Indian Psychoanalytical Society (c1947) brought out the noted journal called *Samiksâ*.

Industry

In this case, four organizations, viz. All India Manufacturers' Organization (AIMO) (1941); Saurashtra Millowners' Association, Surendranagar (1942); Marhatta Chamber of Commerce and Industry (c1945); and M P Chamber of Commerce and Industry (c1947) have been recorded. At the first All India Manufacturers Conference organized in Bombay in March 1941, a Central Committee of industrialists was appointed to frame the constitution of a new organization. The Central Committee while framing the constitution named the new organization as the All India Manufacturers' Organization (AIMO). Dr. Sir M. Visvesvaraya, Bharat Ratna, was the Founder President of AIMO [Internet – 30 April 2004]. AIMO started bringing out its *Annual Report* from 1941, *Newsletter* from 1942⁷ and *A. I. M. O. Journal* from 1946. Saurashtra Millowners' Association did not produce any periodical till 1947. Marhatta Chamber of Commerce and Industry started the Marathi periodical called *Sampada* in 1945 and M P Chamber of Commerce and Industry started its *Patrika* in Hindi possibly in 1947.

Transport

Two societies recorded in this case are: Maritime Union of India (c1945), and Delhi Provincial Motor Transport Union Congress (c1947). Both brought out periodicals.

Ethnography

Ethnographic and Folk Culture Society founded in 1945 is devoted to conduct research on anthropological sciences. The Society exists to date and functions from Lucknow . It publishes *The Eastern Anthropologist*, *Manav* [Hindi], and *Indian Journal of Anthropology and Human Genetics* [WoL2002: 736].

SCIENCE

Maharashtra Association for the Cultivation of Science was founded in 1946 by some leading scientists and educationists at Poona. It is affiliated to the Poona University and recognized as a centre of postgraduate research [Rajagopalan et al: 518]. Science Club (c1947) was established in Calcutta for the popularization of science. It brought out its *Journal* from 1947.

Natural History

During this period also one society called Gujarat Natural History Society (c1942) emerged. It started the journal *Prakriti* in the year 1942.

Statistics

With the establishment of the Indian Statistical Institute in Calcutta in 1931, Calcutta became the hub of statistical research in the country. The establishment of Calcutta Statistical Association in 1945 was thus a natural outcome of the educational development in this sphere. The Association started bringing out its *Bulletin* from 1947.

Palaeontology

Prof Birbal Sahni, FRS, was deeply interested to initiate organized palaeobotanical research in India. He along with his wife were making all out efforts to establish an Institute of Palaeobotany in 1940s. In June 1946, they were able to establish the Palaeobotanical Society and in September 1946 the Institute of Palaeobotany at Lucknow.[Rajagopalan et al: 506].

Ecology

The *Report of the Indian Ecological Society* appeared for the first time in 1941. From this it appears that the Society was formed in 1941 or before.

Genetics

To stave off the recurrence of famine and to increase the food grain production as well as agricultural output of the country, the British paid great attention towards agricultural research in India from the beginning of the 20th century. As a result, a large number of agricultural experiment stations came up throughout the length and breadth of the country; Royal Commission of Agriculture was set up in 1926 to survey the agricultural situation in India and suggest remedial measures; Imperial Council of Agricultural Research was founded in 1929 in New Delhi to promote and coordinate agricultural research. All these developments made the environment conducive for the launching of a society like Indian Society of Genetics and Plant Breeding in 1941.

Zoology

Indian Association of Systematic Zoologists was founded in Calcutta in 1947. This seems to be the first organization on systematic zoology from India. It exists to date.

MEDICINE

Medical College, Amritsar was set up in 1943. In the same year came up the Students Union of the College called Medical College Students Union. It started publishing the multilingual journal called *Medicus* from 1943 itself.

Immunity

Proceedings of the Immunity Scientific Research Association started appearing from 1945. From this it appears that Immunity Scientific Research Association started in 1945 or before.

Health and Hygiene

Vyayamkala Patrika Nirvahana Samiti of Guntur started publishing *Vyayamkala* in Telugu from 1939. No other information could be gathered about the Society.

Public Health

All Bengal Public Health Association (c1939) was based in Calcutta. It brought out *Bengal Public Health Journal* from 1939 to 1946.

Pharmacology and Pharmacy

Four associations/societies have been recorded. Indian Pharmaceutical Association (c1939) was first based in Benares, and then moved to Bombay. The Association existing till date was responsible for the starting of the periodical *Indian Journal of Pharmacy*. Pharmaceutical Society of India (c1939) was based in Madras. It started the journal *Pharmacist* in 1939 that existed only for a year. Indian Drugs Research Association was founded in 1944. Pharmacists Association of India (c1945) was founded in Calcutta. It started the journal *Indian Pharmacist* in 1945/46. The journal continued till 1956.

Systems of Medicine

Ayurveda

Four societies have been recorded. They are: Tamil Nad Ayurveda Mahamandala, Tiruchy (c1939), Ayurvedotkarsh Trust, Bijapur (c1940), Rajasthan State Ayurved Congress = Rajasthan Pradesh Vaidya Sammelan (c1944), and Ayurved Seva Sangh, Nasik (c1947). All these organizations brought out journals on Ayurveda. Tamil Nad Ayurveda Mahamandala started the Tamil monthly called *Vaidiya Candrikai* in 1939. Ayurvedotkarsh Trust (c1940) of Bijapur started two monthly journals in 1940. Both were named as Dhanvantari: one was in Hindi and the other in Kannada. Rajasthan State Ayurved Congress (c1944) started its bilingual (Hindi and Sanskrit) journal titled Rajasthan State Ayurved Congress Magazine in 1944. Ayurved Seva Sangh, Nasik started its official organ *Âyurveda Patrikâ* as a monthly in Marathi in 1947.

Homoeopathy

Two associations on homoeopathy have been recorded - Bombay Homoeopathic Association (c1939) and Madras Presidency Homoeopathic Association (c1947). Both brought out journals. Bombay Homoeopathic Association brought out *Homoeopathic Outlook* from 1939 to 1965. Madras Presidency Homoeopathic Association started bringing out *Madras Homoeopathic Journal* from 1947.

Pathology & Clinical Medicine

Association of Physicians of India (c1945) started bringing out the *Proceedings* of its Annual Conferences from 1945.

Dentistry

Montemorency Dental Students' Union (c1941) was established in Lahore. It started *Punjab Dental Journal* in 1941. Records suggest that the journal did not survive beyond one year.

Tuberculosis

Tuberculosis Association of India (c1939) was established in Delhi. It started bringing out its *Proceedings* from 1939, and *Indian Journal of Tuberculosis* from 1953.

Obstetrics and Gynaecology

Obstetrics and Gynaecological Society of Northern India (c1940) was originally established at Lahore. After the partition, the Society moved to Ludhiana and functioned from there till 1958, after which it moved to Delhi. It started publishing *Journal of the Obstetrics and Gynaecological Society of Northern India* from 1940. In 1944, the name of the journal was changed to *Journal of the Obstetrics and Gynaecology*.

ENGINEERING

Engineering Association of India (c1945) was established in Calcutta. It started publishing *Indian Engineering Industries* from 1945 and continued publishing possibly till 1971.

Mechanical and Electrical Engineering

Two associations pertaining to the subject have been recorded. The Associations are: Regimental Association for the Corps of Electrical and Mechanical Engineers (c1945); and Indian Electrical and Mechanical Engineers Corp Association (c1946). It is likely that both the associations are the same, the second one resulted due to the change in the title of the first association. The periodicals came out of these associations are *EME Journal* and *Indian Electrical and Mechanical Engineers Journal*.

Mining

Two associations devoted to mining have been encountered during the course of the study. Indian Mine Managers' Association (c1943) was established at Dhanbad. It started publishing its *Report* from 1943/44 or before. The other Association is the Indian Mica Miners and Dealers Association (c1947). It was established at Hazaribagh and it started publishing its *Report* from 1947 or before.

AGRICULTURE AND RELATED DISCIPLINES

Two organizations have been recorded in this study. Both the organizations were based in Madras. All India Seed Growers, Merchants and Nurserymen Association (c1944) started publishing its *Bulletin* from around 1944; and Madras People's Food Council (c1947) issued its first *Pamphlet* in August 1947.

Agricultural Economics

Indian Society of Agricultural Economics was established in 1939 in Bombay. It started publishing the *Proceedings of the Conference* of the Society from 1940 and *Indian Journal of Agricultural Economics* from July 1946.

Pests and Diseases

Indian Phytopathological Society was established in 1947 in Delhi. It started publishing the journal *Indian Phytopathology* from the very next year, i.e. 1948.

Horticulture

Horticultural Society of India (c1943) and Bihar Horticultural Society (c1943) are the two societies recorded in this study. Both the Societies were established at Sabour, Bihar. However, Horticultural Society of India shifted to Delhi at a later date. This Society started bringing out *Indian Journal of Horticulture* from 1943. Bihar Horticultural Society started bringing out *Bagwan* in Hindi from 1946.

Dairying

Bangalore Dairy Cattle Society (c1942) is the only society recorded here. It seems the Society was superseded by Indian Dairy Science Association at a later date. The Society started the journal *Bulletin of the Bangalore Dairy Cattle Society* in 1942 which merged into *Indian Dairyman* in July 1949.

Printing

Poona Press Owners Association Ltd (c1940) started publishing *Mudran Prakash* in Marathi from 1940. Possibly *Mudran Prakāsh* is the first Marathi journal on printing.

CHEMICAL TECHNOLOGY**Food Technology**

Two associations have been recorded. They are: The All India Food Preservers Association, and Indian Confectionery Manufacturers' Association. The All India Food Preservers Association was established in Bombay in 1942 to promote, encourage, defend and support Indian food preservation industry; to raise the standard of quality of the manufactured food by sanitary and hygienic methods; etc. [IPY 1949: 545]. It started publishing *Indian Food packer* from 1946/47. Indian Confectionery Manufacturers' Association started publishing its *Report* from 1946/47. Maybe, the Association was formed in 1946 or before.

Oil Technology

Oil Technologists Association of India started publishing its *Proceedings of the Annual Convention* from 1945. From this it appears that the Association was formed in or before 1945.

Metallurgy.

Steel Rerolling Mills Association of India was also established in Calcutta in or before 1946. It started bringing out its *Report* possibly from 1947.

Paper

Indian Paper Mills Association was founded in 1939. There is no indication as to its bringing out any periodical till 1947.

Textiles

Two associations have been recorded, namely, Textile Association (India) and Ahmedabad Textile Industry's Research Association (ATIRA). Textile Association (India) was formed in 1939 and it started publishing its official organ *Textile Digest* from 1940. ATIRA was founded in 1947 after independence as a cooperative effort of seventy-one mills of Ahmedabad. Its aims among others were to improve the technology and productivity of its sponsoring industry; seek better textiles, lower cost, increased production and the well-being of those working in the textile industry; and to undertake basic and applied

research, consultation and technical services as well as training programmes. It brings out *Annual Report* and a few other periodic publications [Rajagopalan et al: 882-30].

Jute

Indian Jute Mills Association (1884) added the Department of Statistics in 1945 or before. The Department brought out *Monthly Summary of Jute and Gunny Statistics* for about ten years starting from 1945.

Plastics

All India Plastics Manufacturers Association was established in Bombay in 1945 [Internet]. It started publishing its *Report* from 1946.

ARTS

Architecture

Two organizations have been recorded. Architectural Society, and Modern Architectural Research Group. Architectural Society (c1945) was established in Delhi and it started publishing the periodical *Apex* from 1945 which possibly did not last long. Modern Architectural Research Group (c1946) was founded in Bombay and it started publishing *Marg* from October 1946.

Cinematography and Photography

Four organizations have been recorded and each one brought out periodicals. Indian Motion Picture Congress (c1939) started publishing its *Proceedings* from 1939. Indian Motion Picture Producers Association (c1940), Bombay published *Journal of the Film Industry* during 1940 to 1944. Mysore Photographic Society (c1945) brought out its *Report* for about ten years starting from around 1945. Federation of Indian Photography (c1945) started publishing *View Finder* from 1945 from Bangalore.

GEOGRAPHY

Three societies have been recorded. All brought out periodicals. Calcutta Geographical Society (c1939) brought out *Publications, Calcutta Geographical Society*. In all six issues were brought out during 1939 to 1944. Indian Geographical Society (c1945) started monograph series from 1945.

National Geographical Society of India (c1946) started publishing its *Bulletin* from September 1946.

COMPANIES ETC

The companies listed here in chronological order do not seem to have brought out periodicals of scientific value till 1947. Still they have been included here as all the companies went for R & D before or after 1947. The companies are listed with the date of foundation. Anil Starch Products Ltd (1939); East India Pharmaceutical Works Ltd, Calcutta (1939); New Standard Engineering Co Ltd (1939); Sirpur Paper Mills Ltd (1939); Tata Chemicals Ltd, Mithapur (1939); Automatic Electric Ltd (1943); Geoffrey Manners and Company Ltd (1943); Praga Tools Ltd (1943); Caprihans India Ltd (1946); Kirloskar Electric Company Ltd (1946); Machinery Manufacturers Corporation Ltd (1946); Travancore Titanium Products Ltd (1946); Atul Products Ltd (1947); Bombay Oil Industries Pvt Ltd (1947); Coats of India Ltd (1947); Home Industries Co (1947); Sandoz (India) Ltd (1947); and Unichem Laboratories Ltd (1947).

PERIODICALS

First periodicals on various subjects

The first periodical has appeared on a number of subjects which are listed here in chronological order. Apiculture (1939), handloom (1939), agricultural economics (1940), film industry (1940), mine safety (1940), palaeobotany (1940), biochemistry (1941), experimental medicine (1941), manufactures (1941), plant breeding (1941), aeronautics (1942), dry farming (1942), naturopathy (1942), cottage industry (1943), pests and diseases (1943), trade marks (1943), fertilizers (1944), hardware (1944), nursery (1944), cocconut (1945), immunity (1945), ionosphere (1945), marine transport (1945), oil technology (1945), waterways (1945), confectioneries (1946), food packaging (1946), hydroponics (1946), industrial art (1946), machine tool (1946), plastics (1946), soil engineering (1946), tanning (1946), technical education (1946), turmeric (1946), carbon (1947), chemical engineering (1947), compost (1947), defence science (1947), fuel (1947), ground water (1947), mica (1947), psychoanalysis (1947), radiology (1947), road transport (1947), rubber technology (1947), and standardisation (1947).

Growth

During the period of nine years (1939 – 1947) about 360 new periodicals [Journals – 184, Reports – 93, Data periodicals – 19, Proceedings – 14, and Others – 48] appeared on the scene setting the average at 40 periodicals per year. It may be noted that the growth rate was 38 during 1914 – 1938, and 33 during 1901 – 1913. It looks paradoxical that despite the two devastating Wars the growth rate of periodicals did not come down. No doubt, the number of the birth of new periodicals declined significantly during the Wars. But, immediately after the Wars, the growth rate picked up and over-compensated the decline in number. For example, in 1939 the number of new periodicals was 48, in 1940 and 1941 the number came down to 26 and 27, the number further went down to 22 in 1943 and 1944. From 1945 the number started rising with 43 new titles. In 1947 it peaked with 86 titles, a number which the world of Indian S & T periodicals never saw before.

CONCLUSION

I am indeed thankful to INSA for financial support for two-year period which is somewhat small by any standard for such a gigantic study. In a country like India where the bibliographic control of periodicals is scant, the documents carrying some information about periodicals is difficult to trace, and in many cases extremely difficult to access; systematic preservation of documents is yet a distant dream, one can easily imagine the hard labour one has to put to glean the basic information. Still every attempt has been made to compile a comprehensive list of S & T periodicals produced from India in English, and Bengali. I feel the list of Portuguese periodicals is also quite comprehensive. I do not know how comprehensive is the coverage of other Indian language periodicals. The limitation of the study is the incompleteness of bibliographical details of periodicals in many cases. Also I could not ascertain the exact dates of foundation of many departments, institutions, societies and various other organizations where I have given only the approximate date. My research work of course is being continued without any support from anywhere. I strongly hope that I shall be able to remove many of the shortfalls of this study in future.

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WoL: *World of Learning*.