INDIAN STANDARDS INSTITUTION (ISI)

TENTH ANNUAL REPORT

APRIL 1956—MARCH 1957

19 UNIVERSITY ROAD
DELHI 8

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Free to Members

INDIAN STANDARDS INSTITUTION

(As on 31 March 1957)

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Vice-Chairman, AFDC & SWCAF	Dr. V. N. Patwardhan, Director, Nutrition Resarch Laboratories, Coonoor
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	Dr. B. R. Nijhawan, Director, National Metallurgical Laboratory, Jamshedpur
Chairman, *Electrotechnical Division Council (ETDC)* and *Standing Working Committee Electrotechnical (SWCET)*	Shri M. Hayath, Member (Hydro-Electric), Central Water & Power Commission (Power Wing), Shahjehan Road, New Delhi
Vice-Chairman, ETDC & SWCET	Shri B. V. Baliga, Chief Engineer, All India Radio, New Delhi

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THIS REPORT WILL BE PRESENTED BY THE EXECUTIVE COMMITTEE TO THE GENERAL COUNCIL OF THE ISI AT ITS NEXT ANNUAL MEETING

Headquarters

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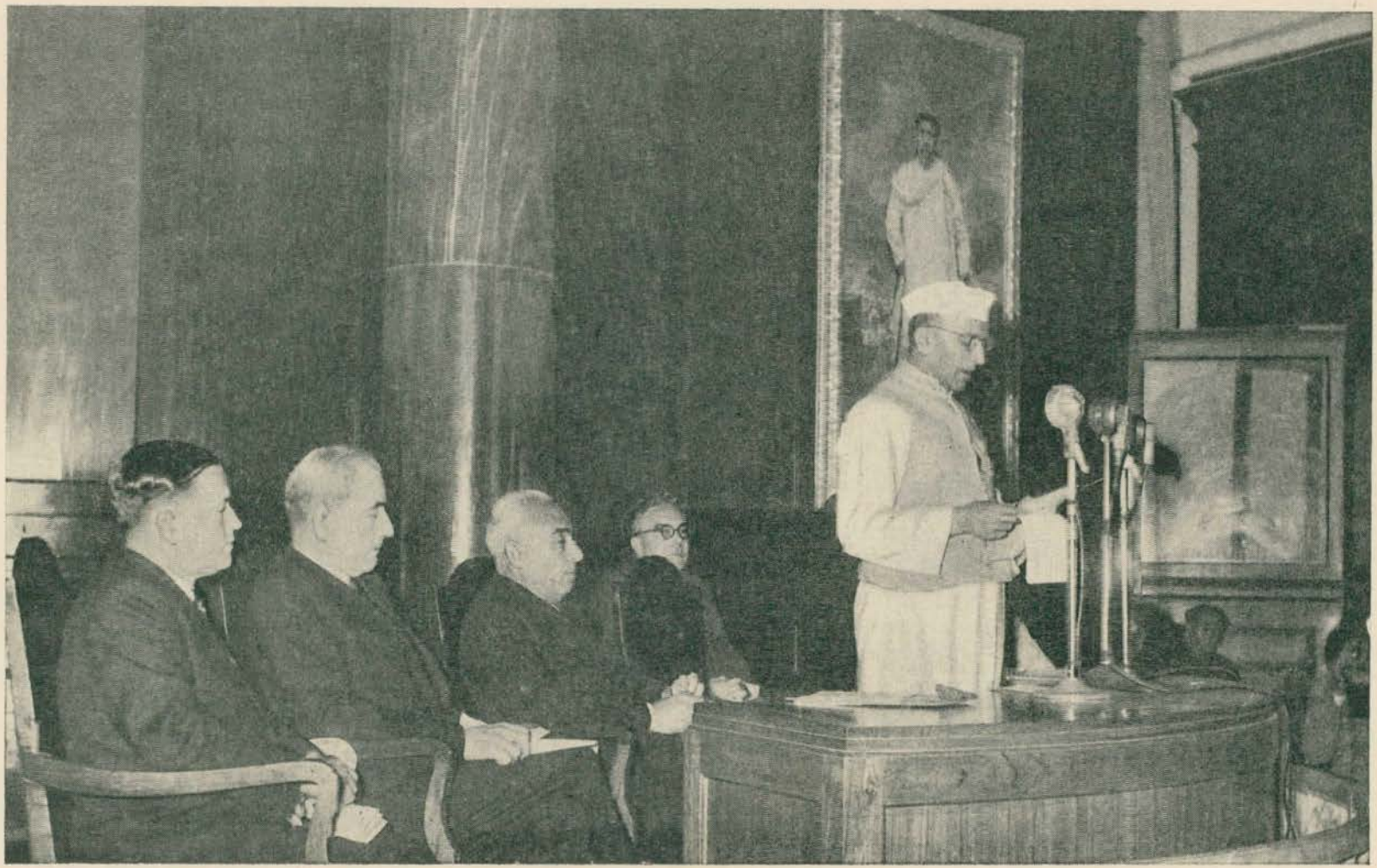

SHRI MORARJI DESAI, MINISTER FOR COMMERCE & INDUSTRY, GOVERNMENT OF INDIA, AND PRESIDENT ISI, DELIVERING THE INAUGURAL ADDRESS AT THE COMMONWEALTH STANDARDS CONFERENCE HELD IN NEW DELHI FROM 21 JANUARY TO 3 FEBRUARY. SEATED (FROM L TO R ON THE DAIS) ARE MR. A. L STEWART, DIRECTOR SAA; MR. J. S. CAMERON, PRESIDENT CSA; MIAN ZIAUDDIN, HIGH COMMISSIONER FOR PAKISTAN; MR. H. A. R. BINNEY, DIRECTOR BSI; AND DR. LAL C. VERMAN, DIRECTOR ISI (BEHIND THE PRESIDENT)

INDIAN STANDARDS INSTITUTION

GENERAL INFORMATION

Aims and Objects

The Indian Standards Institution was set up in 1947, in pursuance of a decision of the Government of India, for the purpose of preparing and promoting standards for Indian Industry. This decision followed upon the recommendations of the Industrial Research Planning Committee (1945), and was welcomed by the industry as the fulfilment of a demand, first put forward by the Twelfth Industries Conference held in Lucknow in 1940. The objects of the ISI include the preparation, promotion and general adoption, at the national and international levels, of standards relating to materials, commodities, structures, practices and operations. The ISI aims at assisting in the rationalization of industry by coordinating the efforts of producers and consumers for the improvement of appliances, processes, raw materials and products. It promotes quality control methods, and provides for the registration of Standard Marks applicable to materials, commodities, etc, conforming to standards issued by it.

Organization and Work

The overall control of the Institution rests with the General Council (GC), on which are represented industry, Central and State Governments, scientific organizations, subscribing members and the Division Councils of the ISI. The Executive Committee (EC), appointed by the GC, is responsible for the actual management of the affairs of the Institution. Financial matters are under the purview of a Finance Committee (FC), similarly appointed. The income of the Institution is derived from Government grants from the Centre, subscriptions from members, including State Governments, and sale of standards.

In the preparation of standards, the ISI functions through a large number of Sectional Committees, Subcommittees and Panels, consisting of scientists, technologists and representatives drawn from industrial and Government organizations. These committees are appointed by the EC or the seven Division Councils of the ISI, namely the Engineering Division Council (EDC), the Building Division Council (BDC), the Textile Division Council (TDC), the Chemical Division Council (CDC), the Agricultural and Food Products Division Council (AFDC), the Structural and Metals Division Council (SMDC) and the Electrotechnical Division Council (ETDC).

Proposals for formulating Indian Standards are normally entertained from the members of the ISI. Every proposal is scrutinized, first by the appropriate Division Council, and then by the Executive Committee. If the proposal is approved, the Division Council assigns the work to the Sectional Committee concerned with the subject, if one exists, or sets up a new committee.

A Sectional Committee is representative of the various interests concerned, but has to be weighted in favour of the consumers' interests. The sectional committees form subcommittees and panels, when required, and instruct them to prepare a working document or a draft on the subject after study of data and literature available on the subject. Where necessary, tests are carried out in collaborating laboratories. After the draft is approved by the Sectional Committee, it is issued in circulation, for the purpose of eliciting comments, to interested parties in India and abroad. This draft is reconsidered in the light of comments received, and when finalized, becomes a recommendation of the Sectional Committee. It is, then, submitted for approval of the Chairman of the Division Council concerned and to the Chairman of EC to whom power has been delegated to authorize its publication as an Indian Standard.

A period of one to three years may, therefore, elapse from the date that an item is proposed for standardization to the time when the standard is finally printed.

The bulk of the technical work towards the preparation of standards is done by the ISI committees. The staff in the ISI Directorate coordinates the work of these committees, undertakes the necessary secretarial duties, collects and supplies background data, organizes investigations and enquiries, ensures that delays are avoided and standards are appropriately examined at each stage of formulation. Finally, the standards are edited and published by the Directorate. The published standards are brought to the notice of the various indenting and purchase departments of the different Governments, Central and States, to ensure their early adoption.

Implementation and Certification

The ISI believes that the acceptance of Indian Standards by Industry or Government can best be promoted through the intrinsic merit of the standards themselves. The fact that Indian Standards are formulated in collaboration with the largest number of interests concerned should, it is believed, ensure their widespread acceptance. An important step taken by the ISI to aid industrialists to produce quality goods and for the consumers to recognize them, is the establishment of the ISI Certification Marks Division which issues licences to manufacturers to stamp their goods with a Standard Mark certifying that the goods conform to the relevant Indian Standard. The presence of this mark on any article is a guarantee to the consumer, in regard to the quality of the article he is purchasing. The extensive use of the facilities which ISI provides through this scheme should benefit the industrialists and the consumers in the country, and also strengthen and promote India's export trade.

Indian Standards are voluntary, and the membership of the Institution involves no compulsion on the part of members to follow them either in manufacture or in making purchases. All the same, a very large number of Indian Standards have already been adopted by Government departments for the purpose of making their own purchases. In addition, representatives of various departments of the Central Government have agreed, as decided at an inter-departmental meeting called by the Ministry of Commerce & Industry in September 1953, to place all orders on the basis of specifications contained in the Indian Standards wherever such standards exist. As a result of this policy decision and the Government directive that each department should let the Institution know within a reasonable time why a particular standard may not be acceptable, is going a long way in diverting Indian production to standardized channels. It is but natural that when any industry begins to produce items in response to official tenders, in accordance with standard specifications, the benefits of the improved quality become available to all consumers of such products.

International Sphere

The ISI also works at international level and collaborates closely with the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), two important bodies engaged in international standardization. In addition, close liaison has been established with National Standards Bodies of the Commonwealth. The ISI is also active at the executive levels of the ISO and the IEC. It is an elected member of the governing Council of the former and the Committee of Action of the latter. Dr. Lal C. Verman, Director, ISI, was the elected Vice-President of ISO from 1949 to 1955.

Membership

Membership of the ISI is open to all organizations and persons interested in the objects of the ISI. There are three categories of membership, namely (i) Sustaining Members and Sustaining Members (Associates), (ii) Ordinary Members, and (iii) Committee Members. Sustaining membership is generally open to all organizations, companies, firms, Government departments and neighbouring countries; but the Associate membership is limited to firms with an annual business of less than Rs 250 000 and professional, scientific, technological and educational institutions. Individuals interested in the work of the ISI can join as Ordinary Members. Persons serving on the ISI Councils and Committees are classed as Committee Members. Depending upon the class of membership, members have the right to apply for information on standardization both in India and abroad, to give evidence at appropriate technical levels and continuously to receive information concerning the development of standards on subjects in which they are interested.

Publications

Besides the Indian Standards issued from time to time, the ISI issues an ISI Handbook of publications giving general information about organizational set-up of the ISI and a comprehensive list of Indian Standards with a brief description of each. The ISI also issues free to its members in all categories a useful and informative Bulletin every two months; its annual subscription for non-members is six rupees. The Bulletin contains articles, research papers and other information relating to standardization activities in India and abroad.

ACKNOWLEDGEMENT

The ISI records with pleasure, gratitude and pride its deep appreciation of the financial support and specialized technical assistance, received during the year, from an increasing circle of its members and other individuals and organizations interested in it. The ISI believes that this pattern of growing co-operative activity is an index of an all-round realization that through standardization lies the road to industrial and trade efficiency, and that, with the support it receives, the ISI is making its vital contribution towards economic advancement of the country. Encouraged by the faith reposed in, and conscious of the expectations from it, the ISI looks forward with confidence to the future of its working in progressive partnership with interests representing trade, industry, science, technology and government.

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1. GENERAL REVIEW

1.1 The year 1956-57 saw the completion of the first ten years of the existence of the ISI. On 6 January 1957 fell the tenth anniversary of the adoption of the Memorandum of Association of the Institution. In this decade of its existence, the ISI has been able to establish itself firmly and usefully in the national as well as international fields.

This year the ISI made special contribution towards solution of the problems created by the acceptance by the Government of India of the proposal originally put forth to the ISI for official adoption of Metric System of weights and measures in the country. During the period under review a step forward was taken in tackling the question of conversion of values by issuing three Indian Standards, namely IS: 786-1956 Conversion Factors and Conversion Tables, IS : 787-1956 Guide for Interconversion of Values from One System of Units to Another, and IS: 1020-1957 Conversion Tables for Ordinary Use. Two of these Indian Standards contain tables giving conversion of foot-pound units into corresponding metric values, and IS: 787 attacks the problems of conversion from the theoretical and practical view point. Fundamental aspects involved in practical conversion operations had not always been fully appreciated until this study was undertaken. At the last Commonwealth Standards Conference as well as in certain ISO Committee deliberations, India's approach to the problem of conversion has gained a measure of recognition. Allied with this problem is the issue of creating new standards of sizes, of products in terms of metric units, and India presented a document to Commonwealth Standards Conference advocating a policy of maximum possible alignment with inch-based standards so as to cause the minimum possible dislocation in existing practices of industry and trade. It is confidently hoped that India's rational approach will result in better understanding of the problem in both Commonwealth and ISO fields leading to the ultimate development of unitary international standards, which are necessary to ensure interchangeability between products made in different countries.

The year has also seen the commencement of the Second Five-Year Plan period for the ISI. Among the projected developments were the establishment of two new Division Councils (*see* **1.2** *and* **1.3**) which were decided to be created in the previous year. The work of implementation of Indian Standards and the Certification Marks Scheme also made good progress thus enabling at least some of the consumers to buy goods of known and assured quality.

1.2 Inauguration of Structural and Metals Division Council (SMDC) — The Structural and Metals Division Council (SMDC) was inaugurated by Shri Manubhai Shah, Union Minister for Heavy Industries, at a function held in the auditorium of the Indian Chamber of Commerce, Calcutta, on 26 October 1956.

The considerable amount of work undertaken through the Steel Economy Programme highlighted the possibilities, advantages and the need for standardization of metals and metal products for co-ordinating the metallurgical aspect with the use aspect. This co-ordination is necessary in the case of practically all standards relating to metals, but as regards structural application of metals the need for such co-ordination is particularly great. The SMDC has been set up to achieve this co-ordination. The rapid industrialization in India, programmed through the Second and subsequent Five-Year Plans will greatly depend on the expansion of metal producing and consuming industries. A parallel development in standardization on a co-ordinated basis and at an accelerated pace is expected to be achieved by the setting up of the separate Division for metals and structural engineering.

The new Division would be responsible for the national and international standardization work relating to ferrous and non-ferrous metals, foundry, refractories, metalliferrous minerals, metal structurals, metal structural engineering and welding. All these subjects except the last three had been dealt with previously by the Engineering Division of the ISI. The last three items had been dealt with by the Building Division.

1.3 Inauguration of Electrotechnical Division Council (ETDC) — The inauguration of the Electrotechnical Division Council (ETDC) by Shri Morarji Desai, Minister for Commerce & Industry, and President ISI, on 28 March 1957 was another mile-stone in the development of the ISI. It was a recognition of the rapid strides which the infant Electrical Industry had made in the last decade. The long strides made in the development of multi-purpose projects and the electricity supply industry was reflected in the demand for equipment for the generation, transmission and utilization of energy. The Government of India gave all the encouragement that it could to manufacturers of electrical materials, but at the same time the need for regulating quality was emphasized. The Indian Standards Institution consequently gave due attention to the standardization of electrical materials. Standards for electrical conductors, insulated wires and cables, transformers, electric motors, fans, lamps, primary and secondary cells and batteries of different types,

radio receivers and components, have already been laid down. Standards enable the buyer and the seller to speak the same language. By simplifying and unifying requirements, standards enable bulk production which naturally helps in economizing in cost.

If the use of electricity in the homes is to become popular, safety in electrical appliances and other items of domestic use should be given special attention. In many countries, notably the Scandinavian countries, Canada and Australia, it was practically impossible for anyone to manufacture and offer for sale appliances which have not been certified as inherently safe. It is hoped that at not too distant a date India too will have enforceable regulations which would safeguard the user against accidents.

The standards published by the Institution have taken this into account, and it is hoped that Indian Standards will serve as useful instruments for regulation of the electrical industry ensuring safety to users.

The Institution is grateful to the different professional and scientific organizations, associations of manufacturers, research and testing organizations and all others who had helped in the work on electrical standards and particularly to Shri S. A. Gadkary who, with his foresight and long experience of development of the electricity supply industry in India, had guided the work of the Institution for the last five years as President of the Indian National Committee of the International Electrotechnical Commission working under the authority of the Engineering Division Council.

1.4 ISI Branch Offices — The Bombay industrialists and others interested in standardization reacted favourably to the establishment of the ISI Branch Office at Bombay. The Office proved useful in establishing liaison between the ISI and the general public and industrialists of Bombay. Encouraged by this response, the Institution decided to open another Branch Office at Calcutta. The Calcutta Office started functioning from 16 September 1956 but formal opening ceremony was performed by Shri Manubhai Shah, Minister for Heavy Industries, Government of India, on 26 October.

Like its counterpart in Bombay, the Calcutta Branch Office acts as a centre for dissemination of information in regard to the work of standardization. It assists and serves the eastern region by giving information regarding the work of the Institution, advising implementation of Indian Standards, conducting technical enquiries and preliminary inspection in connection with ISI Certification Marks Scheme, contacting parties for membership, holding stock of Indian and foreign standards for sale, etc.

An Advisory Committee representing all organizations interested in standardization has been set up under the chairmanship of Shri L. P. Misra, a prominent industrialist of Calcutta, to advise the Branch Office to perform its functions most efficiently. At present, there are 20 members of the Advisory Committee including the chairman.

The Advisory Committee of the Bombay Branch Office is also rendering useful service under the chairmanship of Shri E. A. Nadirshah of the Concrete Association of India, Bombay. In order to help the Advisory Committees in their work, both the Branch Office Advisory Committees have set up their Executive Committees—in Bombay under the chairmanship of Shri Prabhu V. Mehta, and in Calcutta under that of Shri L. P. Misra.

To meet the requirements of industries in the southern zone of India, the Executive Committee of the Institution decided in its meeting held on 12 November 1956 to open a third Branch Office in Madras in the beginning of the financial year 1957-58.

1.5 Commonwealth Standards Conference, 1957 — The ISI had the privilege of acting as host to the Third Commonwealth Standards Conference which was held in New Delhi from 21 January to 3 February 1957. The Conference was inaugurated by Shri Morarji Desai, President of the ISI, at Parliament House, in the presence of some 700 distinguished guests including delegates and observers. The various sessions of the Conference were held at the National Institute of Sciences and the Institution of Engineers (India), New Delhi.

The overseas delegates to the Conference, who were about 50 in number, included representatives from national standards organizations of Australia, Canada, New Zealand, Pakistan and United Kingdom. The Economic Commission for Asia and the Far East (ECAFE) which has interest in standardization activities of the region, was represented through an observer, and there was also an observer from South Africa. The Indian delegates to the Conference, numbering about 80, were from various Government departments, industry, trade associations, scientists and technologists representing the consumer and producer interests in the subjects for discussion at the technical sessions of the Conference.

The Third Conference differed from those held earlier in 1946 and 1951 in that it combined a General Session on policy and administration with a series of technical sessions on the alignment of Commonwealth standards in particular fields. That brought in technical experts to the Conference, which made it possible to have expert views in the General Session from several countries on the important technical aspects of standards on subjects under discussion. Some of the discussions in the technical sessions, particularly those on the inch and metric dimensions in certain standards, provided useful examples for the more general discussion as to how Commonwealth agreement might be facilitated.

1.5.1 *General Session* — The General Session which held its deliberations from 21 to 31 January was held under the chairmanship of Dr. Lal C. Verman with Mr. H. A. R. Binney, Director BSI, acting as co-chairman. The agenda for the General Session included both a review of the recommendations of the 1951 Conference and a number of new subjects, the most important of which in relation to intra-Commonwealth trade was the adoption by India of the Metric System. The discussion on the methods of reconciliation of standards in the two systems by direct Commonwealth consultations and in the wider forum of the International Organization for Standardization (ISO) helped considerably towards a better understanding of the problems both for India and for the other Commonwealth countries. In this and other fields, the exchange of information and

views proved valuable irrespective of the formal conclusions reached.

1.5.2 *Technical Session* — The subjects discussed at the technical sessions during the period of the Conference were as follows:

a) Electrical Equipment of Machine Tools
b) Cables
c) Safety Requirements for Domestic Electrical Appliances
d) Steel

Brief account of the work done at the sessions is given below.

The Technical Session on Electrical Equipment of Machine Tools was held from 22 to 24 January 1957 under the chairmanship of Sir Stanley Rawson (UK). The British Standard Specification for Electrical Equipment of Machine Tools (B.S. 2771: 1956) was taken as a basis for discussion and a number of amendments were proposed to meet the views of the delegations present. The UK undertook the task of preparing a new draft including the amendments suggested at the meeting with the object that technical recommendations of the Session would be incorporated in the various national standards in appropriate form in the interest of Commonwealth co-ordination.

The session on Cables was held from 22 to 25 January, the first two days under the chairmanship of Shri V. Venugopalan (India) and the next two days under the chairmanship of Mr. G. N. Green (UK). At this session, a review was made of the steps taken in the Commonwealth countries to implement the recommendations made at the Commonwealth Conference on Cables held in London in 1953. The other problems discussed were on (i) manufacturer's identification threads for cables, (ii) metric sizes of cables, and (iii) effect of tropical conditions on cables. The Session came to the conclusion that continuation of the work of the 1953 Conference had served the valuable purpose of bringing closer together the standards on cables in Commonwealth countries and this collaboration should be continued.

The session on Safety Requirements for Domestic Electrical Appliances was held from 28 to 31 January under the chairmanship of Mr. W. I. Stewart (Australia) with Mr. O. W. Humphreys (UK) as co-chairman. At this session, a basic memorandum from UK on safety requirements for electrical equipment, together with comments from Australia, Canada, India, New Zealand, South Africa and United Kingdom, was discussed. It was agreed that a revised memorandum should be prepared on the basis of the discussions to be taken into account by Commonwealth countries in preparing or revising safety specifications for electrical appliances.

The technical session on Steel, held from 28 to 31 January 1957 under the chairmanship of Shri J. J. Ghandy (India) with Mr. E. W. Senior (UK) as co-chairman, discussed a number of problems relating to standardization in steel. The Conference laid down procedure for achieving continuous and effective co-ordination in this field of standardization in the Commonwealth countries. The other Commonwealth countries took note of and expressed their appreciation for the basic work undertaken by India on Re-design of Hot Rolled Steel Structural Sections.

1.5.3 *Social Events and Visits* — The programme of the Conference included a series of receptions in the evenings and visits to historical monuments in Delhi and Agra and to the development projects at Chandigarh and Bhakra-Nangal.

On the opening day the delegates were received by the President of the ISI at the Rashtrapati Bhavan. They watched the Republic Day Parade on 26 January and were received by the President of India the same evening.

A detailed Report of the General Sessions and the Technical Sessions has been published and a review of the entire Conference together with extracts of the Report has appeared in the ISI Bulletin*.

1.6 Weights and Measures — In furtherance of the decision taken by the Government of India to adopt the Metric System as the only system of weights and measures in India within a period of ten years, brisk activity is going on for a phased introduction of the new system in all walks of Indian life. The decimal coinage has already been introduced from 1 April 1957 as a precursor to the major reform. The Standards of Weights and Measures Act, 1956, was passed in December 1956 by the Union Parliament and the Metric System will begin to be introduced in selected sectors of industry and trade with effect from the first of April 1958.

Having been responsible for the original proposal for adoption of metric system in India, the Institution continues to be called upon to advise on several matters connected with the implementation of the reform measures. The ISI is represented on the Government of India Standing Metric Committee (SMC), its subcommittees and *ad hoc* conferences held under its auspices. The SMC, having completed the work of enactment of the Central legislation, is now engaged in the task of preparing a co-ordinated plan of change-over for the Central and State Government departments, public and private sectors of industry and the internal and external trade of the country. The plan for the introduction of Metric System in Indian Standards has been worked out by the Directorate. The target of the plan has been so set that within ten years of legislative action, all Indian Standards pertaining to almost all industries will have been converted to Metric System of Weights and Measures. It is also up to the Institution to furnish all the basic standards required for the various phases of changeover in every branch of industry and trade. In this connection the Indian Standard Conversion Factors and Conversion Tables (IS : 786-1956) and the Indian Standard Guide for Inter-Conversion of Values from One System of Units to Another (IS : 787-1957) have already been published. The work of preparing Indian Standards for Commercial Weights and Measures was given highest priority. Work has been initiated on the more detailed and comprehensive task of preparing new standards and codes of practice, including certain design codes and handbooks on the basis of the new system of weights and measures. Some of the dimensional standards being prepared in this connection cover hot-rolled steel sections, metal products, screw threads, paper sizes and units for building measurements, building module and building components.

*See ISI Bulletin Vol. 9, No. 2, pp. 55-70 (1957).

1.7 Certification Marks and Implementation— The Certification Marks Scheme of the ISI received further recognition during its second year of operation by the receipt of a large number of applications for certification marking. Detailed study and investigations of these applications brought out clearly that not many licences could be granted as the products in many cases did not come up to the relevant Indian Standards. It also highlighted the fact that many production units had never had any occasion to test their products in all respects against the relevant Indian Standards. The factories were advised to improve upon their process of manufacture and the quality of their products in order to conform to Indian Standards. In many cases, quality suffered due to some fault in the raw material and the ISI had to take up the question with the suppliers of raw materials and was thus able to assist in the manufacture of better quality goods.

The Government of India found it necessary to impose a ban on the export of aluminium utensils which did not bear the Standard Mark of this Institution. This was done to ensure the quality of aluminium utensils exported to foreign countries as the Tariff Commission had brought to the notice of the Government that the quality of aluminium utensils exported from India was not always satisfactory.

The investigations by the Certification Marks Section for the purpose of granting licences helped to a considerable degree certain manufacturers to improve their processing techniques and available facilities for testing of materials. It is hoped that with more experience gained by the manufacturers it will be possible for the ISI to grant more licences for the use of its Certification Marks.

Though the different purchasing departments of the Government of India have adopted about 90 percent of Indian Standards published by ISI, the information available with the Institution about the manufacturers whose products are in accordance with Indian Standards has been very meagre in spite of all the attempts made so far. A fresh appeal was issued during the year to all members of this Institution to supply the information. The response has not been very encouraging as only 184 firms have intimated to ISI that they are producing goods in accordance with 387 Indian Standards. The efforts are being continued.

In spite of the adoption of Indian Standards by the different purchasing departments, it has been found that there is usually a lag between the adoption of an Indian Standard and its actual use in the tender enquiries. A constant watch has been kept by the ISI for the tender notices published in the Indian Trade Journal and elsewhere, and whenever it is found that reference to Indian Standards is not made in a tender notice, the fact is brought to the attention of the authority issuing the tender notice with the request to make the necessary reference in their tender enquiry. This method has been found to work satisfactorily, and it helps the authorities issuing the tender notices.

Now that the ISI has issued 919 Indian Standards including those under print on 31-3-57 with a large number under preparation and as the Certification Marks Scheme has been in operation for sometime, it has been proposed to call a conference of the representatives of the various Ministries of the Government of India, State Governments, Production Units in the Public Sector, Multi-purpose River Valley Projects and Commodity Boards to consider, among other things, the implementation of Indian Standard Specifications and recognition of the Certification Mark of the Institution. It is expected that this Conference would be held some time in July-August 1957.

1.8 ISI Building — The construction of the Building which was initiated in February 1956 and was expected to take only 12 months has not made that progress as was originally estimated. Only the structural portion of the ISI Building to the fourth floor has been completed during the year under review and the construction of the top floor and internal work was just started.

The Building Planning Committee (BPC) met four times during the year and finalized the award of contracts for services, namely sanitary and water supply installation, electrical installations, installation of lifts and air-conditioning of the Building. On studying the entire question and keeping the economic aspect in view, the BPC took the decision of completing the entire building project in one stage instead of doing it in two phases as originally decided. This would lead to economy and better utilization of the available land.

The BPC also felt that even with the maximum utilization of the available land and the construction of the Building in one phase, the total floor area thus made available would not be sufficient for the expanding needs of the ISI. It, therefore, felt that attempts should be made to acquire further land, preferably in the vicinity of the present Building, for future expansion.

In spite of the delay that has occurred in the construction of the Building, it is hoped that it would be completed in 1957 and the ISI would be able to shift into its new premises during the year.

Details regarding the fund raised for constructing the Building appear elsewhere in this Report (*see* pp. 49).

1.9 Advertisements in ISI Bulletin — The decision to accept advertisements in the ISI Bulletin has been extremely helpful in creating another source of income. During the year under report, about 400 advertisements for goods and services appeared in the ISI Bulletin. The six issues published during the year under review contained 220 pages of advertisements. The revenue from advertisements has off-set a part of the increasing cost of producing the Bulletin.

1.10 Research and Testing — Standardization of the products of modern industry is dynamic and requires continuous revision in the light of scientific advance. In the formulation of new standards and particularly in the revision of the existing ones much scientific knowledge and research and testing often become necessary, specially in regard to quality requirements specified in the standards and the methods of tests. This has necessitated close collaboration on the part of ISI with research institutions and testing organizations, both in the public and the private sectors, on an extensive scale. The ISI has from time to time conducted surveys of the testing facilities available and made use of such facilities whenever necessary with the assistance and the co-operation of the authorities

concerned. The need for maximum collaboration and co-operation between the ISI and the research and testing organizations in the country was also emphasized by the Panel of Scientists who met in Delhi in the latter part of 1956.

The ISI gratefully acknowledges the support and collaboration extended by the laboratories and institutions spread all over the country and covering diverse fields of technology, who have undertaken on behalf of the ISI investigations covering the work of various Divisions.

The Engineering Division initiated investigations on metric weights and measures, pencils, stainless steel table knives, dessert knives and fruit knives, abrasives and hurricane lanterns, and the following laboratories and institutions collaborated and gave active support in the investigations:

Andhra Scientific Co. Ltd., Masulipatam
Government Test House, Calcutta
National Physical Laboratory of India, New Delhi
Oriental Metal Pressing Works Ltd., Bombay
Technical Corporation (Private) Ltd., New Delhi
Technical Development Establishment, Stores, Kanpur

In the Chemical Division, work was initiated on mixed screen indicator to determine neutralization points of the first and second hydrogen ions of phosphoric acid; methods of test for coal and coke; pyridine base and caoutchoucine in denatured spirit; benzene and toluene; sodium thiosulphate; white oil; rubber-lined flax hose for fire-fighting purposes; barytes; natural red oxide of iron; whiting for rubber industry; seedlac, shellac and lac; gum spirit of turpentine; paper and allied products; phenolic moulding powders; and bleaching earths.

The Division has been fortunate in having extensive collaboration and support in the conducting of research and investigations under the auspices of the following institutions and laboratories:

American Standards Association (through their appropriate committee)
Association Francaise de Normalization (for 2 laboratories in France)
Atul Products Ltd., Atul
Bata Shoe Co. (Private) Ltd., Batanagar
Bombay-Sewree Chemicals Manufacturing Co., (Private) Ltd., Bombay
British Standards Institution (for 5 laboratories in the UK)
Central Fuel Research Institute, Jealgora
Chemical Examiner to the Governments of Uttar Pradesh and Madhya Pradesh, Agra
Chemical Testing and Analytical Laboratory, Government of Madras, Madras
Department of Chemical Technology, University of Bombay, Bombay
Forest Research Institute, Dehra Dun
Government Test House, Calcutta
Hindustan Lever Ltd., Bombay
IEC/TC 15 — Insulating Materials
Indian Institute of Science, Bangalore
Indian Lac Research Institute, Ranchi
Indian Turpentine and Rosin Co. Ltd., Bareilly
Industrial Testing & Analytical Laboratories, Calcutta
ITALAB Private Ltd., Bombay
Mining Research Station, Dhanbad
National Chemical Laboratory, Poona
National Physical Laboratory, New Delhi
Regional Research Laboratory, Hyderabad
Shri Ram Institute for Industrial Research, Delhi
Tata Oil Mills Co. Ltd., Bombay
Technical Development Establishment, Military Explosives, Kirkee
Technical Development Establishment, Textiles and Clothing, Kanpur

In the building industry, the standardization work has required investigation and research work on cement and concrete, ceiling and ridge tiles, surkhi, lime and lime stones, building stones, gypsum building boards, sluice valves, glazed wall tiles, pozzolanas, bituminous roofing felts, cement concrete flooring tiles, plywood, magnesium oxychloride floors, bricks, timber and timber products, timber preservatives, packing cases, sieve shaker, current meters, research on noise levels and noise comfort conditions, and gypsum plaster boards.

In this work the following institutions and laboratories collaborated actively:

Andhra Scientific Co. Ltd., Masulipatam
Annapurna Metal Works Ltd., Calcutta
Associated Cement Companies Ltd., Bombay
Central Building Research Institute, Roorkee
Central Glass and Ceramic Research Institute, Calcutta
Central Public Works Department
Central Road Research Institute, New Delhi
Concrete Association of India, Bombay
Concrete Research Laboratory, Madras
Forest Research Institute, Dehra Dun
Geological Survey of India
Glenfield and Kennedy Ltd., Bombay
Government Test House, Calcutta
Hyderabad Engineering Research Laboratory, Hyderabad
Indian Institute of Science, Bangalore
Kirloskar Bros., Kirloskarvadi
Mysore Engineering Research Station, Mysore
National Buildings Organization, New Delhi
National Physical Laboratory, New Delhi
Oxychloride Flooring Manufacturers' Laboratories
Technical Development Establishment Laboratories, Kanpur

The Textile Division has initiated work on filter cloth; colour fastness of textile materials; handloom cotton bed durrees; tamarind kernel powder; jute bags; cotton yarn for handloom cloth; and twin wire healds, commercially rust-proof.

The laboratories and institutions which have collaborated in this work are:

Ahmedabad Textile Industries Research Association, Ahmedabad
Department of Chemical Technology, Bombay
Forest Research Institute, Dehra Dun
Government Test House, Calcutta
Indian Jute Mills Association Research Institute, Calcutta
National Sugar Institute, Kanpur
Technical Development Establishment Laboratories (Textile and Clothing), Kanpur
Technological Laboratory, Indian Central Cotton Committee, Bombay

In the field of work of the Structural and Metals Division Council, investigations on structural steel sections, chrome molybdenum steel bars, foundry facing material, indigenous moulding materials, clay, etc, were conducted in collaboration with the following laboratories and institutions:

Civil Aviation Department, Government of India, New Delhi
College of Engineering, Anantpur
Indian Institute of Science, Bangalore
Indian Institute of Technology, Kharagpur
National Metallurgical Laboratory, Jamshedpur
National Physical Laboratory, New Delhi
University of Roorkee, Roorkee

The electrical industry has need for standards based on the latest technological and testing developments and for this purpose the section responsible for standardization in the electrical industry initiated work on low tension porcelain insulators, electric fans of all types, bayonet lampholders, iron clad switches, lead-acid storage batteries, radio components, radio receivers, amplifiers, loudspeakers and loudspeaker systems, aerial and hook-up wires, condensers for electric

fans, bushings for transformers, collection of data on field strengths to fix optimum performance requirements of different characteristics for community radio receivers, climatic tests for electronic components, dry cells for communication, signalling, cadmium plating and electroplating.

The following laboratories and institutions actively collaborated and carried out these investigations on behalf of the ISI:

All India Radio Merchants' Association, Bombay
All India Radio, New Delhi
Central Electro-Chemical Research Institute, Karaikudi
Chloride and Exide Batteries (Eastern) Private Ltd., Calcutta
Crompton Parkinson (Works) Private Ltd., Bombay
Directorate of Technical Development, Army Headquarters
Eastern Batteries Ltd., Bombay
Government Test House, Calcutta
Hindustan Aircraft Ltd., Bangalore
Indian Institute of Science, Bangalore
National Carbon Co. (India) Ltd., Calcutta
National Ekco Radio and Engineering Co. Ltd., Bombay
National Metallurgical Laboratory, Jamshedpur
National Physical Laboratory, New Delhi
Radio Engineering Department, Andhra Government, Andhra
Radio Manufacturers' Association of India, Calcutta
Radio Research Committee of Council of Scientific & Industrial Research, New Delhi
Rural Broadcasting Department, Bombay
Solar Batteries and Flash Lights Ltd., Bombay
Standard Batteries Ltd., Bombay
Technical Development Establishment, Electronics, Bangalore.

1.11 Second Five-Year Plan for ISI — In the formulation of its second five-year plan, the ISI not only took into consideration the current demand for its services but also made an estimate of the demand that may arise during the plan period from the rapidly expanding industry. To meet this demand the expansion required was found to be out of practical reach, considering the several limitations placed on it due to the paucity of financial resources, lack of man-power, limited accommodation, etc. Consequently, a modest target was set for the formulation of 800 Indian Standards during the plan period. Even in achieving this modest figure, one of the main drawbacks which the Institution has to solve, in common with other institutions of its kind, is the scarcity of proper kind of technical personnel.

1.11.1 *ISI Service Cadre* — During the past few years, the ISI has found it increasingly difficult to recruit senior staff within a reasonable period. Even now in spite of repeated attempts some posts have remained unfilled for periods approaching a year or more. To solve this problem, the ISI has created a service cadre in which recruitment will start at the lowest rung where promising young graduates will be taken in through selection — test and interview — as probationers. They will be given assurance of a professional career which may ultimately enable them to aspire for the highest posts in the Directorate. These young men, designated as Extra Assistant Directors (Probationer), after recruitment will be intensively trained within the framework of the Institution for a period of two years before being regularly posted as Extra Assistant Directors.

The rules for the Indian Standards Institution Service Cadre were drafted by a small committee consisting of Shri M. K. K. Nayar, Shri Kirpa Ram and Dr. Lal C. Verman and were accepted with certain amendments by the Executive Committee in its 44th and subsequent meetings. The rules came into effect on 1 April 1957.

As provided in the service cadre rules, the eligible technical staff of ISI have now been absorbed in the ISI service cadre. The cadre includes the Director, Joint Director, Deputy Directors, Assistant Directors, Extra Assistant Directors (hitherto known as Technical Officers) and Extra Assistant Directors (Probationers) to be recruited in accordance with the procedure laid down under these rules.

1.12 Distinguished Visitors — During the year a number of delegations, parties of students and other dignatories visited the Institution.

Shri Morarji Desai, President ISI and Union Minister for Commerce & Industry, was pleased to pay a visit to the ISI headquarters on 8 January 1957. He spent over an hour with the officers who apprised him of the work in their respective fields. Before coming to the headquarters, he visited the ISI Building under construction on Mathura Road.

Among others who visited the ISI Headquarters, were:

Shri Swaran Singh, Minister for Works, Housing & Supply

Mr. H. A. R. Binney, Director, British Standards Institution

Mr. J. S. Cameron, President, Canadian Standards Association

Mr. M. F. E. Khan, Director, Pakistan Standards Institution

Professor Dr. Richard Vieweg, Director, Physikalische Technische Budesanstalt, Germany

Mr. G. A. Barnard, Professor of Statistics, Imperial College of Science and Technology, London

Miss Kay Daniel, Statistician World Health Organization, Madras

Mr. H. Khalifa, Lecturer, Cairo University, Egypt

Civil Engineering Students of Rayalseema Polytechnic

Students of Indian Statistical Institute

Students from Andhra University

Extension Officers (Industries), Trainees of the Small Scale Industries Directorate

Mr. Binney addrssed the ISI Staff on 11 February 1957.

2. DIVISIONS AND SECTIONS

2.0 Introduction — The activities of the different Divisions and Sections with notable features of the several projects are briefly described in this part of the Report.

2.0.1 In all 287 proposals were received for formulating new Indian Standards during the year, out of which 234 were accepted and referred to various committees.

2.0.2 The progressive growth of the activities of the ISI as reflected by the creation of new committees, increase in committee members and the number of meetings held is illustrated in a convenient manner in Fig 1.

2.0.3 Similarly, Fig 2 indicates the progress actually made in terms of standards published and draft standards circulated.

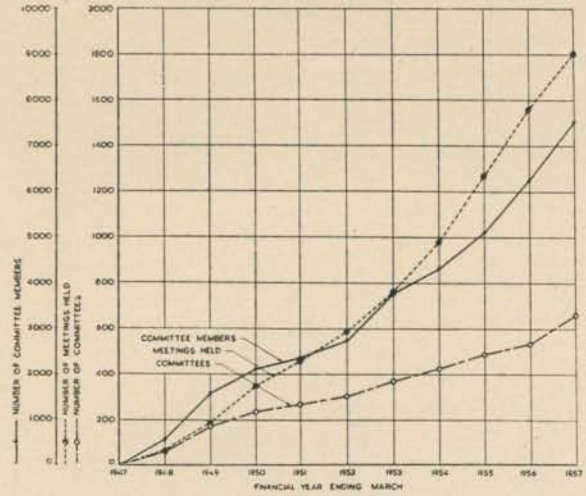

FIG 1 GROWTH OF ACTIVITIES OF COMMITTEES

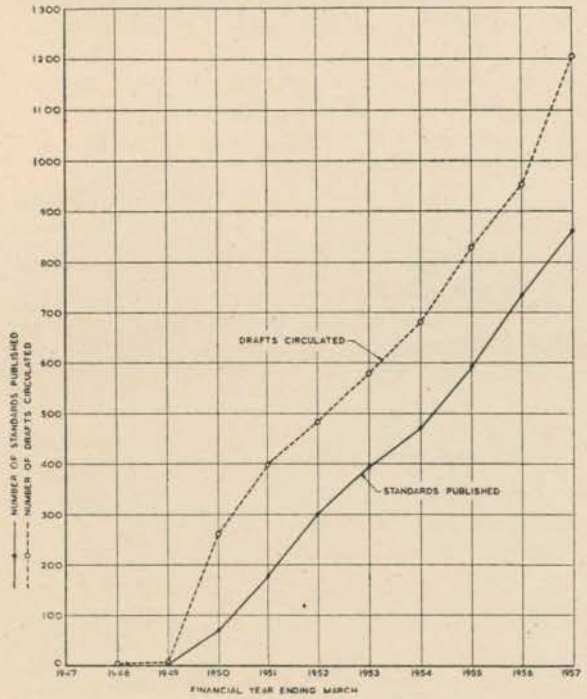

FIG 2 GROWTH OF STANDARDS

2.1 Engineering Division—An important aspect of the work done by the Engineering Division Council during the year under review, related to certain basic standards required in connection with the changeover to the metric system. A guide for inter-conversion of values from one system of units to another was published. A simple and ready-to-use standard guide for precise conversion of inch and metric dimensions on engineering drawings was under advanced stage of development. A standard on preferred numbers, which could be considered in certain respects as a basic standard was under print. At the request of the Standing Metric Committee of the Government of India high priority was given to the preparation of standard specifications for commercial metric weights and measures.

Another important and basic project handled during the year related to screw threads. An Indian Standard based on the draft ISO Recommendation and covering sizes below 6 mm was brought out.

Other important projects which received the attention of the appropriate committees covered the needs of protected industries, such as bicycles, internal combustion engines, vertical and horizontal spindle pumps, hurricane lanterns, oil pressure lamps, etc. Special attention was also paid to the formulation of standards for small scale and cottage industry products.

2.1.1 The ninth meeting of the Engineering Division Council was held on 27 March 1957 under the chairmanship of Shri S. L. Kirloskar. The Council elected Dr. B. D. Kalelkar, Industrial Adviser (Eng), Government of India, as its vice-chairman and discussed, among other subjects, the implications of the changeover to the metric system with particular reference to mechanical engineering industries.

2.1.2 The Standing Working Committee of the Engineering Division Council held its thirteenth meeting on 11 March 1957. The SWCE accepted 13 new subjects for formulation of standards during the year under review which included automobile parts, such as wheels, rims, wheel cylinders and master cylinders cups; gauges of different types including slip gauges; standard nomenclature for hand tools; spring balances; platform weighing machines; steel yards; weighing scales, and personal weighing machines. It was also decided to re-organize the Automotive Vehicles and Internal Combustion Engines Sectional Committee into (a) Internal Combustion Engines, and (b) Automotive Vehicles, Sectional Committees.

2.1.3 The record of work for the year under this Division is summarized in the following figures:

No. of meetings of sectional committees and subcommittees	30
New standards published and in press	21
Standards revised	—
Amendments to standards	—
Draft standards finalized	11
Draft standards widely circulated	26
Draft standards compiled	55
Draft standards under preparation	101

2.1.4 The work of the Division during the year covered the following fields:

i) General Engineering Standards
ii) Oil Burning Domestic Appliances
iii) Machine Tools and Small Tools
iv) Hand Tools
v) Abrasives
vi) Automotive Vehicles and Internal Combustion Engines
vii) Gas Cylinders
viii) Drawings
ix) Safes
x) Bicycles
xi) Screw Threads, Bolts, Nuts and Washers
xii) Sports Goods
xiii) Cutlery
xiv) Engineering Hardware and Equipment
xv) Pencils
xvi) Sewing Machines
xvii) Pumps
xviii) Optical, Drawing and Surveying Instruments

xix) Cargo Marking
xx) Ball Bearings
xxi) Boilers
xxii) Weights and Measures
xxiii) Pulleys and Belts

2.1.5 A brief account of work accomplished during the year under each of these fields is given below:

i) *General Engineering Standards* — The Government of India are speedily pushing their plans for the introduction of metric system in the country within ten years. The Indian Standards Institution also, has adopted a programme for gradual introduction of metric system in Indian Standards. With a view to assisting the various technical committees in the realization of this programme and to co-ordinate their efforts, a few standards were compiled for guidance of those concerned with drafting and processing of Indian Standards. The guide for inter-conversion of values from one system of units to another, prepared for this purpose, has also been submitted to the ISO Technical Committee No. 12 Quantities, Units, Symbols, Conversion Factors and Conversion Tables to form basis of discussion for preparing an International Standard.

Publications

IS: 787-1956 Guide for Inter-Conversion of Values from One System of Units to Another
IS: 1076-1956 Preferred Numbers

Work in Hand

Guide for precise conversion of inch and metric dimensions on engineering drawings

ii) *Oil Burning Domestic Appliances* — The comments received on draft standards for hurricane lanterns and glass globes for hurricane lanterns, as a result of wide circulation necessitated further investigations before the drafts could be finalized. These investigations, which covered the characteristics of fuel consumption, luminous intensity, lighting efficiency and storm proofness, were arranged for at the Government Test House, Calcutta, and Technical Development Establishment, Stores, Kanpur. The results of these investigations will be taken into account when finalizing the standards early next year.

Two draft standards covering lantern type oil pressure lamps and pressure stoves were put into wide circulation and work was initiated on gas mantles for pressure lamps.

Work in Hand

Hurricane lanterns
Glass globes for hurricane lanterns
Lantern type oil pressure lamps
Pressure stoves
Chimneys for oil pressure lamps
Gas mantles

iii) *Machine Tools and Small Tools* — Attempts were continued to evolve standards for testing performance of machine tools. Preliminary test charts for lathes up to 800 mm swing over the bed, drilling machines, planing machines and shaping machines were under active consideration.

A draft standard for limits and fits, which is of interest to machine tools and other engineering industries, was circulated for comments.

Work in Hand

Test charts for lathes up to 400 mm swing over the bed
Test charts for lathes over 400 mm swing over the bed
Testing of accuracy — radial drilling machines
Testing of accuracy — pillar type drilling machines
Testing of accuracy — planing machines
Testing of accuracy — shaping machines
Testing of accuracy — knee type horizontal and universal milling machines
Limits and fits for engineering
Reamers
Milling cutters
Hacksaw blades
Morse taper shanks
Safety code for machine tools
Preferred series of diameters
Preferred series of speeds

iv) *Hand Tools and Agricultural Implements* — Hand tools and agricultural implements are being made in the country both on large scale as well as small scale basis. The shapes and sizes of such tools and the materials used in their manufacture vary from manufacturer to manufacturer. Four standards covering axes, swages, tongs, flatters and fullers were published to help in regulating their quality. Some progress was also made in the revision of tentative standards for shovels, and picks & beaters which were originally published in 1953.

Publications

IS: 703-1956 Axes
IS: 842-1956 Smith's Swages
IS: 843-1956 Smith's Tongs
IS: 846-1956 Smith's Flatters
IS: 847-1956 Smith's Fullers

Work in Hand

Hand hammers
Screw drivers
Brace smith
Swage blocks and stand
Chaff cutter blades
Shears
Vices, bench and hand
Pliers
Forks for plantations and estates
Sickles
Transplanting spades
Holing spades
Post hole diggers
Engineers' files and rasps

v) *Abrasives* — The baffling problem of assessing the quality of abrasives of different types continues to face not only India but other countries as well. The Government Test House, Calcutta, and the Technical Development Establishment, Stores, Kanpur, continued their investigations to evolve a suitable method for testing and evaluating performance requirements. In the meantime a standard for valve grinding paste was published and a draft standard for abrasives glue (bond) was finalized.

Publication

IS: 1004-1956 Valve Grinding Paste

Work in Hand

Coated abrasives (glue bond)
Abrasive specialities
Recommendations for selection of grinding wheels
Standard shapes and sizes of grinding wheels and segments

vi) *Automotive Vehicles and Internal Combustion Engines* — Two standards covering sparking plugs and the methods for testing them were brought out. Sufficient progress was also made in two other draft standards covering general requirements for leaf springs for automobile suspension and piston rings.

In addition, four draft standards covering testing codes for different types of engines were approved for wide circulation.

Publications

IS: 1062-1957 Methods of Testing Sparking Plugs
IS: 1063-1957 Sparking Plugs

Work in Hand

Automobile engine poppet valves
General requirements for leaf springs for automobile suspension
Helical springs for automobile suspension
Aluminium alloy pistons
Cast iron pistons
Cylinder sleeves
Piston pins (gudgeon pins)
King pin and ball studs
Circlips
Single cylinder fuel injection pumps
Guides
Valves and valve seat inserts
Cup washers and cutters
Driving devices (including pulleys normally used therewith)
Radiator and cooling assembly
Thin walled bearings
Keys and keyways for internal combustion engines
Oil seals
Nozzle holders for injectors
Filter (air, fuel and oil)
Spring hangers and shackles
Shackles pins and bushes
Spring pins and bushes
Shock absorbers
Test code for internal combustion engines for marine, diesel and petrol

vii) *Gas Cylinders* — The activities of the Sectional Committee dealing with gas cylinders were confined to collaboration with ISO Technical Committee on Gas Cylinders. Draft ISO Recommendations covering identification of medical gas cylinders and non-interchangeable pin index system for small gas cylinders were considered for adoption as Indian Standards.

viii) *Drawings* — The decision of the Government of India to introduce metric system of weights and measures has necessitated early revision of IS: 696-1955 Code of Practice for General Engineering Drawings. Work on this project was initiated and the recommendations of the ISO Technical Committee on Drawings were being carefully studied with a view to falling in line with the international practice as far as possible.

Work in Hand

Revision of IS: 696-1955 Code of Practice for General Engineering Drawings

ix) *Safes* — A standard for safes was published in 1954. An amendment was introduced during the year under review which made it obligatory for the body of a safe complying with the Indian Standard to be of not less than 12-bend construction, but preferably of 16-bend construction. Another standard in the series published this year covered cash boxes.

Publications

IS: 1046-1957 Cash Boxes
Amendment No. 1 to IS: 550-1954 Specification for Safes

x) *Bicycles* — Among the light engineering industries, the bicycle industry continued to receive a good measure of attention. At the last Tariff Commission inquiry into the bicycle industry, considerable interest was evinced in Indian Standards for bicycle components. A view was also expressed at that occasion that the standards were over-elaborate but such a step would be found to be logical when it was borne in mind that besides the large-scale manufacturers, the industry consisted of a very substantial small-scale manufactures as well. The specifications were, therefore, drawn up deliberately in a somewhat detailed manner so that they might provide guidance to the small-scale sector of the industry.

Work in Hand

Bicycle front forks
Bicycle steering head assembly
Bicycle bottom bracket assembly
Free-wheels
Chain-wheels and cranks
Cotterpins, washers and nuts
Brake assembly
Bicycle rim tapes
Tyres
Tubes
Saddles
Bells
Lamps
Pumps and pump clips
Carriers
Stand
Six hole spanner
Oil cans
Cone spanner
Tyre lever
Chain cover
Rear reflectors
Grips
Lugs
Bottom brackets shells
Lamp brackets
Pump nipples
Mudguards
Tool bags
Chain adjusters

xi) *Screw Threads* — An important and basic project handled during the year related to screw threads. The question of unification of screw thread standards has been engaging the attention of a technical committee of the International Organization for Standardization for some years. A draft ISO Recommendation covering sizes below 6 mm had been evolved, and based on that draft Recommendation, an Indian Standard was published. Work was also in progress both at the national level and at the level of the ISO, on the larger sizes.

Publications

*IS: 554-1955 Pipe Threads for Gas List Tubes and Screw Fittings
IS: 886-1956 Dimensions for Screw Threads (Below 6 mm)

Work in Hand

Dimensions for screw threads (above 6 mm)
Recommendations for part number coding system for screw fasteners

*This standard was under print on 31-3-1956 and has therefore, not been included in Appendix 4.1 on p. 62.

Spanners
Taper pins
Bolts for aircraft
Nuts for aircraft
Plain washers for aircraft
Rivets for aircraft

xii) *Sports Goods* — In pursuance of a recommendation of the Export Promotion Committee of the Government of India, high priority was given to the preparation of standards for sports goods. Consequently standards for the more important items have been prepared or are in advanced stages of development. Work was initiated on the revision of three tentative Indian Standards for shuttlecocks, cricket and hockey balls, foot balls, volley-balls, etc, which were published in 1954. Arrange ments were also being made for research work to be carried out at the Forest Research Institute, Dehra Dun, and the Wood Working Institute, Bareilly, for finding out suitable species of indigenous timbers for the manufacture of gymnasium equipment.

Publications

*IS: 827-1956 Sinew Guts
*IS: 828-1956 Cricket Bats
*IS: 829-1956 Hockey Sticks

Work in Hand

Revision of IS: 415-1953 Shuttlecocks
Revision of IS: 416-1953 Cricket and Hockey Balls
Revision of IS: 417-1953 Footballs, Volley-Balls, Basket-Balls and Water Polo Balls
Tennis rackets
Badminton rackets
Squash racket frames
Cricket stumps
Ping pong bats
Nets for tennis, badminton, volley-ball, table tennis, etc,
Leg guards for cricket batsmen, wicket keepers, and hockey goal keepers
Wicket keeping gauntlets
Batting gloves
Athletic goods
Track and field sports goods
Gymnasium equipment

xiii) *Cutlery* — Five standards for razors, knives and forks were published. In addition, two draft standards for spoons were finalized and another five for household cutlery were circulated for comments.

Publications

IS: 888-1956 Hollow Ground Razors, Open Type
IS: 992-1957 Forks (Table, Fish and Serving), Stainless Steel
IS: 993-1957 Forks (Table, Fish and Serving), Brass and Nickel Silver
IS: 994-1957 Fish Knives and Butter Knives
IS: 995-1957 Table Knives, Dessert Knives and Fruit Knives
IS: 989-1956 Scissors

Work in Hand

Spoons, stainless steel
Spoons, brass and nickel silver
Steel pen knives
Butcher knives
Bread knives, table-serrated edge
Cook knives
Carving knives, fibre handle

xiv) *Engineering Hardware and Equipment* — Four preliminary draft standards covering steel wire ropes for different purposes, and fibre cores for steelwire ropes were approved for wide circulation. These draft standards recognize both basic as well as acid open hearth steels for the manufacture of wire ropes.

Work in Hand

Steel wire ropes for colliery winding and haulage purposes
Steel wire ropes for cranes, lifts and other engineering purposes
Fibre cores for steel wire ropes
Code of practice for selection and maintenance of wire ropes

xv) *Pencils* — A draft standard covering the requirements for drawing pencils, carpenters' pencils, stenographers' pencils and pencils for general writing was approved for wide circulation. The results of investigations carried out at the National Physical Laboratory of India for evolving tests for evaluating the quality of pencils were taken into account in formulating this draft standard.

Work in Hand

Black lead pencils

xvi) *Sewing Machines* — The sewing machine industry is another instance of a growing small-scale industry to which guidance is expected to be provided through standards. It was agreed to cover designs of component parts of two popular types of machines. Five draft standards were approved for wide circulation.

Work in Hand

General requirements for sewing machines (household)
Embroidery plate
Bobbins
Needle bars
Pressure foot
Pressure bars
Shuttle
Bobbin case spring screw
Needle
Thread take up lever
Stud for take up lever

xvii) *Pumps* — The two subcommittees set up last year to formulate standard specification for vertical and horizontal spindle pumps warmed up during the year under review and drew up draft proposals on the following subjects:

Work in Hand

Vertical spindle pumps (turbine type)
Horizontal centrifugal pumps primarily for water
Methods for testing horizontal spindle pumps

xviii) *Optical and Mathematical Instruments* — In establishing indigenous manufacture of optical, drawing and surveying instruments and in formulating standards for them, it has been considered essential to bear the following basic factors in mind:

a) Rationalization of essential requirements and, therefore, of the types of any particular instrument required to meet different roles in which it is used. The number of types should be the absolute minimum, consistent with the user requirements,

b) Standardization of sizes, materials and manufacturing processes so that there was a large degree of uniformity in instruments of the same type produced by different manufacturers,

*The standards were under print on 31-3-1956 and have, therefore, not been included in Appendix 4.1 on p. 62.

c) Utilization of indigenously produced or available material as far as possible, and

d) Tropicalization of instruments as an essential desideratum, wherever feasible, as the instruments are required to be manufactured, stored and used under tropical conditions prevalent in India.

These basic considerations were borne in mind in preparing six draft Indian Standards on drawing boards, tee-squares, slide rules (linear type), surveyor's compasses, prismatic compasses, and trough and tubular compasses.

Work in Hand

Drawing boards
Tee-squares
Slide rules (linear type)
Surveyor's compasses
Prismatic compasses
Trough and tubular compasses
French curves
Set-squares
Box type drawing instruments
Scales of various types (excluding survey type)
Drafting machines
Ferro-printing frames
Protractors
Parallel rulers
Glossary of terms used in optical instruments
General requirements for optical components
General requirements for optical instruments
Bubbles
Levels
Theodolites

xix) *Cargo Marking* — The question of evolution of a standard and uniform system of marking packages with suitable symbols indicating the special type of handling they require at all stages in transit and more particularly in the docks at the time of export and import has been exercising the minds of port authorities, chambers of commerce, trade associations, importers, shipping and insurance companies, marine surveyors and the like for sometime. It is a well known fact that illegible and confused cargo marks are a major source of irritation to port operators on account of the added work and congestion which is involved in sorting and tallying. It was, therefore, felt that if a relatively simple set of symbols readily intelligible to both literate and illiterate labour, is evolved, it will assist all concerned in expeditious handling of goods in transit. Consequently, a draft was prepared and circulated to all concerned for comments and suggestions for improvement.

Work in Hand

Recommendations for pictorial marking of handling instructions for non-dangerous goods

NOTE — Work on marking of handling instructions for dangerous goods is being carried out by another committee, *see* **2.4.5** (xiv) (p. 27).

xx) *Ball Bearings* — Ball and roller bearings are being made in considerable qualities in India. Another manufacturing unit has been planned and is likely to commence production within the Second Five-Year Plan period. The need to rationalize sizes and to lay down tests for evaluating minimum performance requirements received attention and arrangements were made for the National Physical Laboratory of India to investigate the problem of measurement of noise levels. The work being done at the international level was also being watched carefully.

Work in Hand

Ball and roller bearings for general engineering applications

xxi) *Boilers* — The Boilers Sectional Committee held its first meeting in Hyderabad in July 1956. The scope of the committee vis-a-vis the Central Boilers Board, which is the statutory organization responsible for framing boiler regulations, and the detailed procedure to be followed for effective collaboration between the two bodies were discussed and certain conclusions reached. The Committee set up seven subcommittees to deal with:

a) Boilers construction materials,

b) Construction and workmanship of boilers,

c) Boiler design,

d) Boiler mountings and fittings,

e) Welding and riveting of boilers,

f) Testing, inspection, certification and despatching of boilers, and

g) Operation and maintenance of boilers.

xxii) *Weights and Measures* — Metric weights and measures are one of the important responsibilities of the ISI. The Institution was represented on the Standing Metric Committee of the Government of India and had been charged with the work of preparing standards for weights and volumetric and linear measures. Indian Standards for commercial metric weights and volumetric measures were finalized and work on linear measures made reasonable progress.

Work in Hand

Commercial metric weights
Commercial metric capacity measures
Metric glass dispensing measures
Commercial metric length measures (non-flexible)
Metric metallic cotton tape measures
Metric steel tapes
Metric carat weights

xxiii) *Pulleys and Belts* — The belting industry is a protected industry and has been trying to improve its quality from time to time. Efforts were made to assist this industry through standardization and draft revisions of the two standards for cotton belting and hair belting, published in 1954, were circulated for comments. In addition, draft standards for friction surface rubber transmission belting, cast iron and mild steel flat pulleys and belt fasteners were issued in wide circulation.

Work in Hand

Revision of IS: 529-1954 Solid Woven Impregnated Cotton Belting for Power Transmission
Revision of IS: 530-1954 Solid Woven Impregnated Hair Belting for Power Transmission
Friction surface rubber transmission belting
Cast iron and mild steel flat pulleys
Belt fasteners
Solid woven rubberized cotton belting for power transmission
Conveyor belting (woven cotton)
Elevator belting (woven cotton)
'V' Belts (including fan belts)
Canvas plied transmission belting

2.2 Building Division — During the year under review, the Building Division continued to make good progress in the preparation of standard specifications and standard codes of practices. Among the important standards published during the year and those that were under print, mention may be made of the Code of Practice for Plain and Reinforced Concrete for General Building Construction (*Revised*), Materials for Use in the Manufacture of Magnesium Oxychloride Flooring Composition, a Code of Practice for Magnesium Oxychloride Composition Floors, Concrete Pipes (With and Without Reinforcement), Concrete Poles for Overhead Power and Telecommunication Lines, Building Limes, Use of Structural Timber in Building (Material, Grading and Design) and a Code of Practice covering Structural Safety of Buildings: Loading Standards. Besides, a series of specifications on builder's hardware for different types of locks, fixing accessories for corrugated sheet roofing, were published. A number of standards relating to sanitary appliances and water fittings were also issued.

Among the new subjects taken up during the year were further items on fire fighting equipment, code of practice for damp proofing and water proofing of buildings, burnt clay hollow bricks and engineering bricks, hardware items, such as wire netting for fencing and cold rolled mild steel butt hinges, and domestic refrigerators and small air conditioning units. A broad classification of soils for general engineering purposes was also taken up for consideration.

As a preliminary essential step towards the introduction of metric units in the building industry, a draft Indian Standard establishing equivalent metric units for dimensions, scales and quantities in general construction work, covering the entire building field was prepared under the direction of the SWCB. When this draft is finalized it is expected to serve as a basic and important step in the adoption of the metric system by the building industry.

Among the subjects which received special attention during the year, may be mentioned the code of practice for painting of iron and steel in buildings, code of practice for orientation and ventilation of buildings, daylight standards for houses, flats and schools, code of practice for sound insulation of buildings, code of basic requirements for water supply, drainage and sanitation and code of practice for steel bridges, both for road and rail traffic. The codes dealing with building bye-laws and electrical wiring and fittings in buildings were processed to their final stage.

2.2.1 The Building Division Council held its fifth meeting on 26 March 1957 under the chairmanship of Shri E. A. Nadirshah. The Council elected Shri B. P. Kapadia as representative of the BDC on the General Council for the period 1 January 1957 to 31 December 1959 in place of Lt-Gen H. Williams. The Council also appointed Shri D. P. Asar as chairman of the Doors, Windows and Building Furniture Sectional Committee.

2.2.2 The Standing Working Committee of the Building Division Council, at its meeting in November 1956, reviewed the composition of the Building Construction Practices and Bye-laws Sectional Committee (BDC 13), and with a view to giving greater emphasis to water supply and drainage, electrical wiring and fitting of buildings and building bye-laws, set up three separate sectional committees to deal with these subjects. This re-organization made it possible to give special attention to the preparation of codes of practice for water supply, plumbing and drainage in view of the importance attached to these subjects by the Ministry of Health.

2.2.3 The record of work for the year under this Division is summarized in the following figures:

No. of meetings of sectional committees and subcommittees	51
New standards published and in press	20
Standards revised	2
Draft standards widely circulated	64
Draft standards compiled	67
Draft standards under preparation	8

2.2.4 The work of the Division during the year covered the following fields:

a) Building Material Specifications
   i) Cement and Concrete
   ii) Lime and Gypsum
   iii) Pozzolanas
   iv) Bricks and Stones
   v) Timber and Wood Products
   vi) Builder's Hardware
   vii) Tar and Bitumen
   viii) Floor and Roof Covering
   ix) Doors and Windows
   x) Service Equipment and Accessories

b) Codes of Practice for Buildings
   i) Building Design
   ii) Building Construction
   iii) Building Regulation and Control
   iv) Building Services and Equipment

c) General Civil Engineering (Standards and Codes)
   i) Fluid Flow Measurement
   ii) Bridges
   iii) Soil Engineering
   iv) Sieves
   v) Fire Fighting Equipment

2.2.5 A brief account of the work done during the year in each of the fields is given below:

a) Building Material Specification

i) *Cement and Concrete* — Consequent to the investigations and research work carried out under the Cement and Concrete Sectional Committee, Indian Standard Specification for Ordinary Rapid-Hardening and Low Heat Portland Cement (IS: 269-1951) was revised and circulated for comments. The revision takes fully into account the quality of the cement produced in the country and the limitations regarding testing equipment, simplification of test procedures and manufacturing problems. Several research problems made notable progress. A standard on methods of testing concrete was finalized; a specification for methods of tests for determination of free lime in Portland cement was

circulated. Draft specifications for asbestos cement building pipes and fittings, and mild steel and high tensile steel deformed bars for concrete reinforcement were got ready for circulation.

Publications

IS: 458-1957 Concrete Pipes (With and Without Reinforcement)
IS: 785-1957 Concrete Poles for Overhead Power and Telecommunication Lines

Work in Hand

Revision of IS: 269-1951 Ordinary, Rapid-Hardening and Low Heat Portland Cement
Methods of test for determination of free lime in Portland cement
Methods of testing concrete
Natural aggregates and manufactured aggregates for use in mass concrete
Mild steel and high tensile steel deformed bars for concrete reinforcement
Cement concrete flooring tiles
Prestressed concrete pipes
Asbestos cement building pipes and fittings (spigot and socket type)
Asbestos cement pressure pipes
Street lamp standards

ii) *Lime and Gypsum* — The specification for building limes was sent for printing. With the publication of this specification, it is hoped that advantage would be taken to use lime to the fullest extent and thereby assist in relieving the serious shortage of cement in the country. Investigation on utilization of gypsum as a building material was initiated at the Central Building Research Institute, Roorkee. The programme of research will cover gypsum wall boards, both in regard to the method of manufacture as well as their use in buildings.

Publication

IS: 712-1956 Building Limes

Work in Hand

Gypsum wall boards
Gypsum hollow partition tiles
Gypsum hollow blocks
Gypsum plaster for finishing purposes

iii) *Pozzolanas* — Further work was done on a specification for the use of pozzolanas. The investigation carried out by the Concrete Research Laboratory, Madras, and others has been of value in this work. Studies on masonry mortars using lime pozzolana mixtures have been undertaken which, it is hoped, will lead towards the establishment of specifications for masonry cements. A draft standard on methods of tests for pozzolanic materials was under consideration.

iv) *Bricks and Stones* — Substantial work was done in the field of bricks and stones. A basic specification for common building brick with dimensions conforming to a module of 10 cm was established. Draft standard covering methods of test on building stones and dimensions for different types of stones, also based upon a 10 cm module, were finalized. This important step in the direction of modular co-ordination of dimensions in buildings by adopting a modular brick is expected to achieve substantial economies in building construction.

An item of interest which is under consideration is in regard to classification of building stones and their regional distribution in India. This standard when published, it is hoped, will serve as a ready guide to engineers regarding stones available in their area, their suitability for different purposes and their physical and chemical properties.

Work in Hand

Common burnt clay building bricks
Lime stone slabs
Dimensions and workmanship of natural building stones
Method of test for water absorption of natural building stones
Method of carrying out strength test on natural building stones
Method of test for determining specific gravity and porosity of natural building stones
Method of carrying out weathering test on natural building stones
Method of carrying out durability test on natural building stones
Petrographical examination of natural building stones
Classification of natural building stones, their distribution, characteristics and usability
Dressing of natural building stones

v) *Timber and Wood Products* — Important aspects of standardization relating to timber and wood products were considered during the year. Among these were standard sizes of timber and quality grading of timber. A specification for wood poles for overhead power and telecommunication lines was sent for printing. This specification is hoped to provide as a good guide for extraction of poles from forests and increasing their availability to various electricity undertakings in India. Specifications for marine plywood and aircraft plywood were got ready for issue and a number of standards for adhesives used in plywood manufacture also reached finalization. The technical committee concerned has taken up review of the Indian Standard Specification for Common (Commercial) and Moisture Proof Plywood (IS: 303-1951) with a view to making the different grades of plywood conform to the actual qualities of plywood produced by the different plywood factories in the country. This basic work will align the standards more specifically with the qualities manufactured in the country.

Publication

IS: 876-1957 Wood Poles for Overhead Power and Telecommunication Lines

Work in Hand

Abbreviated symbols for timber species
Glossary of terms applicable to timber, plywood and joinery
Code of practice for seasoning of timber
Cut sizes of timber and their grading
Non-coniferous bulk timber
Marine plywood
Medium strength aircraft plywood
Commercial (common) plywood
Moisture proof plywood
Logs for matches
Natural sour (lactic) casein for glue manufacture
Cold setting casein glue for wood
Synthetic resin adhesives for plywood (phenolic and aminoplastic)

Cold setting synthetic resin adhesives for construction work in wood
Animal glue
Extenders for adhesives
Classification of adhesives
Rectangular packing cases from solid wood
Code of practice for testing of plywood

vi) *Builder's Hardware* — A number of standards covering hardware items were published during the year. Indian Standard Specification for Locks (IS: 275-1951) was revised to deal specifically with the locks produced by the cottage industry and a separate specification for brass locks manufactured by large factories was issued. The technical committee concerned reviewed various standards on door and window fittings, and after taking note of different types of fittings marketed for different levels of consumers, decided to increase the number of types covered by the specification.

Publications

IS: 275-1957 Padlocks (*Revised*)
*IS: 725-1956 Copper Wire Nails
*IS: 726-1956 Mild Steel Buckets for General Use and for Fire Fighting Purposes
*IS: 729-1956 Brass Drawer Locks, Cupboard Locks and Box Locks
*IS: 730-1956 Fixing Accessories for Corrugated Sheet Roofing
IS: 1018-1957 M Type Brass Padlocks
IS: 1019-1957 Rim Latches

Work in Hand

Cold rolled mild steel butt hinges
Mild steel square or hexagon head coach screws with gimlet points
Tinmens' rivets
Metal rain water pipes, gutters, fittings and accessories
Mild steel dustbins
Wire gauge, mosquito proof

vii) *Tar and Bitumen* — In the field of tar and bitumen the main work accomplished was in regard to methods of testing. The various differences in regard to the use of equipment, procedures and also duplication were eliminated by the preparation of a draft standard covering physical and chemical methods of test for tar and bitumen. A review of Specification for Creosote and Anthracene Oil for Use as Wood Preservative (IS: 218-1952) is in progress and note is being taken of the fact that creosote is in short supply in the country and may have to be augmented by certain temporary relaxation in regard to the distillation range.

Work in Hand

Methods for testing tar and bitumen, section I — sampling
Methods for testing tar and bitumen, section II — physical tests:
Determination of specific gravity
Determination of penetration
Determination of softening point
Determination of residue of specified penetration
Determination of viscosity
Determination of equiviscous temperature (EVT)
Determination of ductility
Determination of flash point and fire point
Float test
Methods for testing tar and bitumen, section III — chemical tests:
Determination of water content (Dean and Stark method)
Determination of loss on heating
Distillation test
Determination of matter insoluble in benzole
Determination of matter insoluble in toluole
Determination of solubility in carbon disulphide
Determination of mineral matter (ash)
Determination of phenols
Determination of naphthalene
Determination of volatile matter content

viii) *Floor and Roof Covering* — Substantial work was done in the field of floor and roof covering. A standard for materials for use in the manufacture of magnesium oxychloride flooring composition and a specification for Mangalore pattern clay roofing tiles were printed, and a draft specification for rubber flooring materials for general purposes reached the final stage.

Publications

IS: 654-1957 Clay Roofing Tiles, Mangalore Pattern
IS: 657-1956 Materials for Use in Manufacture of Magnesium Oxychloride Flooring Compositions
IS: 658-1956 Code of Practice for Magnesium Oxychloride Composition Floors

Work in Hand

Rubber flooring materials for general purposes
Ridge tiles and ceiling tiles
Clay flooring tiles
Mastic asphalt flooring
Bitumenous roofing felts

ix) *Doors and Windows* — Draft specifications for both timber panel glazed doors and windows and steel windows, ventilators and doors were finalized. The dimensions of doors and windows in both standards are modular. This marks an important step again in the introduction of modular co-ordination of dimensions into the building industry. Work was done on specification for flush door shutters and a draft specification for industrial windows was issued for wide circulation. Further investigations were carried out in regard to draft specifications for furniture items used in offices. Testing of some of the furniture items was initiated at the Forest Research Institute, Dehra Dun.

Work in Hand

Timber panelled and glazed doors and windows
Steel windows, ventilators and doors
Industrial windows
Code of practice for fixing and glazing of steel doors and windows
Timber flush door shutters

x) *Services, Equipment and Accessories* — Water supply fittings, sanitary wares, valves and other items received a great deal of attention during the year. Seven specifications were sent for publication. A draft specification for gunmetal gate, globe and check valves for water, steam and oil was finalized and a draft specification for bib taps and stop taps was widely circulated.

Publications

IS: 772-1956 General Requirements of Enamelled Cast Iron Sanitary Appliances
IS: 773-1956 Enamelled Cast Iron Water Closets, Railway Coaching Stock Type

*These standards were under print on 31-3-1956 and have, therefore, not been included in Appendix 4.1 on p. 62.

IS: 774-1957 Flushing Cisterns for Water Closets and Urinals
IS: 775-1957 Brackets and Supports for Lavatory Basins and Sinks
IS: 776-1957 Water Closet Seats and Covers
IS: 779-1956 Water Meters with Threaded End Connections
IS: 780-1956 Sluice Valves for Water Works Purposes
IS: 782-1956 Caulking Lead

Work in Hand

White glazed earthenware sanitary appliances
Gunmetal gate, globe and check valves for water, steam and oil only (not intended for use in petroleum industry)
Sand cast brass screw down bib taps and stop cocks for water services
Water meter boxes
Glazed earthenware wall tiles

b) CODES OF PRACTICE FOR BUILDINGS

i) *Building Design*

Terminology, Notations and Drawings— A draft code of architectural and building drawing office practice prepared earlier was modified and metric dimensions and scales were introduced.

Work in Hand

Code of building terminology
Code of architectural and building drawing office practice
Schedule of unit weights of building materials

Modular Co-ordination — The introduction of metric system and the adoption of modular co-ordination of dimensions in the building industry based on a 10 cm module went ahead side by side. The brick industry, the building stone industry, metal doors and windows industry and timber doors industry adopted a basic module of 10 cm for their standards. The Modular Co-ordination Sectional Committee got ready a draft standard dealing with recommendations for modular co-ordination of dimensions in the building industry. The simplicity and substantial economies which would result from the adoption of this principle are expected to help in the reduction of overall building costs.

Work in Hand

Recommendations for modular co-ordination of dimensions in the building industry

Functional Requirements of Buildings — Several draft codes covering various functional requirements of buildings received considerable attention during the year. Indian Standard Code on Structural Safety of Buildings: Loading Standards (IS: 875-1957) was sent to the press and this will be complementary to IS: 456-1957 Code of Practice for Plain and Reinforced Concrete for General Building Construction as well as to IS: 800-1956 Code of Practice for Use of Structural Steel in General Building Construction. Substantial progress was made on the preparation of draft codes of practice for daylight, orientation and ventilation of buildings. The draft code of practice for sound insulation reached the final stage. The various draft codes on fire safety of buildings received further attention, and in the light of discussions held with the experts at the Building Research Station, UK, the fire grading requirements were revised.

Publication

IS: 875-1957 Structural Safety of Buildings: Loading Standards

Work in Hand

Structural safety of buildings: foundations and superstructures
Code of practice for daylight (for houses and flats)
Code of practice for orientation of buildings
Code of practice for ventilation of dwellings
Code of practice for sound insulation of houses, flats and schools
Code of practice for fire safety of buildings: general principles and fire grading
Code of practice for fire safety of buildings: stairways and escape routes
Code of practice for fire safety of buildings: materials and details of construction
Code of practice for fire safety of buildings: chimneys, pipes and hearths
Code of practice for fire safety of buildings: electrical installations
Code of practice for fire safety of buildings: layout and spacing of buildings
Code of practice for fire safety of buildings: fire fighting equipment and maintenance

ii) *Building Construction*

Plain and Reinforced Concrete — In addition to the revision of Code of Practice for Plain and Reinforced Concrete for General Building Construction (IS: 456-1957), Indian Standard Code of Practice for General Construction of Plain and Reinforced Concrete for Dams and Other Massive Structures (IS: 457-1957) was also finalized and sent to the press. Work was initiated on the preparation of a code of practice for prestressed concrete and the draft is receiving active consideration of the committee.

Publications

IS: 456-1957 Code of Practice for Plain and Reinforced Concrete for General Building Construction (*Revised*)
IS: 457-1957 Code of practice for General Construction of Plain and Reinforced Concrete for Dams and Other Massive Structures

Work in Hand

Code of practice for prestressed concrete

Flooring and Damp Proofing — Codes of practice for laying and maintenance of linoleum floors, mastic asphalt flooring and rubber floors were got ready for circulation. An important aspect of work in this field is the preparation of codes of practice covering damp proofing and water proofing of buildings. Important investigation and experimental work were initiated in regard to the efficacy of various water proofing methods presently used in India, specially those having tar and bitumen as base.

Work in Hand

Code of practice for laying and maintenance of linoleum floors
Code of practice for laying of mastic asphalt flooring
Code of practice for laying of rubber floors

Use of Timber in Buildings — A draft code of practice for use of structural timber in buildings covering material,

grading and design aspects was sent to the press. A number of draft codes covering timber staircases, timber balconies, timber roof covering, ceilings, panelling and flooring made progress. The draft code of practice for seasoning of timber reached the final stage.

Publication

IS: 883-1957 Code of Practice for Use of Structural Timber in Building (Material, Grading and Design)

Work in Hand

Code of practice for fixing devices and methods of fixing in walls and ceilings
Code of practice for fixing devices and methods of fixing in cavity constructions
Wood stairs

Methods of Measurement — A draft code on methods of measurement of building works was circulated widely and the large number of comments received on the draft were examined by the main agencies whose work would be affected by the unification and standardization in this field. This code which is expected to herald the introduction of metric system in the public works departments is expected to be finalized early next year.

Work in Hand

Method of measurement of building works

Building Finishes — A draft code of practice for finishing of iron and steel in buildings was got ready for wide circulation. Work on additional sections for this code dealing with recommendations for materials, testing equipment, etc, was taken in hand. Preliminary work was done on the preparation of codes of practice covering plaster and allied finishes.

A draft code of practice for fixing and glazing of steel doors and windows was also taken up.

Work in Hand

Code of practice for finishing of iron and steel in buildings; painting and allied finishes

iii) *Building Regulation and Control* — A draft code of building bye-laws which was extensively commented upon during its wide circulation was re-examined and several sections were re-drafted. The committee has given careful thought to many fundamental aspects, such as heights of rooms, minimum area of living rooms, etc. The draft code is expected to be finalized early next year and will serve as a very useful guide to the local bodies.

Work in Hand

Code of building bye-laws

iv) *Building Services and Equipment*

Water Supply and Sanitation — The subject of water supply, plumbing and sanitation received great attention during the year and a draft code laying down the basic requirements for water supply, drainage and sanitation was prepared and circulated. Draft codes covering water supply and plumbing and drainage were got ready for consideration by the newly set up sectional committee.

Work in Hand

Code of basic requirements for water supply, drainage and sanitation
Code of practice for water supply and plumbing
Code of practice for drainage

Electrical Installations — A draft code of practice for electrical wiring and fittings in buildings, also extensively commented upon was examined and revised. The revised draft code is expected to be finalized in 1957.

Work in Hand

Code of practice for electrical wiring and fittings in buildings

Refrigeration and Air-Conditioning — The work under the Refrigeration and Air-Conditioning Sectional Committee was reorganized consequent upon the publication of four standards during the previous year. Data continue to be collected regarding the standard design conditions to be specified for air-conditioning systems in different parts of India. Work on a draft specification for domestic refrigerators and room air-conditioners was undertaken. A draft code of practice for the use of different insulating materials was prepared during the year.

Work in Hand

Standard design conditions for air-conditioning in various parts of India
Guide to the use of different types of insulating materials

c) General Civil Engineering (Standards and Codes)

i) *Fluid Flow Measurement* — Four draft standards on liquid flow measurement in open channels were widely circulated. These documents also formed the basis of discussion at the meeting of ISO/TC 30/SC 1 Liquid Flow in Open Channels held in Munich on 9-11 July 1956. They have been accepted as working basis for international recommendations. Investigations on the calibration of current meters manufactured in India have been undertaken with the assistance of the National Physical Laboratory.

Work in Hand

Glossary of terms used in measurement of flow of water in open channels
Measurement of flow of water in open channels by velocity area methods
Measurement of flow of water in open channels using notches, weirs and flumes
Standard forms for recording measurement of flow of water in open channels

ii) *Bridges* — The draft code of practice for the design of steel bridges carrying rail and road traffic made substantial progress and was ready for wide circulation. Extensive investigations in regard to the formulæ used in the code were undertaken during the year and advantage of the presence of UK experts in India at the time of the last Commonwealth Conference was taken to discuss

some of the important aspects of this code.

Work in Hand

Code of practice for the design of steel bridges carrying rail road or pedestrian traffic

iii) *Soil Engineering* — The Soil Engineering Sectional Committee which held its second meeting in February, discussed the organization and programme of work allotted to it and processed on important aspects needing standardization. A broad classification of soils for general engineering purposes, unifying the different systems used in the country was undertaken and a specification for soil cement blocks was under the consideration of the committee.

iv) *Sieves* — Investigations were continued on methods of sieve analysis at the National Physical Laboratory; a sieve shaker was designed and is being fabricated at the Andhra Scientific Co. Ltd., Masulipatam. The important contribution which the ISI has made by publishing a Specification for Sieves (IS: 460-1953) which unified both British and American Practices was given full recognition at the meeting of the International Technical Committee, ISO/TC 24 held in Dusseldrof in June 1956. The Indian proposal based on the Indian Standard is receiving active attention at the international level.

Work in Hand

Standard methods of sieve analysis

v) *Fire Fighting Equipment* — A large number of draft specifications covering various fire fighting equipment were ready for wide circulation. These, along with further draft specifications which would be sent out for wide circulation in 1957 would form a set of comprehensive standards for all types of fire fighting equipment in the country.

Work in Hand

Coupling, double male, instantaneous pattern
Fire hose delivery couplings, suction hose couplings, branch pipe, nozzles and nozzle spanner
Coupling, double female, instantaneous pattern
Breechings, 2-way and 3-way suction (suction collecting head)
Branch with revolving head
Delivery breechings, dividing and collecting, instantaneous pattern
Suction strainers cylindrical and shoe types
Hydrants stand post type
Underground hydrants, sluice valve type
Combined hydrants, cover lift and lower valve key
Underground hydrants, double valve type
Washers
Fireman's axe
Fire hooks
Fire bell
Fire extinguishers, foam type
Fire extinguishers, soda acid type
Fire extinguishers, CTC type
Hook ladder
Wheeled fire escape
Blower and exhauster
80-120 GPM portable pump set for fire fighting
120-220 GPM trailer fire pump for fire brigade use
350-500 GPM trailer pump for fire brigade use
350-500 GPM motor fire engine
700-1000 GPM motor fire engine
Motor fire engine with water tanks of 500 gallons capacity emergency tender
100/110 ft mechanically operated turn-table ladder for fire brigade use
Combined CO_2 and foam crash tender
CO_2 crash tender
Foam crash tender large
Motor fire engine with 350-500 GPM pumps and 1000 gallons water tank (tender/pump)
Rescue tender
Dry powder crash tender
Foam crash tender, small
Control post van for fire brigade use

2.2.6 *Building Standards Information Digest* — The Building Standards Information Digest, which was started four years ago continued to be issued by the Building Division to all the BDC committee members and others who had specifically expressed interest in the digest.

This digest summarizes the information contained in the various technical journals and drafts and printed standards in English, received from different countries, concerning the building field. It concentrates on such information which has specific bearing upon the work that is being done by any of the ISI committees and is of immediate interest. The digest is issued monthly and has found wide acceptance. Its circulation is limited to BDC committee members only; others interested can obtain a copy on request. This service to the committee members has been found to be useful in bringing to their notice recent advances in science and technology connected with standardization in the building industry.

2.3 Textile Division — In its seventh meeting held in Bombay on 19 March 1957, the Textile Division Council (TDC) reviewed the activities of the various sectional committees functioning under it and decided:

a) to re-co-opt a representative of the Federation of Gujerat Mills and Industries, Baroda,

b) to co-opt a representative each of the Madhya Pradesh Millowners Association (MPMA), Indore, and the Ahmedabad Textile Industry's Research Association (ATIRA), Ahmedabad, as its members,

c) to appoint Shri R. M. Patri and a representative of ATIRA and one of Technological Laboratory, Indian Central Cotton Committee, Bombay, as members of its Standing Working Committee (SWCT), and

d) to re-elect Shri Harshavadan Mangaldas to represent the Council on the GC for another term of three years ending 31 December 1959.

2.3.1 The Council endorsed the decision taken by its Standing Working Committee and the Cotton Yarn and Cloth Sectional Committee, TDC 2, to confine the latter's activities to the preparation of textile standards in demand by Government agencies, such as, Defence, Railways, Posts and Telegraph, etc, and by large-scale industrial consumers.

The Council further reviewed its earlier decision to take up the work of formulation of standards for silk goods, specially, silk fabrics, and the consensus of opinion was that it was not advisable to take up this work in view of the fact that the element of fashion played an important part in silk fabrics.

2.3.2 The Standing Working Committee of the Textile Division Council held its fifth and sixth

meetings on 24 May and 8 August 1956, respectively. In its fifth meeting, the SWCT considered the views of the members of the Council on the letter received from the Millowners' Association, Bombay, regarding formulation of standards for cotton fabrics, the views of the various standards bodies on the desirability of laying down standards for consumer articles and the views of the trade associations in the country regarding formulation of standards for cotton fabrics. After prolonged and interesting discussion, the SWCT decided that the ISI should not take up any further work of formulation of standards for cotton fabrics in demand by the everyday consumer.

In its sixth meeting held in joint session with the representatives of manufacturers of knitting machines and their parts, the SWCT decided to take up the work of formulation of standards for knitting machines and their parts, and set up a sectional committee for the purpose.

During the period under review, the SWCT also set up a new sectional committee for wicks for oil burning domestic appliances. Priority was given to formulation of standards for textile test methods and handloom fabrics.

2.3.3 The record of work done during the year is summarized below:

No. of meetings of sectional committees, subcommittees and panels	55
New standards published and in press	41
Standards revised	1
Amendments to standards	5
Draft standards finalized	23
Draft standards widely circulated	13
Draft standards compiled	63
Draft standards under preparation	93

2.3.4 The work of the Division during the year covered the following fields:

i) Physical Methods of Tests
ii) Chemical Methods of Tests
iii) Cotton Yarn and Fabrics
iv) Textile Materials for Aircraft
v) Jute and Jute Fabrics
vi) Woollen and Worsted Fabrics
vii) Handloom Fabrics (Cotton and Woollen)
viii) Coir and Coir Products
ix) Rayon Yarn and Fabrics
x) Ropes and Cordages
xi) Textile Sizing and Finishing Materials
xii) Hosiery Yarn and Knitted Garments
xiii) Textile Mill Stores
xiv) Textile Machinery

2.3.5 A brief account of the work accomplished during the year under each of these fields is given below:

i) *Physical Methods of Tests* — During the period under review four draft Indian Standards covering definitions of terms used in cotton, wool, jute and silk industries were considered, and it was decided that the four drafts be consolidated into one single standard. Also, the draft Indian Standard Definitions of Textile Terms (*Tentative*), was finalized and decision was taken to prepare separate standards to deal with definitions of terms relating to (1) textile machinery and mill accessories, and (2) types of fabrics used in cotton, wool, silk, jute and man-made fibre industries. Besides, preliminary drafts were prepared on the following two subjects:

a) Definitions of textile terms relating to man-made fibres, and

b) Definitions of terms relating to various types of fabrics made from man-made fibres or filaments.

Work in Hand

Definitions of terms relating to textile machinery and mill accessories used in:
- cotton industry
- jute industry
- silk industry
- wool industry

Definitions of terms relating to types of fabrics used in:
- cotton industry
- jute industry
- silk industry
- wool industry

Definitions of textile terms relating to man-made fibres
Definitions of terms relating to various types of fabrics made from man-made fibres or filaments
Definitions of textile terms (*tentative*)
Determination of:
- crimp in wool in the fleece
- clean wool yield of raw wool
- kemp content of raw wool
- mean fibre length of wool
- threads per inch in woven woollen fabrics
- weight per square yard (or square metre) and weight per linear yard (or linear metre) of wool fabrics
- length and width of jute fabrics
- porter of jute and shots per inch of jute fabrics
- weight per square yard (or square metre) and weight per linear yard (or linear metre) of jute fabrics
- count (or melidity) of warp and weft yarns in grey fabrics
- tensile strength of cotton fibre (flat bundle method)
- breaking load (strength) and elongation of single threads of cotton yarn (by constant-rate-of-traverse machine)
- fibre immaturity percentage by polarizing microscope
- regularity and evenness of yarn
- nappiness in cotton

ii) *Chemical Test Methods* — Fifteen Indian Standards on methods for determination of colour fastness of textile materials were published or were in press during the period under review. Besides, the Indian Standards for methods for estimation of small quantities of copper, iron, manganese, chromium and zinc in proofed cotton fabrics was sent for printing. Draft Indian Standard Methods for the Estimation of Moisture, Total Size or Finish, Ash and Fatty Matter in Grey and Finished Cotton Textile Materials (Revision of IS: 199-1950) was finalized for publication.

Draft Indian Standard Methods for:

a) detection and estimation of cellulosic textile materials due to micro-organisms,

b) determination of colour fastness of textile materials to daylight, and

c) determining the relative efficiency of wetting agents

were issued in general circulation for eliciting comments.

The other subjects which continued to receive consideration of the Committee are listed under the head ' Work in Hand '.

Publications

Method for Determination of Colour Fastness of Textile Materials to:
- IS: 968-1956 Acid Spotting
- IS: 969-1956 Cross-Dyeing Wool
- IS: 970-1956 Degumming
- IS: 971-1956 Perspiration
- IS: 972-1956 Potting
- IS: 973-1956 Soda Boiling
- IS: 974-1956 Steaming
- IS: 975-1956 Sublimation
- IS: 976-1956 Water Spotting
- IS: 977-1956 Alkali Spotting
- IS: 978-1956 Carbonizing with Sulphuric Acid
- IS: 979-1957 Mercerizing
- IS: 980-1957 Stoving
- IS: 981-1957 Acid Milling

IS: 1039-1956 Methods for Estimation of Small Quantities of Copper, Iron, Manganese, Chromium and Zinc in Proofed Cotton Fabrics

Work in Hand

Revision of IS: 19-1949 Procedure for Testing Cotton Textiles and Cordages (Other than Jute) for Resistance to Attack by Micro-Organisms
Revision of IS: 199-1950 Methods for Estimation of Moisture, Total Size of Finish, Ash and Fatty Matter in Grey and Finished Cotton Textile Materials
Revision of IS: 201-1950 Methods of Analysis of and Tolerances for Water for Textile Purposes
Detection and estimation of damage in cellulosic textiles due to micro-organisms
Method for determination of colour fastness of textile materials to daylight
Method for determining the relative efficiency of wetting agents
Method for determining the relaxation and felting shrinkage of knitted woollen garments
Method for determination of shrinkage on washing of woven rayon and synthetic fibre fabrics not liable to felting
Methods for identification of cellulosic derivatives of synthetic resin finishes on cotton and regenerated cellulosic fibres
Determination of strength of anthraquinone vat blue RSN, anthraquinone vat blue BC and anthraquinone vat green B
Determination of strength of caledon blue XRC, caledon blue XRN and caledon jade green 2G
Procedures for testing jute fabrics for resistance to attack by micro-organisms
Quantitative estimation of fibres and their mixtures
Determination of scouring loss
Determination of absorbency of cotton textile materials
Detection and estimation of common antiseptics in cotton textiles
Detection and estimation of damage in cellulosic textiles by heat and mechanical agencies
Detection and estimation of damage in cellulosic textiles by chemical agencies
Method for determination of colour fastness of textile materials to:
- carbonizing with aluminium chloride
- alkaline milling
- washing at the boil
- decatizing
- chlorinated water
- bleaching with sodium chlorite
- washing in presence of sodium hypochlorite gas fumes

Methods for identification of waterproof, mildewproof, rotproof and fireproof finishes on textiles
Methods for assessing relative efficiency of detergents
Method for measuring leakage of water under constant hydrostatic pressure
Resistance of fabrics and yarns to insect pests

iii) *Cotton Yarn and Fabrics* — A draft standard for filter cloth, grey, for sugar and oil industries was finalized for publication. Three draft standards on cotton fabrics for defence services were issued in general circulation.

Work in Hand

Revision of IS: 293-1951 Code for Seaworthy Packaging of Cotton Textiles
Filter cloth, grey, for sugar and oil industries
Cotton cambric, scoured
Cotton mosquito netting, square mesh, dyed
Cotton cellular shirting, dyed

iv) *Textile Materials for Aircraft* — Indian Standard Specification for Fabric for Covering Plywood in Aircraft was sent for printing. Draft specifications for (1) braided cotton cord for aircraft, and (2) cotton sewing threads for aircraft reached advanced stage of preparation.

Publication

IS: 1047-1957 Cotton Fabric for Covering Plywood in Aircraft

Work in Hand

Braided cotton cord for aircraft
Cotton sewing thread for aircraft
Cotton webbing for aircraft safety belts
Flax webbing for aircraft purposes
Jute webbing
Tape cotton
Tape silk
Thread silk
Thread linen
Cord elastic

v) *Jute and Jute Fabrics* — Much headway could not be made in this field as the Jute Sectional Committee, TDC 3, and its four subcommittees were in the process of reconstitution. The work of formulation of a standard for jute bags for packing sugar assigned to TDC 28 was taken in hand.

Work in Hand

Indian hessians
Packing jute manufactures in bales, trusses and bundles
Jute bags for packing sugar

vi) *Woollen and Worsted Fabrics* — The Wool Sectional Committee, TDC 4, deferred preparation of draft specifications for bazar quality woollen and worsted fabrics. The formulation of standards on hand-woven woollen carpets (South India) for export and on handloom woollen carpets and rugs (such as made in Rajasthan, Agra, Gwalior, etc) for export was considered by TDC 4, and the Committee decided to refer them back to the panels concerned for the purpose of introducing labelling scheme for the benefit of the ultimate consumer.

Work in Hand

Worsted lohis
Super shawls
Woollen rugs
Woollen blankets
Worsted suitings (top dyed)
Worsted suitings (piece dyed)
Worsted suitings (special)
Summer suitings
Union suitings
Tweed
Blazer cloth
Woollen coating
Woollen flannel for trousering
Worsted shirting
Woollen carpets and woollen rugs (floor coverings) such as are made in Rajasthan, Agra, Gwalior, etc, for export
Hand-woven woollen carpets (South India) for export
Cloth, green, baize
Felt, sheets ordinary for packing and cushioning
Felt, brown, half inch
Serge, battle dress 56 inch
Blankets barrack/hospital brown
Serge blue No. 1, 56 inch
Cloth blanket 54 inch (for follower's coats)

vii) *Handloom Fabrics (Cotton and Woollen)* — Handloom Cloth Sectional Committee, TDC 13, met twice during the year in joint sessions with its subcommittees and panels. Ten Indian Standards on handloom cotton fabrics and eight Indian Standards on

handloom woollen fabrics were published during the year. Ten draft specifications on cotton handloom fabrics were finalized for publication. In addition to these eight draft specifications on cotton handloom fabrics, four on woollen handloom fabrics were approved for general circulation for eliciting comments. TDC 13 also decided during the year to take up the work of formulation of standards on handloom silk and rayon fabrics and assigned that work to a new Handloom Silk and Rayon Cloth Subcommittee, TDC 13 : 3. In pursuance of the decision taken by the Panel for Handloom Yarn (TDC 13: 1: 2), samples of various counts of yarns used by the Madras State Handloom Weavers' Co-operative Society Ltd., were collected and tested for count and count-strength-product at the Technological Laboratory, Indian Central Cotton Committee, Bombay.

Publications

IS: 750-1956 Handloom Cotton Lungies, Striped or Checked
IS: 889-1957 Worsted Bunting Cloth, Heavy
IS: 890-1957 Worsted Bunting Cloth, Light
IS: 891-1957 Worsted Shirting
IS: 892-1957 Woollen Blankets, Natural Grey
IS: 893-1957 Woollen Blankets, Ordinary, Plain or Check
IS: 894-1957 Woollen Blankets, Superior, Scarlet (Red)
IS: 895-1957 Woollen Blanketing Cloth
IS: 896-1957 Woollen Kamblies Loomstate

Work in Hand

Handloom cotton:
- Madras handkerchiefs
- gada cloth, grey
- dress material, bleached, dyed, printed, striped or checked
- Holland cloth
- mosquito netting, bleached or dyed
- cambric, bleached
- lining cloth, dyed
- crepe, bleached or dyed
- cellular shirting, bleached or dyed
- buckram cloth
- floor durries
- Madras check
- nainsook, bleached or dyed
- calico, bleached
- shirting, bleached, dyed, striped, checked or printed
- coating, bleached, dyed, striped or checked
- long cloth, bleached or dyed
- pyjama cloth, grey and striped
- curtain cloth, bleached, dyed, striped, checked or printed
- handloom bed durries
- handloom woollen tweed
- handloom serge
- handloom worsted raffal shawls
- handloom worsted lohis

viii) *Coir and Coir Products* — Indian Standard for coir fibre was sent to the press for printing during the year. Replicas of the boxed coir fibre colour standards prepared by the Cochin Chamber of Commerce were approved by the Coir and Coir Products Sectional Committee, TDC 9. The boxed coir fibre colour standards containing nine specimens of fibres have been kept in the custody of the Coir Board, Ernakulam. Replicas have also been kept with the Indian Standards Institution; the Travancore Coir Mats and Matting Manufacturers Association, Alleppey; and the Cochin Chamber of Commerce, Kozhikode.

Publication

IS: 898-1957 Coir Fibre (*Tentative*)

Work in Hand

Three grades of anjingo type of yarn
Coir mats
Coir matting

ix) *Rayon Yarn and Fabric* — Four draft standards on methods of test for continuous filament rayon yarn and estron yarn reached advanced stage of finalization. The work of formulation of specifications for fifteen types of rayon fabrics progressed further.

Work in Hand

Method for determination of denier (or yarn melidity in tex), twist, dry and wet single strand strength and elongation of continuous filament rayon yarn and estron yarn
Method for determination of commercial weight of continuous filament rayon yarn and estron yarn and their mixture
Rayon fabrics: taffeta, crepe, satin, half-crepe, shioze, georgette, voile, ninon, chiffon, linen, jacquards, filament-staple mixtures, staple fibre fabrics, shark-skin and baby-sharkskin
Method for grading continuous filament rayon yarn and estron yarn

x) *Ropes and Cordages* — Draft specifications for hawser-laid manila rope, shroud-laid manila rope and cable-laid manila rope were finalized for publication.

xi) *Textile Sizing and Finishing Materials* — The Indian Standard Specification for Tamarind Kernel Powder for Use in the Cotton Textile Industry (*Revised*) was published during the year. The draft specification for maize starch for use in the cotton textile industry was revised. The Textile Sizing and Finishing Materials Sectional Committee, TDC 12, decided to investigate the need for taking up work of formulation of standard specification for tapioca starch for use in the textile industry. The investigation was in progress.

Publication

IS: 189-1956 Tamarind Kernel Powder for Use in the Cotton Textile Industry (*Revised*)

Work in Hand

Maize starch for use in the cotton textile industry

xii) *Hosiery Yarn and Knitted Garments* — The Regional Subcommittees of the Cotton Hosiery and Knitted Garments Sectional Committee, TDC 15, one each for eastern, southern, northern and western regions of the country were engaged in the collection of data as regards weight, fabric structure, dimensions, sizes, etc, of various types and sizes of plain knit underwear more commonly made in the respective regions with a view to making provision for regulating size marking. The Woollen Hosiery and Knitted Garments Sectional Committee, TDC 16, held its first meeting on 25 April 1956, and set up a subcommittee to take up the work of formulation of standards for socks, jerseys, pullovers, knitted gloves, woollen vests, etc.

Work in Hand

Cotton
- plain knit underwear
- interlock underwear
- interlock outerwear

Woollen
- socks
- jerseys

Woollen — *Contd*
gloves knitted
vests woollen
drawers
comforters
stockings
hose tops
cardigans
mufflers
slip-overs
pullovers
gents and ladies garments
scarves
jerseys, natural grey

xiii) *Textile Mill Stores* — Three Indian Standards for jute mill accessories were published during the year and one was under print. The draft standards for cotton mill bobbins; ring rabbeth bobbins for cotton mills; picking sticks for cotton looms; shuttles for hessian looms, sacking looms, plain calico and automatic looms; picking bands for looms; buffers; buffer bands for automatic looms; cotton healds and reeds used in cotton mills advanced to a further stage of preparation. The draft standards for jute shuttles and twin wire healds were approved for general circulation.

Publications

IS: 1041-1957 Box Back Blanks for Jute Looms
IS: 1042-1957 Boards for Lay Races of Jute Looms
IS: 1043-1957 Blanks for Lay Blocks for Jute Looms
IS: 1048-1957 Built Bobbins for Old-Type Dry Jute Spinning Frames

Work in Hand

Six inch lift varnished and enamelled ring rabbeth bobbins for cotton mills
Shuttles for hessian looms
Shuttles for sacking looms
Shuttles for automatic looms
Leather picking bands for looms
Twin wire healds for use in cotton and silk weaving (excluding jacquard and fancy weaving)
Picking sticks for cotton looms
Shuttles for plain calico looms
Buffers
Pickers
Buffer bands for automatic looms
Cotton healds used in cotton mills
Wire reeds used in cotton mills
Cotton healds used in jute mills
Wire reeds used in jute mills
Fluted rollers
Spindles
Spindle tapes
Tubular banding to drive spindles (for cotton textile mills)

xiv) *Textile Machinery* — The Cotton Weaving Machinery Components Sectional Committee, TDC 29, and Cotton Spinning Machinery Components Sectional Committee, TDC 30, held their first meetings on 8 and 9 November 1956, respectively. The TDC 29 set up a Subcommittee for Plain Calico Looms and Their Components, and assigned to it the work of formulation of standards for loom dimensions, fly spindles and picking noses. The second committee set up two subcommittees one to deal with ring frames and their replacement parts and the other to deal with cards and their replacement parts.

Work in Hand

Loom dimensions
Fly spindles
Picking noses
Ring frames
Carding engines

2.4 Chemical Division — The Chemical Division Council (CDC) held its ninth meeting on 14 March 1957 under the chairmanship of Dr. A. Nagaraja Rao. In his opening address the chairman referred to the impending retirement of Dr. K. L. Moudgill, Deputy Director (Chemicals) on 12 April 1957. He proposed and the council adopted a resolution in appreciation of the services rendered by Dr. Moudgill during the tenure of his office and wished him a peaceful and long life of well-earned retirement. The chairman also welcomed Dr. Sadgopal who had joined the ISI as Dr. Moudgill's successor.

2.4.1 The Council elected Dr. M. B. Ichaporia of Tata Oil Mills Co. Ltd., as a representative of the CDC on the General Council of the ISI for a period of three years ending 31 December 1959 in the vacancy caused by the retirement of Dr. R. P. Mitra.

2.4.2 The Standing Working Committee of the Chemical Division Council (SWCC) held its fourteenth meeting on 31 August 1956 under the chairmanship of Col N. N. Chopra as Dr. Nagaraja Rao could not attend the meeting.

During the year, three new sectional committees were set up to deal with test methods for water analysis and the mode of reporting the results thereof, ceramicware and metal containers. The last named was set up on a proposal from the Standing Metric Committee of the Government of India that the ISI should take up the formulation of Indian Standards for containers on the basis of the metric sizes for paints, chemicals, oils, etc. The CDC also reorganized its existing sectional committees on heavy chemicals (organic and inorganic) as indicated below:

Old Designation of Sectional Committee	New Designation of Sectional Committee
CDC 2 *Heavy Chemicals (Organic)* dealing with alcohol, wood distillation products, acetic acid, ether, perfumery grade alcohol, coal tar disinfectants and coal tar products.	*CDC* 2 *Alcohol and Allied Products* to deal with alcohol, acetic acid, ether and perfumery grade alcohol.
	CDC 23 *Coal Carbonization Products* to deal with coal tar disinfectants, coal tar distillates and dye intermediates.
CDC 3 *Heavy Chemicals (Inorganic)* dealing with heavy chemicals (sulphates), heavy chemicals (misc), industrial gases, drums for packing chemicals, charcoal (for industrial purposes), acids, fertilizers and allied products, alkali and allied products and salt and marine products.	*CDC* 3 *Heavy Chemicals (Misc)* to deal with sulphates, industrial gases, drums for chemicals, charcoal (for industrial purposes) and other miscellaneous chemicals.
	CDC 24 *Acids and Fertilizers* to deal with mineral acids, nitrogenous fertilizers, phosphatic fertilizers and mixed fertilizers, potassic fertilizers and other allied products.
	CDC 25 *Alkalis and Chlorine* to deal with alkalis, chlorine and its products, common salt and marine products.

The CDC accepted during the year under review 119 new subjects for formulation of standard specifications. These included salt for animal consumption, mixed fertilizers, drums for chemicals, base

paper for sensitized paper manufacture, waterproof packing paper, chrome retan leather, tanned reptile skins, cycle saddle leather, lime for various industries, glossary of paint terms, metal polishes, boot polishes, enamelware, potteryware and stoneware (other than sanitaryware).

The CDC gave special attention to the industries which were protected by the Government of India on the recommendations of the Tariff Commission and published Indian Standards on calcium carbide, and methods of sampling and test for phenolic moulding materials, Part I. The other items falling under this category, namely sheet glass, plastic raw materials and finished products were given priority.

2.4.3 The record of work done under the Division Council during the year is summarized in the following figures:

No. of meetings of sectional committees and subcommittees	77
New standards published and in press	41
Standards revised	4
Amendments to standards	12
Draft standards finalized	28
Draft standards widely circulated	33
Draft standards compiled	72
Draft standards under preparation	55

2.4.4 The work of the Division during the year covered the following fields:

i) Comparative Study of Indicators, Reagents, Apparatus, Test Procedures, etc, prescribed in Indian Standards
ii) Heavy Chemicals
iii) Fine Chemicals
iv) Rubber Products
v) Paints
vi) Lac
vii) Glassware
viii) Essential Oils
ix) Inks
x) Coal and Coke
xi) Paper
xii) Leather and Leather Goods
xiii) Plastics
xiv) Classification and Labelling of Dangerous Substances
xv) Petroleum Products
xvi) Ceramicware
xvii) Lubricants
xviii) Treated Fabrics
xix) Oils, Fats and Soaps
xx) Metal Containers

2.4.5 A brief account of the work done under each of these fields is given below:

i) *Comparative Study of Indicators, Reagents, Apparatus, Test Procedures, etc, Prescribed in Indian Standards* — About 410 Indian Standards on chemical subjects have been published so far and the number of these standards is likely to increase to 600 by the end of the Second Five-Year Plan. With the progressive increase in the number of these standards the question of adopting uniform terminology, indicators, reagents, apparatus and test procedures is becoming more important. At present there are numerous variants specified in Indian Standars for as simple a matter as the preparation of ordinary desk reagents. It is not very convenient to stock all these variants of reagents in a testing laboratory. With a view to reducing their number to a minimum without adversly affecting the efficiency of test procedures, it has been arranged to collect actual extracts on each subject from the published standards. A comparative study of all these extracts will be made by the Chemical Standards Sectional Committee (CDC 1) for the purpose of advising other sectional committees. It is hoped that this work will prove useful to the various committees of the ISI and the chemical industry as a whole.

ii) *Heavy Chemicals* — In the field of organic chemicals, four Indian Standards were published and one Amendment to IS: 323-1952 Rectified Spirit, finalized. Among inorganic heavy chemicals, eleven standards were published and six other draft standards and draft amendments were finalized.

In certain formulations of coal tar disinfectant fluids, the conventional coal tar phenols and oils have been discarded in favour of certain halogenated aryl, alkyl phenol derivatives dissolved in kerosene. The manufacturers claim that the disinfectants so prepared give the requisite RW coefficient and, therefore, should be considered quite acceptable and effective. The indigenous manufacturers of such disinfectants, therefore, wanted that the title of the draft standard for coal tar disinfectants, black and white should be amended to ' Disinfectant Fluids, Black and White ' to cover such disinfectants as well, beside coal tar disinfectants. The Heavy Chemicals (Organic) Sectional Committee (CDC 2) through its Coal Tar Products Subcommittee (CDC 2: 8) considered the relative merits of various types of disinfectants from available literature and felt that it may not be advisable to cover all disinfectants in one specification and the draft Indian Standard Specification for Coal Tar Disinfectants, Black and White should cover only the conventional type with a minimum content of active ingredients derived from coal tar. This specification has been published.

The CDC 2 finalized an amendment to Indian Standard Specification for Rectified Spirit and decided to revise the Indian Standard Specification for Denatured Spirit.

The Alcohol Subcommittee (CDC 2:1) gave further consideration to the compilation of alcoholometric tables and recommended that:

a) direct volumetric system (Gay Lussac system) be adopted since the weight system was considered to be inconvenient from the customs point of view. Alcoholometric tables be drawn up for a temperature of 27°C;

b) the compilation of alcoholometric tables be entrusted to a highly competent technologist or scientist;

c) a reliable and competent manufacturer from abroad be entrusted with manufacture of prototype hydrometers; and

d) glass be used for the manufacture of prototype hydrometers.

The recommendations of CDC 2:1 and replies received from some of the manufacturers abroad were considered by CDC 2 and the Committee decided that the compilation of alcoholometric tables be entrusted to the National Physical Laboratory as a specific research item.

The ISO/TC 78 Aromatic Hydrocarbons, at its first meeting, at the instance of the Indian Delegate, Shri G. Gundu Rao, resolved that conversion tables for specific gravity of benzene and toluene from 15°/15°C to a higher temperature suitable for tropical use should be prepared, this work being undertaken by the secretariat (BSI) in collaboration with International Conference of Benzole Producers (ICBP). Owing to the difficulties in effecting an accurate determination in Western Europe of the specific gravity of benzene and toluene at temperatures below or above the temperature which is maintained in the laboratories (15° to 25°C), the Technical Committee of the ICBP decided not to take any action except if specially wanted by India. Samples of benzene and toluene were collected from the ICBP through the secretariat. The National Physical Laboratory (NPL) and Shri Ram Institute for Industrial Research (SRIIR) have undertaken this work. SRIIR have already sent the required data.

In pursuance of the recommendations of the Tariff Commission, an Indian Standard for Calcium Carbide was published as a tentative standard to be revised within three years. At the formulation stage the standard was critically discussed by the Sectional Committee concerned and ample consideration was shown to the indigenous product, keeping in view the limitations with regard to essential raw materials.

With the increase in the production of rayon in the country, the necessity of the formulation of Indian Standard on Caustic Soda required by the rayon industry, has become important. The Indian Standard Specification for Caustic Soda, Pure, has been printed after taking into consideration the analytical figures for caustic soda for rayon manufacture, produced indigenously and imported in the country.

In view of the importance of compounded fertilizers, priority was given to mixed fertilizers like sulphate-phosphate, sulphate-nitrate and nitro-chalk. Two drafts on china clay were widely circulated. The standard on china clay for textile and paper industries could not be finalized as the industries wanted more time for consideration.

Publications

IS: 307-1956 Carbon Dioxide, Industrial
IS: 309-1956 Compressed Oxygen Gas
IS: 853-1956 Bone-Meal, Raw
IS: 877-1956 Methods of Sampling and Test for Activated Carbon Used for Decolourizing Vegetable Oils and Sugar Solutions
IS: 1013-1956 Triple Superphosphate
IS: 1014-1956 Bone-Meal, Steamed
IS: 1021-1956 Caustic Soda, Pure
IS: 1022-1956 Kotka Phosphate
IS: 1023-1956 Dicalcium Phosphate
IS: 1040-1957 Calcium Carbide, Technical
IS: 1049-1957 Alcohol Perfumery Grade
IS: 1061-1957 Coal Tar Disinfectant Fluids, Black and White
IS: 1065-1957 Bleaching Powder, Stable

Work in Hand

Revision of IS: 324-1952 Denatured Spirit
Amendment No. 2 to IS: 252-1950 Caustic Soda, Technical
Amendment No. 1 to IS: 259-1950 Ammonia Alum, Technical
Amendment No. 1 to IS: 261-1950 Copper Sulphate, Technical
Amendment No. 1 to IS: 265-1950 Hydrochloric Acid
Amendment No. 1 to IS: 266-1950 Sulphuric Acid
Amendment No. 1 to IS: 294-1951 Superphosphate (*Tentative*)
Amendment No. 1 to IS: 323-1952 Rectified Spirit
Amendment No. 2 to IS: 323-1952 Rectified Spirit
Amendment No. 1 to IS: 574-1954 Glassy Sodium Metaphosphate, Technical
Amendment No. 1 to IS: 708-1956 Potassium Chlorate, Technical
Acetic anhydride
Coal tar solvent naphtha, light, grade 2
Oleum (20 percent), technical
Ammonium chloride, technical
Ammonium chloride, pure
Glossary of terms used in fertilizer trade and industry
Sampling and methods of test for quick lime and anhydrated lime
Quick lime and anhydrated lime for chemical industries
Quick lime and anhydrated lime for calcium carbide
Quick lime for sulphite pulp
Quick lime and hydrated lime for glass industry
Hydrated lime for grease
Common salt for animal consumption
Cattle licks (plain and mineralized)
China clay for paper and textile industries
Borax, technical
China clay for rubber industry
Compressed hydrogen

iii) *Fine Chemicals* — During the year, six Indian Standards were published. Indian Standard Specifications for Sodium Thiosulphate and Sodium Sulphite were issued as tentative standards in 1950. In the light of the progress made by these industries, it was decided to revise them, and draft revisions of these standards were issued.

The Indian Standard Specification for Sodium Bisulphite (*Tentative*) (IS: 248-1950) specifies that a solution of 20 g of sodium bisulphite in 100 ml of the solution shall be clear and free from suspended impurities. In terms of metabisulphite this corresponds to about 18·27 percent solution (*w/v*). This was considered too low, and it was suggested that the solubility be raised to at least 40 percent (*w/v*) solution. The argument put forward for this suggestion was that usually 40 percent solution was required by the dyestuff industry for various chemical reactions. The CDC 4, after careful consideration decided to request Atul Products Ltd. and Kesar Sugar Works to find out the various

impurities present in 40 percent solution of sodium bisulphite procured against IS: 248-1950 or manufactured in conformity with this standard, and the effect of these impurities on the yield and quality of the product obtained after reaction with this material.

The finalized draft standard for turkey red oil could not be published as the Committee felt that a limit for calcium soap dispersing power should be incorporated in the draft. Samples of indigenous turkey red oil were under test by Dr. N. F. Desai of the Department of Chemical Technology, University of Bombay. As soon as the test results were available, the Vegetable Tallow and Turkey Red Oil Subcommittee would meet and make their recommendations for the consideration of CDC 4.

Need for standardization of electroplating chemicals has been long felt. A new subcommittee (CDC 4: 8) has, therefore, been set up to take up this work.

Publications

IS: 869-1956 Ethylene Dichloride, Technical
IS: 879-1956 Sodium Nitrite, Technical
IS: 880-1956 Tartaric Acid
IS: 1069-1957 Water for Storage Batteries
IS: 1070-1957 Distilled Water
IS: 1078-1957 Copper Naphthenate
Amendment No. 1 to IS: 245-1950 Trichloroethylene
Amendment No. 1 to IS: 330-1951 Chromic Acid

Work in Hand

Revision of IS: 246-1950 Sodium Thiosulphate
Revision of IS: 247-1950 Sodium Sulphite
Amendment No. 1 to IS: 557-1954 Sodium Acetate, Technical and Photographic
Precipitated calcium carbonate, grade 1 and grade 2
Activated calcium carbonate
Dicalcium phosphate
Tricalcium phosphate
Turkey red oil
Vegetable tallow

iv) *Rubber Products* — The Rubber Products Sectional Committee, CDC 6, changed the title of the draft specification for rubber lined cotton jacketed hose for general fire fighting service to ' rubber lined woven jacketed hose for general fire fighting service' to cover either cotton or flax as suitable material for the jacket. This specification, however, could not be published during the year due to differences of opinion regarding the sizes to be covered. It is hoped that this stalemate would be resolved at the next meeting. Besides this specification, four drafts on braided hoses were under wide circulation.

Samples of natural red oxide of iron, barytes and whiting were being analysed at the laboratories of Dunlop Rubber Co. (India) Ltd., Bata Shoe Company (Private) Ltd., and Technical Development Establishment, Textile and Clothing, Kanpur. Drafts on these three subjects would be modified on the basis of these test results and circulated to all interests for comments.

The CDC 6 set up a new subcommittee to take up the work on automotive and aircraft rubber parts.

India was an ' Observer ' member of ISO/TC 45 Rubber, but the CDC 6 felt that in view of the expansion of rubber industry in the country, India should participate more actively in the work of ISO/TC 45 and become a ' Participating ' member.

Work in Hand

Rubber conveyor and elevator belting
Rubber lined woven jacketed hose for general fire fighting service
Water suction hose
Braided air hose, heavy duty
Braided hose, low pressure
Braided water hose, high pressure
Braided air hose, light duty
Unlined flax water hose
Armoured suction hose for fire fighting services
Delivery hose, flax or cotton burnettized
Latex foam rubber
Ebonite
Whiting for rubber industry
Red iron oxide for rubber industry
Barytes for rubber industry
Titanium dioxide, anatase type
Zinc oxide red seal
Yellow iron oxide

v) *Paints* — During the year, four specifications on ready mixed paints and one on kegs (open top drums) for paints were published. The specifications on ready mixed paints covered the special requirements of railway coaches and hessian backing.

It is gratifying to report that the whole series of the DGS&D specifications on paints and allied materials (G/P 307/1-276) has almost been covered by Indian Standards.

A draft standard glossary of terms relating to paints has been compiled to facilitate the interpretation of the terms prescribed in individual paints standards and would be issued to interests concerned for comments.

With a view to suggesting composition of paints and varnishes suitable for tropical climate a new subcommittee on surface coatings has been set up. This subcommittee would confine itself to the study of corrosive and surface treatment with special reference to protective coatings consisting of primers and finishing coats. In addition, this subcommittee is expected to correlate the results of exposure tests in weatherometer with out-door exposure performances.

Publications

IS: 618-1956 Kegs (Open Top Drums) for Paints
IS: 640-1956 Ready Mixed Red Oxide Paint for Hessian (Colour Unspecified)
IS: 870-1956 Ready Mixed Paints, Brushing, Finishing, Egg Shell Gloss, for Interior Use, to Indian Standard Colours
No. 101 Sky Blue, No. 219 Sage Green
No. 216 Eau-De-Nil, No. 275 Opaline Green
No. 217 Sea Green, No. 281 Apple Green
IS: 871-1956 Ready Mixed Paint, Brushing, Finishing, Egg Shell Gloss, for Interior Use, to Indian Standard Colours
No. 218 Grass Green, No. 221 Brilliant Green
IS: 872-1956 Ready Mixed Paint, Brushing, Finishing, Egg Shell Gloss, for Interior Use, to Indian Standard Colours
No. 412 Dark Brown, No. 413 Nut Brown

Work in Hand

Amendment No. 1 to IS: 57-1950 Red Lead for Paints and Jointing Purposes
Amendment No. 1 to IS: 101-1950 Methods of Test for Ready Mixed Paints and Enamels

Amendment No. 1 to IS: 350-1952 Insulating Oil Varnish, Clear, Baking
Amendment No. 1 to IS: 351-1952 Insulating Varnish, Baking, Bitumen Type
Amendment No. 1 to IS: 352-1952 Insulating Spirit Varnish, Clear, Air-Drying
Amendment No. 1 to IS: 353-1952 Insulating Varnish, Non-Alcoholic, Clear, Air-Drying
Amendment No. 1 to IS: 384-1954 Brushes, Paints and Varnishes, Flat
Amendment No. 1 to IS: 486-1954 Brushes, Paints and Varnishes, Sash Tool
Amendment No. 1 to IS: 487-1954 Brushes, Paints and Varnishes, (i) Oval, Ferrule Bound, (ii) Round, Copper Wire Bound
Brushes lettering
Brushes artists
Cellulose nitrate ester soluble, for use in the manufacture of clear and pigmented lacquers
Glossary of terms relating to paints
Black Japan, type B
Black Japan, type C (for hot surfaces)
Anti-corrosive paint, brushing, for ship's bottom
Boot-topping, anti-corrosive red and anti-fouling black paints, brushing for ship's hulls
Oil paste for paints, yellow ochre
Ready mixed paint, brushing, oil gloss, genuine zinc oxide, for general purposes
Ready mixed paint, brushing, yellow ochre, oil gloss for general purposes
Ready mixed paint, brushing, oil gloss, heat resisting to Indian Standard Colour No. 360 Deep Buff
Synthetic enamel thinner

vi) *Lac*—Activities in the international sphere in this field are reported under 3.2.22. Three revised Indian Standards on seedlac, shellac and bleached lac were published. These standards were based on the draft ISO recommendations on these subjects. It is expected that these revised standards would help in smoothening India's export trade in lac, more so, because importing countries would base their national standards on draft ISO recommendations. An Indian Standard for sealing wax was also published during the year.

Publications

IS: 15-1956 Seedlac (*Revised*)
IS: 16-1956 Shellac (*Revised*)
IS: 17-1956 Bleached Lac (*Revised*)
IS: 868-1956 Sealing Wax

Work in Hand

Sealing wax for railway wagons

vii) *Glassware* — An Indian Standard for graduated measuring cylinders was published but the finalized draft Indian Standard for limestone for glass industry could not be issued because of certain comments from the Technical Development Establishment, Laboratories, Kanpur. This draft was reconsidered by the Glassware Sectional Committee (CDC 10) at its sixth meeting and was expected to be published shortly after incorporating modifications suggested by the Committee. Besides, at this meeting eight more drafts were finalized.

A proposed draft on sheet glass was considered by the Sheet Glass Subcommittee at its meeting held on 2 February 1957. The Subcommittee decided to cover at present only one grade suitable for glazing and framing purposes and to take up other grades later as production and demand increased. The Subcommittee, with the assistance of the Central Glass and Ceramic Research Institute (CGCRI), Seraikella Glass Works and Hindustan Pilkington Glass Works, was investigating the desirability of incorporating durability, breaking strength and thermal shock tests in the draft. The draft, when ready, would be circulated to all interests concerned for comments.

Importance of standardization of quality, shape and size of glass containers for fruit preservative industry was stressed at the sixth meeting of CDC 10 by Shri S. S. Mehta, Technical Director, Tariff Commission. A symposium was also held in the CGCRI on 10 January 1957 in which glass manufacturers, fruit and vegetable preservers, scientists, technologists and representatives of connected Government Departments were invited. As a result of discussion in this Symposium an ' Action Committee ' has been formed by the CGCRI to pursue the progress of work on formulation of standards and improvement in the quality of glass containers for the fruit preservative industry. The recommendations of the Action Committee would be placed before CDC 10 for further action.

The ISI Directorate collected technical data on penicillin bottles from various organizations, such as Hindustan Antibiotics, Sarabhai Chemicals, Dholpur Glass Works, Glaxo Laboratories and Alembic Pharmaceuticals. On the basis of this information the Ampoules Subcommittee is to draw up the proposed draft standard on penicillin bottles.

Publications

IS: 878-1956 Graduated Measuring Cylinders
Amendment No. 1 to IS: 488-1953 Glass Making Sands (*Tentative*)

Work in Hand

Sheet glass
Glass globe and chimney
Distilled water glass bottles
Aerated water glass bottles
Tincture glass bottles
Glass shells for general lighting service lamps
One mark graduated flasks
Glass filter funnels
One mark pipettes
Filter flasks
Boiling flasks (narrow necked)
Distilling flasks
Separating funnels
Reagent bottles
Beakers
Signal glass and signal colours
Lime stone for glass industry

viii) *Essential Oils* — In view of the publication of The Indian Pharmacopoeia (1955) (IP), the Indian Standard on eucalyptus oil was revised so as to bring it in line with the requirements prescribed in IP Standard. Data was being collected for drafting a Standard on orange oil.

Work in Hand

Revision of IS: 328-1957 Oil of Eucalyptus
Amendment No. 1 to IS: 327-1952 Lemongrass Oil (East Indian Lemongrass Oil)
Amendment No. 1 to IS: 512-1954 Citronella Oil
Vetiver oil
Linaloe oil

ix) *Inks* — The Committee concerned launched a programme of formulation of standards for duplicating and stencilling inks. Duplicating inks are in great demand for

office and other work. Indian units have also started production of this material. It has, therefore, become necessary to lay down standards for the materials. Similarly, the production of fountain pen inks has increased tremendously in volume and variety. Therefore, a revision of the specification for fountain pen inks, blue-black and red has been undertaken to include royal blue, brown and similar other inks; while another draft standard has been prepared for dye-based fountain pen inks.

Publications

Amendment No. 1 to IS: 219-1950 Ink Powders and Tablets, Blue-Black and Red
Amendment No. 1 to IS: 220-1950 Fountain Pen Inks, Blue-Black and Red
Amendment No. 1 to IS: 221-1950 Fluid Ink for Registration and for Cheques and Records
Amendment No. 1 to IS: 222-1950 Blue-Black Superior Fluid Ink for Writing

Work in Hand

Revision of IS: 220-1950 Fountain Pen Inks, Blue-Black and Red
Coloured fountain pen inks (blue, green, violet and red)
Ink duplicating, all weather black
Ink stencil, for marking porous surfaces, colour as required
Ink stencil, for marking nonporous surfaces, colour as required

x) *Coal and Coke* — The Indian Standard General Classification of Coal (IS: 770-1955) was published. The tentative Standard Specification for Size Grading of Coal and Coke for Marketing issued in 1953 was revised and made a firm standard. In this revision the term ' Rubble ' has been replaced by the new term ' Nuts (Rubble)', because although the term ' Rubble ' used in the 1953 edition was well understood in the coal trade in India, it was not so well understood in other countries. Its use was, therefore, likely to have adverse effect on the trade. Besides, six draft Indian Standards dealing with various methods of test for coal and coke were prepared on the basis of the methods under consideration by the Technical Committee on Solid Mineral Fuels of the International Organization for Standardization (ISO/TC 27). These draft standards will be circulated shortly to all interests concerned for comments.

Publications

IS: 437-1956 Size Grading of Coal and Coke for Marketing (*Revised*)
Amendment No. 1 to IS: 436-1953 Methods for Sampling of Coal and Coke (*Tentative*)

Work in Hand

Methods of Test for Coal and Coke — proximate analysis; moisture, volatile matter, ash, fixed carbon, total sulphur, calorific value
Methods of Test for Coal and Coke — ultimate analysis; carbon, hydrogen and nitrogen
Methods of Test for Coal and Coke — special impurities; phosphorus, chlorine, carbonate CO_2, forms of sulphur, arsenic
Methods of Test for Coal for Carbonization — caking index, swelling properties, gray-king assay, (LT) coke types
Methods of Test of Coke — special tests; shatter, micum, haven, bulk density, true specific gravity, apparent specific gravity, porosity
Methods of Test of Ash of Coal and Coke — analysis, fusibility, conversion to mineral matter

xi) *Paper* — The growing demand and production of paper and its allied products require special attention in the field of standardization. A long awaited standard for the Sampling and Methods of Test for Paper and Allied Products, Part I has been published. The Committee concerned was engaged in preparing Part II of this standard comprising special tests for paper. Another important achievement of this Committee is the finalization of a specification for paper sizes based on metric measurements. This standard would go a long way in helping the industry and the consumers in adopting the metric system.

A draft Indian Standard for paper for use in electrical apparatus has been compiled.

Publications

IS: 1060 (Part I)-1957 Methods of Sampling and Test for Paper and Allied Products, Part I
IS: 1064-1957 Paper Sizes

Work in Hand

Blotting paper
Waterproof packing paper (bituminous type)
Paper for use in electrical apparatus

xii) *Leather and Leather Goods*—Five standards were published. A draft Indian Standard for glossary of terms relating to hides, skin and leather was compiled for wide circulation. This standard would help in interpreting leather terms correctly and without ambiguity. Besides, the Committee concerned was arranging for the testing of samples of cycle saddle leather, chrome retan leather, and reptile skins with a view to evolving national standards.

Efforts were continued to impress upon the East India Tanned Leather trade and industry the benefits of standardization specially in the export trade.

The subject of boot polishes was also under consideration of the Committee.

Publications

IS: 575-1956 Chrome Belt Lace Leather
IS: 622-1956 Russet Leather
IS: 1015-1956 Leather Pump Buckets Made from Vegetable Tanned Leather
IS: 1016-1956 Methods of Sampling and Test for Oil Tanned Leathers
IS: 1017-1957 Chamois Leather

Work in Hand

Amendment No. 1 to IS: 583-1954 Ammunition Boots for General Purposes
Amendment No. 1 to IS: 584-1954 Chaplis, Frontier Pattern, for General Purposes
Vegetable tanned leather belting
Leather belting for sewing machines
East India tanned leather
Leather pump buckets made from chrome tanned leather
Glossary of terms relating to hides, skin and leather

xiii) *Plastics* — Two Indian Standards including one on Methods of Sampling and Test for Phenolic Moulding Materials, Part I, were published. On the basis of the results of investigations carried out on phenolic moulding powders at the Department of Chemical Technology, Bombay, the Committee concerned prepared Part II of the above draft specification, while it was intended to take up further testing of

improved varieties of phenolic moulding powders.

Plastic buttons of various types are now produced on a large scale in the country, and the industry, like PF moulding powders industry, is tariff protected. Draft standards for plastic buttons made from thermosetting materials were ready for circulation. Work was also undertaken for formulation of standards for laminates, PVC sheeting, polyethylene, polystyrene and other materials. Seven new subjects including polyethylene containers, plastic bottle closures were accepted for formulation of national standards.

Publications

IS: 840-1956 Cashewnut Shell Liquid (CNSL)
IS: 867(Part I)-1956 Methods of Sampling and Test for Phenolic Moulding Materials, Part I

Work in Hand

Methods of sampling and test for phenolic moulding materials, Part II
Phenol-formaldehyde moulding powder
Cellulose nitrate for leather cloth
Paper and fabric laminates
Methods of test for plastic buttons
Plastic buttons

xiv) *Classification and Labelling of Dangerous Substances* — The original draft for a code of practice for classification and labelling of dangerous substances was considered by the Sectional Committee concerned and modified to include symbols only in the draft standard. Four of the five symbols as suggested by International Labour Office were provisionally accepted by the Committee. With regard to the symbol for corrosion, there were divergent views between ILO and UNO Committees. Meetings of the ILO and UNO Committees were held in August 1956 and their recommendations would be considered at the next meeting of the ISI Sectional Committee.

Work in Hand

Code of symbols for labelling of dangerous goods
Classification of dangerous substances

xv) *Petroleum Products* — The Petroleum Products Sectional Committee approved for circulation more than thirty draft standards on methods of test for petroleum, fuels and solvents, which are to be issued into circulation in convenient batches of five so as to facilitate comments. Work on drafting standards for diesel fuels and kerosene was well in hand.

The agreement on methods of test for petroleum fuels and solvents is a specially important achievement, as the work of formulating specifications for the numerous petroleum products would now be facilitated. This assumes a special significance against the background of the intensive search now being carried out in the country for oil sources and the large scale increasing use of petroleum products in transport and industry.

Another important aspect, namely measurement of volume and other characteristics of petroleum products which are important from excise and contracts point of view, was being actively investigated during the year. It is hoped that, when agreement is reached on the many points arising in this work, it would prove of considerable help to the Government, industry and the consumers.

Work in Hand

Methods of Test for Petroleum Fuels and Solvents:
aniline point and mixed aniline point
aromatic and olefinic contents
ash and water soluble ash
burning quality and wick-char
carbon residue
colour
copper strip corrosion
diesel index
distillation
flash point — closed
freezing point
existent gum
hard asphalt
heat of combustion
kauri — butanol number
mineral or strong acidity
neutralization number
octane number
oxidation stability
pour point and cloud point
sampling
sediment
smoke point
specific gravity
sulphur
tel content
vapour pressure, reid
viscosity
water and sediment by centrifuge
water by distillation
water tolerance
cetane number
Kerosenes
Light diesel and high speed diesel oils

xvi) *Ceramicware* — In view of the growing importance of pottery and pottery products in the country, especially in the Second Five Year Plan, and with a view to centralizing the work which was entrusted to different committees, a new Sectional Committee on Ceramicware (CDC 27) was set up by the Chemical Division Council. The Technical Development Establishment, Stores, Kanpur, proposed about fifty items on Ceramicware for formulation of Indian Standards. The Committee would hold its first meeting on 22 April 1957 to draw up its programme of work.

xvii) *Lubricants* — During the year one Indian Standard was published and three draft Indian Standards, namely covering white oil, clock and watch oil and soluble cutting oil were finalized for adoption as Indian Standards.

During discussion on draft standard on White Oil, Shri J. M. Guha of the Petroleum Division of the Union Ministry of Works, Housing and Supply, suggested that test for readily carbonizable substances should be prescribed in this standard. In view of divergent views expressed by members, the Committee decided to refer the matter to the Directorate General of Health Services. The Committee felt that further tests on clock and watch oil should be carried out at the Technical Development Establishment, Laboratories, Kanpur, and, if necessary, the specification for clock and watch oil should be modified in

due course on the basis of these test results. For this purpose the Committee desired that the Swiss Horological Society be approached for samples of clock and watch oil approved by the Society and copies of specifications on these oils currently used in Switzerland should be obtained.

No serious trouble had been experienced with superheat cylinder oils complying with the requirements prescribed in the old ISD Specification on cylinder oils and IS : 313-1951 and IS : 314-1951 until the WP/WG locomotives operating at steam temperature of 325° to 370°C were put into commission on Indian Railways. Complaints on the WP/WG locomotives related to frequent replacement of piston valves, heavy carbon deposits, etc, which indicated unsatisfactory cylinder lubrication with these oils. The Railway authorities, therefore, suggested revision of IS : 313 and IS: 314 based on performance service trials on different Railways. The Lubricants Sectional Committee through its Steam Cylinder Oils Subcommittee considered a note prepared by the convener on this subject and decided to formulate separate specification on superheat steam cylinder oils for steam temperature of 370°C based on performance service trials on four Railways, namely Northern, Southern, Eastern and Western. It was decided that the oil firms would recommend cylinder oils which they considered would meet the operating requirements of high superheat temperatures and furnish data as far as possible on physical and chemical analysis and service performance in separate recommendations. It was also agreed that the oils already recommended for supply to the Railways for the purpose of trials should be considered when making out a fresh list. The Railway Testing and Research Centre, Lucknow, would then select 12 brands of oils from these for service trials on the four Railways taking from each firm not more than 2 oils for tests. Details of these trial schemes were being worked out by the Subcommittee.

Publication

IS: 1002-1956 Multipurpose Grease No. 1, No. 2 and No. 3

Work in Hand

Amendment No. 1 to IS: 317-1951 Automotive Hydraulic Brake Fluid
Amendment No. 1 to IS: 496-1955 Internal Combustion Engine Lubricating Oils
Amendment No. 1 to IS: 719-1955 Grease S/L No. 1
Gear lubricant, multipurpose (extreme pressure gear oil)
Gear lubricant, regular
Grease, S. No. 2
Corrosion preventive, exterior surface, transparent film and opaque film, cold application
Corrosion preventive, water displacing, cold application
Corrosion preventive, soft thick film, cold application, brushing type
Corrosion preventive, soft thin film, solvent deposited
Clock and watch oil
Soluble cutting oil
White oil, light, technical
Sulphurized cutting oil
Instrument oil
Cutting oil
Steam turbine oils

xviii) *Treated Fabrics* — The standard on fuel pump diaphragm fabric was published, while a draft on vinyl coated fabrics (leather cloth) was put into circulation. Data on cellulose nitrate proofed leatherite was being collected.

Publication

IS: 1001-1956 Fuel Pump Diaphragm Fabric (a) Synthetic Rubber Proofed, (b) Varnish Proofed

Work in Hand

Vinyl coated fabrics (leather cloth)
Cellulose nitrate proofed leatherite
Tarpaulin

xix) *Oils, Fats and Soaps* — The draft standard for methods of sampling and test for bleaching earths used for decolourizing vegetable oils was being got ready for sending to the press. In this standard, methods for determining decolourizing power, filterability and oil retention have been kept as tentative methods. It is hoped that final methods for determining these characteristics would be evolved in course of time as a result of further collaborative work, experience and committee investigations. In order to determine the repeatability and reproducibility of various test methods prescribed in this standard, the Bleaching Earths Subcommittee (CAFDC 5 : 3) has requested the Statistical Section of the ISI Directorate to examine statistically the test data collected by the Subcommittee and the data which would be made available as a result of collaborative work arranged between the DCM Chemical Works, Tata Oil Mills Co., Hindustan Lever Ltd., and Bombay-Sewree Chemicals Manufacturing Co.

The Bleaching Earths Subcommittee has also considered a proposal to formulate Indian Standard Specifications for Bleaching Earths. As a preliminary to evolving suitable standards on this subject, the Subcommittee has arranged laboratory investigations by the DCM Chemical Works, Hindustan Lever Ltd., and Bombay-Sewree Chemicals Manufacturing Co. (Private) Ltd.

Technical data collected on oleic and stearic acids was under consideration of the appropriate subcommittee for preparing specifications on these subjects.

Publications

Amendment No. 1 to IS: 284-1951 Specification for Toilet Soap
Amendment No. 1 to IS: 285-1951 Specification for Laundry Soap

Work in Hand

Methods of sampling and test for bleaching earths used for decolourizing vegetable oils
Stearic acid
Oleic acid

xx) *Metal Containers* — Acting on the suggestion of the Standing Metric Committee of the Government of India a Sectional Committee for formulating standards for metal containers was set up. The objective of this Committee is to prepare standards for metal containers keeping in view the fact that the metric system would shortly be introduced in India when a number of

products, which now reach the ultimate consumer in pound, gallon or seer system containers would be packed in kilogram and like containers. This is a fundamental change in outlook and the Committee at its first meeting would cover these aspects, keeping in view the need to prepare standards so as to be useful as early as possible.

2.5 Agricultural and Food Products Division — As the Agricultural and Food Products Division Council (AFDC) had been inaugurated on 18 February 1956, the year under report was actually the first year of the working of the Division Council.

The Division Council accepted 11 new proposals for the formulation of Indian Standards on BHC, refined; *gamma*-BHC (lindane); dieldrin and dieldrin, technical; dieldrin water dispersible powder concentrates; dieldrin emulsifiable concentrates; lime sulphur solution; nicotine sulphate solution; endrin, technical; endrin, technical; endrin water dispersible powder concentrates; endrin emulsifiable concentrates; and endrin dusting powders.

A new Sectional Committee to deal with the subject of animal feeds was also set up.

The first meeting of the Standing Working Committee of the AFDC took place with Shri M. S. Randhawa as chairman on 4 October 1956 at Delhi.

2.5.1 A record of the work done by the Division Council during the year is summarized in the following figures:

Number of meetings of sectional committees and subcommittees	27
New standards published and in press	17
Draft standards finalized	19
Draft standards widely circulated	22
Draft standards compiled	20
Draft standards under preparation	16

2.5.2 While the scope of the AFDC covers a variety of subjects in the field of food and agriculture (other than those covered by the Ministry of Food & Agriculture under the Agmark scheme), work was taken up specifically in the following fields:

i) Food Grain Storage, Seed Grain Storage and Layouts for Regulated Markets
ii) Sugar
iii) Glucose
iv) Edible Starches, Confectionery and Cereal Products
v) Apiary
vi) Dairy
vii) Tobacco Products
viii) Poultry and Animal Feeds
ix) Pest Control Products

2.5.3 A brief account of the work accomplished during the year under each of these fields is given below:

i) *Food Grain Storage, Seed Grain Storage and Layouts for Regulated Markets* — This work has been divided on regional basis. On the basis of agricultural produce and geographical conditions, India has been divided into five regions, namely northern, central, eastern, southern and coastal, and for each region there is a Regional Storage and Marketing Structures Sectional Committee. The work of these regional committees is co-ordinated through a Storage and Marketing Structures Co-ordinating Committee. While most of the assignments relating to food grain storage had been completed, work on seed grain and on the layouts for regulated markets was taken in hand and information collected from various sources. The experimentation on the aluminium grain storage bins which had been installed two years back at Cuttack, was continued and its relative efficacy for seed grain storage was also in study.

Work in Hand

Code of practice for construction of *Pev* type underground rural food grain storage structures
Prefabricated aluminium food grain storage bins
Prefabricated aluminium seed grain storage bins
Code of practice for construction of food grain storage structures suitable for trade and government purposes for the northern region and central region
Methods of re-conditioning partially deteriorated food grain
Plans for layouts of regulated markets and warehouses

ii) *Sugar* — Work relating to sugar is entrusted to the Sugar Industry Sectional Committee. This Committee approved draft Indian Standards for wide circulation for methods of test for vacuum pan sugar, refined sugar, icing and cube sugars. In addition to these items, the Committee also reviewed the Indian Standard Grading for Vacuum Pan Sugar (IS: 498-1953) in the light of the comments received from users and the Development Council for Sugar Industry. In view of the fact that during the last two years the sugar factories in the country had been producing crystal sugar of a grain size which is bigger than what had been specified in IS: 498-1953, the Sugar Industry Sectional Committee decided to modify the existing requirement of grain size Group A. The work of this Committee is being done in close collaboration with the Development Council for Sugar Industry.

Work in Hand

Amendment No. 1 to IS: 498-1953 of Vacuum Pan Sugar
Methods of test for vacuum pan sugar
Refined sugar
Icing sugar
Cube sugar

iii) *Glucose* — While the standards for liquid glucose and dextrose monohydrate had been finalized in the previous year, the colour requirement of liquid glucose continued to be a subject of controversy. The Indian Confectionery Manufacturers' Association had been all along pressing for the requirement to be prescribed so as to give an absolutely water white colour. The previous decision of the Committee at the time of the finalization of the draft standard was 0·4 yellow and 0·2 red in terms of Lovibond unit when tested within a period of 90 days from the date of manufacture. This requirement was not acceptable to ICMA. At the time of finalization of the standard for liquid glucose, the indigenous industry was not in a position to do

anything better so far as colour requirement was concerned. This position was, however, reviewed, and the industry was given a period of six months during which time it was expected of it that it would improve the quality of production so as to prescribe such colour requirement as would be acceptable to the Indian confectionery manufacturers.

Publications

IS: 873-1956 Liquid Glucose
IS: 874-1956 Dextrose Monohydrate

iv) *Edible Starches, Confectionery and Cereal Products* — This work is entrusted to a Sectional Committee of the same designation. As is evident from the name of the Committee, it has a very large scope and has divided its activities into three sectors, namely edible starches, confectionery and cereal products.

During the year under report, standards for sago, edible maize starch (corn flour), arrowroot starch, custard powder, hard boiled sugar confectionery and maida were finalized, and preparation of draft standards for biscuits, semolina, wheat atta, corn flakes, pearl barley, barley powder and baking powder undertaken. The work of this Committee is being done in close collaboration with the Central Committee for Food Standards set up by the Ministry of Health under the aegis of the Prevention of Food Adulteration Act, 1954.

Publications

IS: 899-1956 Sago (Saboodana)
IS: 1005-1957 Edible Maize Starch (Corn Flour)
IS: 1007-1957 Custard Powder
IS: 1009-1957 Maida

Work in Hand

Arrowroot
Hard boiled sugar confectionery
Biscuits
Suji or rava (semolina)
Wheat atta
Corn flakes
Pearl barley
Barley flour
Baking powder

v) *Apiary* — The scope of work assigned to the Apiary Industry Sectional Committee is to formulate standards for various items of bee-keeping equipment, such as hive, super and the frames including floor boards, travelling bee box, honey extractors, honey filters, primary pasteurization unit, bulk honey storage containers, postal bee packages and pedestal for the hive; and for beeswax. The first meeting of the Sectional Committee was held in May 1956 at Mahabaleshwar. The preparation of draft standard for beeswax and different hives and for frames was undertaken.

Work in Hand

Beeswax
Beehives and frames
Honey extractors, strainers and bolting tanks

vi) *Dairy* — The scope of work of formulation of standards for dairy industry is very vast and barring ghee and butter which are under the purview of Agmark, all dairy products, dairy equipment, dairy laboratory apparatus and glassware and dairy utensils have to be gradually taken up by the Dairy Industry Sectional Committee working under the AFDC. This Committee held its first meeting at Bangalore at which the work was divided under the three main groups, namely dairy utensils, dairy products and dairy laboratory apparatus and glassware, and entrusted to subcommittees of the same name.

Work in Hand

Cylindrical glass milk bottles
Milk cans
Milk bottle crates
Milk powder
Condensed milk
Lactose
Casein (acid) edible and Industrial
Gerber method for the determination of fat in whole milk, evaporated (unsweetened) milk, separated milk, skimmed milk, butter milk and cream
Density hydrometers for use in milk
Apparatus for the determination of fat in whole milk, evaporated (unsweetened) milk, separated milk, skimmed milk, butter milk and cream

vii) *Tobacco Products* — While the grading of tobacco is being done by the Agmark, the formulation of standards for tobacco products, namely cigarettes, smoking mixtures, cigars, bidis, hooka tobacco, etc, has been assigned to the Tobacco Products Sectional Committee. This Committee also held its first meeting at Bangalore last year and divided its work under two subcommittees, namely Cigarettes and Smoking Mixtures Subcommittee, and Cigars and Bidis Subcommittee. The formulation of standards for cigarettes was discussed at the meeting, and it was agreed that while it would be difficult to lay down specifications for different brands of cigarettes, the whole group of cigarettes could still be categorized and certain specifications both positive as well as negative usefully prescribed so as to safeguard the interests of smokers.

Work in Hand

Cigarettes
Smoking mixtures
Bidis
Bidi cigarettes

viii) *Poultry and Animal Feeds* — In view of the fact that no specifications for cattle feed have been laid down in the country and that the consumption of cattle feed is likely to increase in the same manner as use of fertilizers has grown, an approach was made to the ISI to lay down standards for a variety of mineral products utilized as cattle feeds. The mineral requirements of cattle feed vary considerably and depend upon the soil that produces the feed and the amount and kind of feed. The soils very greatly in the content of various minerals. The cattle are known to require more than a dozen elements for growth and production. A number of mineral products, such as common salt, calcite, calcium carbonate, magnesium sulphite, calcium phosphate, superphosphate, etc, have been known to be utilized for mixing in the cattle feeds.

ix) *Pest Control Products* — This subject is being handled by the Pest Control Products

Sectional Committee which is a joint responsibility committee of the Agricultural and Food Products Division Council and the Chemical Division Council, the secretariat being with the former. This Committee has covered a very large number of chemicals and their formulations commonly used in the country in the control of pesticides. During the period under review, this Committee finalized standards covering pesticides like BHC emulsifiable concentrates, DDT emulsifiable concentrates, BHC refined, *gamma*-BHC (lindane), lime sulphur solution, pyrethrum extracts, dieldrin and its formulations and nicotine sulphate. With a view to systematizing the common names of pest control, a standard for common names for pest control chemicals was also published.

Publications

IS: 632-1956 BHC Emulsifiable Concentrates
IS: 633-1956 DDT Emulsifiable Concentrates
IS: 881-1956 BHC, Refined
IS: 882-1956 *gamma*-BHC (Lindane)
IS: 885-1956 Common Names for Pesticides
IS: 1050-1957 Lime Sulphur Solution
IS: 1051-1957 Pyrethrum Extracts
IS: 1052-1957 Dieldrin, Technical
IS: 1053-1957 Dieldrin Water Despersible Powder Concentrates
IS: 1054-1957 Dieldrin Emulsifiable Concentrates
IS: 1055-1955 Nicotine Sulphate Solution

Work in Hand

Ethylene dichloride carbon tetrachloride mixture (3:1)

2.6 Structural and Metals Division — In pursuance of the General Council decision reported in the last Annual Report, the Structural and Metals Division Council was inaugurated by Shri Manubhai Shah, Union Minister for Heavy Industries on 26 October 1956 at Calcutta. The scope of work of the SMDC includes basic ferrous metals, steel structurals, structural use of steel, basic non-ferrous metals, non-ferrous metal structurals, structural use of non-ferrous metals, welding, foundry, refractories, and metalliferous minerals.

The first meeting of the SMDC followed immediately after its inauguration. The Council elected Shri J. J. Ghandhy of the Tata Iron & Steel Company Ltd., as its Chairman, and Shri S. L. Kumar and Dr. B. R. Nijhawan as Vice-Chairmen.

The Council set up nineteen sectional committees to deal with the various items of work.

2.6.1 The record of work done during the year under review is summarized in the following figures:

No. of meetings of sectional committees and subcommittees	40
New standards published and in print	15
Standards revised	7
Draft standards finalized	6
Draft standards circulated	22
Draft standards compiled	14
Draft standards under preparation	143

2.6.2 The work of the Division covered the following fields:

i) Metal Standards
ii) Methods of Chemical Analysis
iii) Methods of Physical Tests
iv) Methods of Sampling
v) Steel
vi) Structurals
vii) Structural Engineering
viii) Pig Iron and Ferro Alloys
ix) Cast Iron and Malleable Cast Iron
x) Aluminium and Aluminium Alloys
xi) Copper and Copper Alloys
xii) Lead, Zinc, Tin, Antimony and Their Alloys
xiii) Precious Metals
xiv) Welding General
xv) Structural Welding
xvi) Manganese Ore
xvii) Foundry
xviii) Refractories
xix) Alloy Steels and Special Steels

2.6.3 A brief account of the activities in specific fields is given below:

i) *Metal Standards* — The work under this item includes classification and designations for metals and metal products; and co-ordination of experimental research and investigations required in connection with the work of all committees under SMDC. Five draft Indian Standards relating to preferred dimensions for metal products; thicknesses of sheet and diameters of wire; diameters and thicknesses of metal bars, flats and plate; sizes of strip, sheet, flats and plate; and nominal bores for tube and pipe, were sent out into wide circulation for comments.

Preliminary drafts were prepared on colour coding for identification of metallic materials and glossary of terms relating to iron and steel.

Work in Hand

Preferred dimensions for metal products
Thicknesses of sheet and diameters of wire
Diameters of thicknesses of bars, flats and plate
Sizes for strip, sheet, flats and plate
Nominal bores for tube and pipe
Colour coding for identification of metallic materials
Glossary of terms relating to iron and steel
Code of practice for classification of non-ferrous scrap metals and residues
Corrosion protection of light gauge steel constructions
Performance tests for protective schemes used in corrosion protection of light gauge steel

ii) *Methods of Chemical Analysis* — The work under this item includes preparation of standard methods of chemical analysis required as complimentary standards to material specifications formulated by other sectional committees. Two standards referring to methods of chemical analysis were printed during this year and one finalized draft standard was under print.

Publications

IS: 728-1956 Method for Determination of Weight, Thickness and Uniformity of Coating on Galvanized Articles Other than Wires and Sheets
IS: 964-1956 Methods of Chemical Analysis of Silver Solder
IS: 1047-1957 Methods of Chemical Analysis of Antimony

Work in Hand

Methods of chemical analysis of:
soft solder
white metal bearing alloys
manganese ore
ferro-silicon
ferro-manganese

ferro-chromium
tin ingot
Methods of testing silica sands
Methods of testing tin coating on tin plate

iii) *Methods of Physical Tests* — Standard methods of physical tests required as complimentary standards to material specifications formulated by other sectional committees and also revision of published Indian Standards for physical tests consequent on the introduction of metric system of weights and measures are included under this item.

Work in Hand

Revision of IS: 223-1950 Tensile Testing of Metals (Ferrous)
Revision of IS: 497-1953 Tensile Testing of Metals (Non-Ferrous)
Brinell hardness test
Rockwell hardness test
Vickers hardness test
Impact test
Bend test
Cupping test
Torsion test
Wrapping test

iv) *Methods of Sampling* — The work on sampling was previously being looked after by the subcommittees set up by various sectional committees under their respective fields. This work has now been brought together under one Committee by the SMDC in order to facilitate consideration of all sampling problems relating to metals, metal products, ores and refractories, both from technological and statistical points of view. This Committee would be responsible for the preparation of basic standards on sampling required for guidance in the preparation of various standards relating to metals and metal products, ores and refractories. It will also prepare supplementary standards for groups of metals and their alloys and metal products, and also scrutinize sampling clauses of all standards formulated under the SMDC.

Work in Hand

Basic standards on sampling
Sampling of:
manganese ore
foundry sands
ferro alloys
Certified samples for metallurgical analysis

v) *Steel* — The Committee set up by the SMDC in this field would be responsible for preparation of material specifications for steel and steel products, other than structural sections. During the period under review standards on (i) hot-rolled steel strip (baling), and (ii) steel castings for general engineering purposes were published. A specification for chrome molybdenum steel bars and rods for aircraft purposes is nearing finalization. Four draft standards relating to (i) low alloy high tensile structural steel, (ii) low alloy high tensile steel rivet bars, (iii) rivet bars for structural purposes, and (iv) electrically welded mild steel boiler and superheater tubes [for design steam temperatures not exceeding 455°C (or 851°F)] have been issued into wide circulation for comments.

Preliminary drafts have also been prepared with regard to (i) light gauge structural quality hot-rolled carbon steel sheet and strip, (ii) commercial quality structural steel, (iii) steel tubes and tubulars, (iv) wrought steel for boilers, and (v) rivet bars for boilers.

Publications

IS: 1029-1956 Hot Rolled Steel Strip (Baling)
IS: 1030-1956 Steel Castings for General Engineering Purposes

Work in Hand

Revision of IS: 277-1951 Galvanized Steel Sheets (Plain and Corrugated)
Revision of IS: 278-1951 Galvanized Steel Barbed Wire for Fencing
Revision of IS: 279-1951 Galvanized Iron and Steel Wire for Telephone and Telegraph Purposes
Revision of IS: 280-1951 Mild Steel Wire
Amendment to IS: 226-1955 Structural Steel
Chrome molybdenum steel bars and rods for aircraft purposes
Low alloy high tensile structural steel
Low alloy high tensile steel rivet bars
Rivet bars for structural purposes
Electrically welded mild steel boiler and superheater tubes [for design steam temperatures not exceeding 455°C (or 851°F)]
Light gauge structural quality hot-rolled carbon steel sheet and strip
Commercial quality structural steel
Mild steel tubes and tubulars suitable for screwing to IS: 554-1955 Pipe Threads
Steel tubes for structural use
Wrought steel for boilers, plain carbon
Rivet bars for boilers
Steel wire for manufacture of wood screws
Transmission poles
Steel forgings
Steel tubes for automobile purposes
Steel tubes for general engineering purposes
Cold drawn electrically welded mild steel boiler and superheater tubes
Cold drawn seamless mild steel boiler and superheater tubes [for design steam temperatures not exceeding 454°C (or 850°F)]

vi) *Structurals* — A draft standard for rolled steel beam, channel and angle sections was finalized during the year. This draft standard which was formulated under the Steel Economy Programme of the ISI, specifies properties for structural sections which would lead to considerable increase in efficiency in use. The dimensions are standardized in the metric system. The steel mills now being set up in the public sector will start production with these sections and the existing mills would changeover to them on a phased programme. Draft standards for (i) rolled steel tee bars, and (ii) bulb angles have been issued in wide circulation for comments. Some progress has been made on the standardization of cold formed light gauge structural sections.

The work done by the ISI, on the redesign of hot-rolled structural sections with a view to standardizing sections with improved properties, was reviewed at a meeting of the Latin American experts on steel making and transforming industries. This meeting was organized by the Economic Commission for Latin America and was held at Sao Paulo, Brazil, from 15 to 28 October 1956. The discussions on ISI's work led to the adoption of the following resolution:

" That ECLA should prepare a project for rationalizing and standardizing rolled

steel shapes with a view to its official adoption by all Latin American Countries. It was proposed that this should be done along the lines of the work carried out by the Indian Standards Institution, and possibly with the assistance of this Institution as well as with the co-operation of specialized agencies."

During the year preliminary work was done on the preparation of the structural sections handbook. This handbook will be based on the Indian Standards Structural Sections.

Work in Hand

Rolled steel beam, channel and angle sections
Rolled steel sections, tee bars
Rolled steel sections, bulb angles
Handbook of properties for structural steel sections
Cold-formed light gauge steel structural sections
Rolled steel piling sections
Structural sections for aluminium and aluminium alloys

vii) *Structural Engineering* — The Indian Standard Code of Practice for Use of Structural Steel in General Building Construction (IS: 800-1956) was published during the period under review. The formulation of this standard is an important part of the Steel Economy Programme of ISI. A draft code of practice for the use of steel tubes in general building construction and a draft specification for pressed steel tanks, have been sent out in wide circulation for comments. Considerable progress has been made regarding the formulation of a code of practice for the use of cold-formed light gauge steel sections in structures. The work on the formulation of codes of practice for design and fabrication of storage tanks, overhead transmission line towers, cranes and hoists, etc, continued during the year.

Preliminary work has been done towards the preparation of a handbook for structural engineers. The use of this handbook in conjunction with the design code would help to ensure that structural designs are economical in the use of steel and at the same time make design procedures less arduous and time consuming.

Publication

IS: 800-1956 Code of Practice for Use of Structural Steel in General Building Construction

Work in Hand

Code of practice for use of steel tubes in general building construction
Specification for pressed steel tanks
Code of practice for use of cold-formed light gauge steel sections in structures
Rules for design, construction, erection, testing, operation, maintenance and inspection of cranes and hoists
Code of practice for design, fabrication and erection of mild steel tanks for storage of oil
Code of practice for design, fabrication and erection of mild steel tanks for storage of water
Code of practice for gas storage tanks
Code of practice for use of steel in overhead transmission line towers
Code of practice for use of steel in radio masts
Code of practice for light weight open web steel joist construction
Code of practice for high strength bolting in structures
Code of practice for use of steel in temporary construction
Handbook for structural engineers

viii) *Pig Iron and Ferro Alloys* — During the period under review draft specifications for ferro-manganese, ferro-chromium, ferro-Silicon and Spiegeleisen were sent out into wide circulation for comments. These four draft standards are expected to be printed during the coming year.

Publication

IS: 225-1957 Pig Iron (Charcoal) (*Revised*)

Work in Hand

Revision of IS: 224-1950 Pig Iron (Coke)
Ferro-silicon
Ferro-manganese
Spiegeleisen
Ferro-chromium
Ferro-phosphorus
Ferro-titanium
Ferro-vanadium
Ferro-tungsten
Ferro-molybdenum
Silico-manganese

ix) *Cast Iron and Malleable Cast Iron* — The Sectional Committee set up by the SMDC in this field has been made responsible for the preparation of specifications for cast iron and malleable cast iron and castings. A draft standard for pipes for water, gas and sewage (vertically and centrifugally cast) and specials for use therewith had previously been prepared on the basis of inch units and had been sent out in wide circulation for comments. The change-over to the metric system has made it necessary to revise this draft standard.

A draft standard for cast iron rain water pipes and fittings has been approved for wide circulation for comments.

Work in Hand

Amendment to IS: 210-1955 Grey Iron Castings
Cast iron rain water pipes and fittings
Pipes for water, gas and sewage (vertically cast) and specials for use therewith
Cast iron flanged pipes and fittings
Centrifugally cast (spun) iron pipes for water, gas and sewage
Cast iron spigot and socket soil waste and ventilating pipes and fittings

x) *Aluminium and Aluminium Alloys* — During the period under review five Indian Standards for various types of wrought aluminium and aluminium alloys were published and another two were under print. Revision of five printed standards was taken up.

The Indian Standard Specification for Aluminium-Manganese Alloy Sheets and Coils (IS: 31-1950) was withdrawn in view of the preparation of a comprehensive standard for wrought aluminium and aluminium alloys, sheet and strip, for general engineering purposes (IS: 737-1955).

Preliminary drafts have been prepared on (i) aluminium shot for use in iron and steel manufacture, (ii) wrought aluminium and aluminium alloys, bolts and screw stock, and (iii) corrugated aluminium sheet.

Publications

IS: 734-1956 Wrought Aluminium and Aluminium Alloys, Forgings
IS: 735-1956 Wrought Aluminium and Aluminium Alloys, Forging Stock
IS: 736-1956 Wrought Aluminium and Aluminium Alloys, Plate
IS: 738-1956 Wrought Aluminium and Aluminium Alloys, Tube

Work in Hand

Revision of IS: 20 and 21-1953 for Cast Aluminium for Utensils and Wrought Aluminium for Utensils
Revision of IS: 22-1950 98 Percent Aluminium Notched Bars and Ingots for Remelting Purposes
Revision of IS: 23-1950 99 Percent Aluminium Notched Bars and Ingots for Remelting for Aircraft Purposes
Revision of IS: 202-1950 Aluminium Alloy Ingots and Castings for Aircraft Purposes
Revision of IS: 617-1955 Aluminium and Aluminium Alloy Ingots and Castings for general Engineering Purposes
Aluminium shot for use in iron and steel manufacture
Wrought aluminium and aluminium alloys, bolts and screw stock
Wrought aluminium and aluminium alloys, extruded round tubes and hollow sections
Corrugated aluminium sheet
Code of practice for die-casting aluminium alloys
Aluminium master alloys
Aluminium re-draw bars for conductors
Aluminium utensils
Structural aluminium alloys

xi) *Copper and Copper Alloys* — Two Specifications for (i) Brazing Solder (IS: 24-1956), and (ii) Silicon Bronze Ingots and Castings (IS: 1028-1956), were printed during the year. Revision of six printed standards was taken up. Draft revision of IS: 191-1950 Specification for Copper, and preliminary draft for brass ingots for gravity die castings and brass gravity die castings (including naval brass) was prepared.

Standardization of copper sheet and strip, copper sheet for manufacture of utensils and copper tubes for general purposes was also taken up.

Publications

IS: 24-1956 Brazing Solder (*Revised*)
IS: 1028-1956 Silicon Bronze Ingots and Castings

Work in Hand

Revision of IS: 26-1950 Phosphor Bronze Ingots and Castings
Revision of IS: 191-1950 Copper
Revision of IS: 319-1951 Free Cutting Brass Rods and Brass for Use in Screw Machines
Revision of IS: 320-1951 High Strength Brass Rods, Bars and Sections
Revision of IS: 407-1953 Brass Tubes for General Purposes
Revision of IS: 410-1953 Rolled Brass Plate, Sheet, Strip and Foil
Brass ingot for gravity die castings and brass gravity die castings (including naval brass)
Phosphor bronze sheets, rods and wire
Non-ferrous non-magnetic materials
Leaded brass strips used in the manufacture of parts for clocks and watches and for other instruments
Brass sheet for manufacture of utensils
Copper sheet and strip
Copper sheet for manufacture of utensils
Copper tubes for general purposes

xii) *Lead, Zinc, Tin, Antimony and Their Alloys* — During the period under review revisions of five Indian Standards were published. Standardization work on protective coatings for zinc base alloys; nickel and nickel alloys; and recommended methods for polarographic and spectrographic analysis of high purity zinc and zinc alloys for die castings have been started.

A draft revision of Indian Standard Specification for Antimony (IS: 211-1950) was approved for wide circulation.

Publications

IS: 26-1956 Tin Ingot (*Revised*)
IS: 27-1956 Pig Lead (*Revised*)
IS: 192-1956 Silver Solder (*Revised*)
IS: 193-1956 Soft Solder (*Revised*)
IS: 209-1956 Zinc (*Revised*)

Work in Hand

Revision of IS: 25-1950 Antifriction Bearing Alloys
Revision of IS: 211-1950 Antimony
Revision of IS: 404-1952 Lead Pipes for Other Than Chemical Purposes
Chemical lead
Code of practice for the manufacture and use of zinc base die castings
Recommended methods for polarographic and spectrographic analysis of high purity zinc and zinc alloys for die castings
Zinc base alloys other than for die castings
Zinc sheet
Antimonial lead, rolled and extruded
Type metal
Protective coatings for zinc base alloys
Nickel and nickel alloys

xiii) *Precious Metals* — Work in this field has been initiated in response to request from Central and State Government agencies and organized trade interests in India. An important aspect of the work is rationalization of grades for gold and silver alloys so that the provisions of State legislations from all parts of India may have a uniform basis.

Work in Hand

Gold alloys
Fine gold
Fine silver
Platinum
Silver solder
Gold solder
Carat gold
Palladium
Dental amalgam alloy

xiv) *Welding, General* — The scope of work under this item includes specifications for welding electrodes, equipment and accessories, and code of practice for the procedure, inspection and testing in connection with the welding of ferrous and non-ferrous metals and alloys. Three standards are under publication in this field and three others on (i) glossary of terms relating to welding and cutting of metals, (ii) code of practice for safety and health requirements in electric and gas welding and cutting operations, and (iii) code of practice for training and testing of metal arc welders, were finalized.

Draft standards relating to (i) filler rods for gas welding, (ii) equipment for eye and face protection during welding, (iii) recommendations for radiographic examination of fusion welded joints, (iv) hose connections and valve fittings for oxyacetylene welding, and (v) tests for use in the approval of manual metal arc welders have been approved for circulation.

Publications

IS: 813-1956 Scheme of Symbols for Welding
IS: 814-1956 Covered Electrodes for Metal Arc Welding of Mild Steel
IS: 815-1956 Classification and Coding of Covered Electrodes for Metal Arc Welding of Mild Steel and Low Alloy High Tensile Steels

Work in Hand

Glossary of terms relating to welding and cutting of metals
Code of practice for safety and health requirements in electric and gas welding and cutting operations
Code of practice for training and testing of metal arc welders

Filler rods for gas welding
Equipment for eye and face protection during welding
Recommendations for radiographic examination of fusion welded joints
Hose connections and valve fittings for oxyacetylene welding
Tests for use in the approval of manual metal arc welders
Welding rods and electrodes for surfacing work
Arc welding plant and equipment
Assessment of welds by radiographic examination
Procedure code for manual metal arc welding of structural steel
Code of practice for inspection of welds
Codes of practice for use of welding in boilers
Codes of practice for use of welding in weldments (built-up sections for use in place of steel castings)
Code of practice for argon arc welding of aluminium and stainless steel
Handbook for use of welding inspectors and welding supervisors

xv) *Structural Welding* — Code of Practice for Use of Metal Arc Welding for General Construction in Mild Steel (IS:816-1956) is under publication. This code is complimentary to Code of Practice for Use of Structural Steel in General Building Construction (IS:800-1956) formulated under the Structural Engineering Sectional Committee.

A draft code of practice for resistance spot welding for light assemblies in mild steel has been finalized for publication. Considerable progress was also made with regard to the formulation of comprehensive handbooks for the use of metal arc and gas welders.

Publication

IS: 816-1956 Code of Practice for Use of Metal Arc Welding for General Construction in Mild Steel

Work in Hand

Code of practice for resistance spot welding for light assemblies in mild steel
Code of practice for use of welding in structures subject to dynamic loading — bridges
Code of practice for use of gas welding in structural work
Code of practice for resistance seam welding for light assemblies in mild steel
Codes of practice for use of welding in pipelines
Codes of practice for use of welding in tubular construction
Handbook for welders
Handbook for use of welding engineers

xvi) *Manganese Ore* — The revision of tentative Indian Standards on manganese ore was taken up.

Work in Hand

Revision of IS: 372-1952 Manganese Ore (Battery Grade)
Revision of IS: 373-1952 Manganese Ore (Metallurgical Grade)

xvii) *Foundry* — A draft specification for foundry moulding boxes has been sent out into wide circulation for comments. Tests on different grades of foundry facing materials were conducted at the National Metallurgical Laboratory during the period under review. On the basis of these investigations it would be possible now to formulate the specification on foundry facing materials.

Work in Hand

Foundry moulding boxes
Foundry facing materials
Basic characteristics for sand for different moulding purposes
Recommended methods of testing foundry sands
Recommended characteristics for binding materials
Recommended methods of testing binding materials
Silica sands

xviii) *Refractories* — During the period under review, data was collected on ladle and casting pit refractories. Data was also collected on refractories for the glass industry.

Work in Hand

Classification of clays for ceramic industry
Dimensional standardization of refractories
Ladle refractories
Casting pit refractories
Preferred sizes for firebricks
Tank blocks
Insulating firebricks

xix) *Alloys Steels and Special Steels* — Various industries in India are at present using alloy and special steels conforming to their own specifications and specifications of several overseas standards bodies. In the former case, they have mostly been adopted from organizations in overseas countries which collaborated in the setting up of the particular industries in India. This procedure has resulted in the use in India of alloy and special steels of a very large number of varieties. The existence of such great variety in specifications has been a serious handicap to the indigenous production of alloy and special steels. The rationalization of alloy and special steels has, therefore, been given considerable importance and priority. After rationalization it will be necessary to prepare specifications for the rationalized items. In the formulation of the specifications the special conditions prevailing in India as regards raw materials, production technique, etc, will be kept in view. During the year under review preliminary work on this subject was done.

Work in Hand

Rationalization of wrought carbon and alloy steels for general engineering purposes

2.6.4 *Steel Economy Section* — The third and last meeting of the Structural Steel Sectional Committee (BDC 7, Steel Economy Committee), of the ISI was held on 13 December 1956 in Delhi. This marked the completion of the first phase of the Steel Economy work of the ISI, started early in 1954. The second and subsequent phases of the Steel Economy work will be continued by the various sectional committees under the Structural and Metals Division Council. The Steel Economy Programme was taken up by the ISI on the recommendations of the Planning Commission and at the request of the Government of India. This programme included the preparation of not only standard specifications and codes of practice, but also handbooks and other publications as aid to the implementation of the standards.

In the Report submitted by the Steel Economy Committee to the Government of India and the Planning Commission, special attention was drawn to the following practical aspects of implementation:

"A co-ordinated plan for the works-cum-field implementation of the Steel Economy Programme has to be formulated and worked. The Government of India and the Planning

Commission may consider the setting up of a suitable Body with powers to co-ordinate and effect this implementation. The Structural and Metals Division Council (SMDC) and the committees of the ISI responsible for the formulation of the standards, procedures, etc, which are to be implemented, should be closely associated with this Body.

" **Hot-rolled Section** — The implementation of the Indian Standards for hot-rolled sections, does not present any serious difficulties. TISCO in their new mill and the steel mills at Bhillai and Durgapur, are expected to start production with the Indian Standard sections. In the preparation of the standards for sections, the capabilities and limitations of these mills have been particularly kept in view. As regards the existing mills of TISCO, IISCO and Mysore, the changeover to new sections would be on a programme phased over a period of time.

" **Cold-formed Light-Gauge Sections** — For production of cold-formed light-gauge sections, strip steel of properties and widths covering the full requirements would become available in India only after production starts at Rourkela in 1958. Hot-rolled strip up to $12\frac{1}{2}$ in. in width will be available from the Tata Iron & Steel Co. Ltd., if sufficient orders for structural quality material are placed. The immediate implementation of the standards for cold-formed sections, therefore, depends on imported strip being made available and subsidized to the same extent as mild steel of other categories. It should be possible to give an impetus to the setting up of production units for the manufacture of cold-formed sections through encouragement by Government by way of loans, etc, and also through consuming departments of the Central and State Governments accepting tenders for structures made from cold-formed sections, on a competitive basis, as compared to structures made from hot-rolled sections. The savings in steel through use of cold-formed light-gauge sections in certain structures will be as large as 40 percent. By using strip steel from indigenous production or imported strip subsidized to the same extent as imported mild steel, there will be appreciable savings in overall cost also.

" **Steel Tubes** — It is understood that the indigenous capacity for steel tubes up to 3 in. diameter leaves a surplus which could be diverted for structural use and further that the indigenous production of tubes up to 6 in. diameter is expected to start shortly. With the same type of encouragement as mentioned in para above, it should be possible to popularize the use of steel tubes as structural material.

" **Efficient Designs** — The wide scale adoption in India of IS: 800-1956 Code of Practice for Use of Steel in General Building Construction, would lead to considerable savings in steel. Since the Central and State Governments have to set the pace in this connection, their co-operation is essential. With this co-operation, there is no doubt that the private agencies would also accept this code for their design offices.

" The extent to which a code of practice could lead to a satisfactory design, greatly depends on the care and effort applied in the preparation of designs using the code. It is a matter of general opinion that there is considerable scope for improving the standard of design procedures in most organizations. A possible method by which this may be achieved is through a technical check on demands for steel to see that they are based on efficient and economic designs. This check may be enforced at the organizational level and, in some cases, also by the Iron and Steel Controller.

" **Untested Steel** — An appreciable tonnage of steel meant for structural purposes goes, at present, under the category of ' untested steel '. Since the strength property of this steel is not guaranteed or definitely known, it is not possible to use this steel efficiently by allowing stresses and loads to the maximum safe limits. The Structural Steel Sectional Committee (BDC 7), has recommended that a separate standard should be drawn up for ' Commercial ' quality steels which, even though not up to the requirements of the normal ' tested ' quality steels, are usable, provided their physical and chemical properties are known and guaranteed.

" Apart from this, consideration deserves to be given as to how far it is possible to reduce the tonnage of steel which has to be classified as not coming up to the present standards for structural steel.

" **Welding** — There is already in India, a growing appreciation of the advantages which welding could afford in many cases of structural steel fabrication. But the natural reluctance of established fabricators to changeover from riveted to welded fabrication procedures is even now acting as a retarding factor on this progress. An increased insistence by Government Organizations for welded fabrication could improve the situation. Apart from this, new fabricating organizations springing up in the private and public sectors, should be encouraged to set apart an appreciable proportion of their capacity for welded fabrication.

" In order to implement the standards for welding and for popularizing welding in India, it is also necessary that:

a) The Government should help in making available, more freely, suitable wire for the manufacture of electrodes in this country;

b) As transformers suitable for welding sets are not produced in India at present, the import of such transformer welding sets should be permitted freely and the import duty on such transformer sets should be reduced in order to make them available more cheaply;

c) The import of oxygen cutting equipment should also be permitted freely and the import duty on such equipment should be reduced in order to make available in the country, equipment of satisfactory quality at reasonable prices;

d) Technical institutions and universities in India should expand the facilities for the training of welding engineers, who would have a sound basis of both practical and theoretical aspects of welding; and

e) Basic trade schools and other facilities for training of welders should be established in various parts of the country. The procedure and syllabus for training and testing of welders should be in accordance with the Indian Standard on the subject. The certification of welders should be arranged through a centrally controlled organization.

" **Research** — In spite of the fact that the CSIR had extended its full support to the whole programme of research drawn-up by the Structural Steel Research Subcommittee (BDC 7: 4), the progress achieved so far is not quite satisfactory. It has been possible to get accepted for research, only 10 out of 21 of the items considered as requiring immediate attention for research. Of the various institutions in India approached with a request that they may take up these investigations, only 8 have found it possible to take up any item. Since the large scale development of research in steel structural engineering is an essential requirement for placing the steel industry in India on a sound footing, thought should be given as to how far the present position can be improved. This need is all the greater, since a very large expansion in steel production and consumption is planned during the Second Five Year Plan and thereafter.

" The steel structural engineering and the welding sections of the research laboratories in India require to be strengthened in order to enable them to meet the country's immediate demand for expansion of experimental research in these fields".

2.7 Electrotechnical Division — In pursuance of the decision of General Council reported last year, the Electrotechnical Division Council (ETDC) was inaugurated by Shri Morarji Desai, Union Minister for Commerce and Industry, and President ISI, on 28 March 1957. The Council unanimously elected Shri M. Hayath, Member (Hydro-Electric), Central Water and Power Commission, as chairman and Shri B. V. Baliga, Chief Engineer, All India Radio, as vice-chairman. A Standing Working Committee was set up with the chairman, vice-chairman and 15 other members of the ETDC as its members. The sectional committees on electrical subjects, which were previously functioning under the Engineering Division Council were re-organized and re-designated as follows, to work under the new Division Council:

ETDC 1 Electrotechnical Standards
ETDC 2 Electrical Conductors and Accessories
ETDC 3 Electrical Insulators and Accessories
ETDC 4 Electrical Plant and Switchgear
ETDC 5 Electric Fans
ETDC 6 Electrical Instruments and Meters
ETDC 7 Electrical Accessories
ETDC 8 Radio Equipment
ETDC 9 Mica
ETDC 10 Primary Cells and Batteries
ETDC 11 Secondary Cells and Batteries
ETDC 12 Electroplating
ETDC 13 Illumination Engineering

2.7.1 Continuing efforts, made over a number of years, resulted in references being made to electrical standards in the revised Indian Electricity Rules, 1956. Similar stress was laid on standardization and its implementation through certification marks at the Development Councils for Heavy Electrical Industries and Light Electrical Industries. This resulted in the passing of a resolution by the Development Council for Light Electrical Industries in which it was recommended that suitable legislative steps should be taken to ensure that only such electrical apparatus and appliances as would comply with minimum safety requirements were offered for sale to the public. In his inaugural address to the ETDC, the President ISI also emphasized the need to use electrical standards, and in particular, those concerned with safety.

2.7.2 At the Commonwealth Standards Conference held in New Delhi in January 1957, technical sessions on the following subjects afforded opportunity for exchange of views and for the appreciation of the special needs of the tropical countries:

a) Electrical equipment of machine tools
b) Electric cables
c) Safety requirements for domestic electrical appliances.

Details are given separately.

Shri J. P. Mehrotra, Deputy Director in charge of the Division was nominated as one of the three representatives of India in the Team of Electric Power Experts from Asia and the Far East, which visited Russia, a number of Continental countries, UK, USA and Japan to study developments in the electrical manufacturing industry and techniques of electric power generation and utilization.

2.7.3 Greater emphasis is now being laid on codes of practice. Particular mention may be made of the code of practice for installation and maintenance of the commonly used types of induction motors; and a similar draft code of practice for underground cables. The Central Water & Power Commission, with which the Institution works in the closest collaboration, gave due recognition to the need for the continuation of this work on a wider basis and to complement the work being done by the Institution on standardization of materials. The Power Wing of the Central Water & Power Commission has set up a Section for preparation of other codes of practice. A close liaison with the organization will be continued in this activity.

2.7.4 The record of work for the year under this Division is summarized in the following figures:

No. of meetings of sectional committees, subcommittees and panels	32
New standards published and in press	6
Amendments to standards	2
Draft standards finalized	20
Draft standards widely circulated	5
Draft standards compiled	13
Draft standards under preparation	81

2.7.5 The work of the Division during the year covered the following fields:

i) Electrical Conductors and Insulators
ii) Electrical Plant and Switchgear
iii) Electrical Instruments
iv) Domestic Electrical Appliances
v) Radio Equipment
vi) Mica

vii) Batteries

viii) Electroplating

2.7.6 A brief account of the work accomplished during the year under each of these fields is given below:

i) *Electrical Conductors and Insulators* — Draft specifications for impregnated paper insulated lead-sheathed cables and rubber-insulated cables for mines were finalized and these are to be published as four distinct standards as shown below under 'Work in Hand'.

Work in Hand

Revision of IS: 282-1951 Hard-Drawn Copper Solid and Stranded Circular Conductors for Overhead Power Transmission Purposes (*Tentative*)
Revision of IS: 283-1951 Porcelain Insulators for Telegraph and Telephone Lines
Revision of IS: 398-1953 Hard-Drawn Stranded Aluminium and Steel-Cored Aluminium Conductors for Overhead Power Transmission Purposes
Trailing cables for coal mines
Paper-insulated lead-sheathed cables for electricity supply flexible trailing cables for quarries and metalliferous mines
Paper-insulated lead-sheathed cables for use in mines
Code of practice for installation, operation and maintenance of impregnated paper-insulated solid type lead-sheathed power cables up to and including 33 kV
Porcelain insulators for overhead power distribution lines up to 650 V
Spindles for insulators
Trolley and contact wires for electric traction hard-drawn cadmium copper solid and stranded circular conductors
Paper-covered rectangular copper conductors for transformer windings
Enamelled round copper wire (enamelled with vinyl acetal base)
Braided cables with copper conductors for overhead transmission
Vulcanized rubber insulation and sheath for electric cables
PVC insulation and sheath for electric cables
Hardware fittings for low tension insulators
Hardware fittings for pin insulators up to 33 kV
Code of practice for selection and use of insulators

ii) *Electrical Plant and Switchgear* — Indian Standard Specification for Three-Phase Induction Motors for Industrial Use was amended to include class 'E' insulation. The Tariff Commission and the States showed great interest in early finalization of the draft Indian Standard Specification for Outdoor Type Distribution Transformers Up to 100 kVA 11 kV. The Subcommittee concerned met twice to consider the comments received as a result of general circulation.

Publications

IS: 900-1956 Code of Practice for Installation and Maintenance of Medium Pressure Three-Phase Induction Motors and Allied Equipment for Industrial Use

Work in Hand

Revision of IS: 325-1956 (*Amended*)
Small AC and universal electric motors with Class 'A' insulation
Outdoor type distribution transformers up to 100 kVA 11 kV
Pedestal type electric fans
Dimensions of three-phase induction motors
Air circulator type electric fans
Recommendations for tropic finish of switchgear
Starters and controlgear
HT and LT porcelain bushings for transformers
Cable terminals for transformers
Fans for navy
Code of practice for installation and maintenance of switchgear
Code of practice for installation and maintenance of transformers
Code of practice for earth leakage protection
Carbon brushes

iii) *Electrical Instruments* — Specification for AC Whole Current Electricity Meters (Parts I and II) was published in 1955. Work was started on Part III which covers whole current and transformer-operated kilowatt hour meters for (a) balanced and unbalanced load for use in 3-phase, 3-wire and 3-phase 4-wire supplies, (b) 2-phase 3-wire or 4-wire supplies, (c) single phase 3-wire supplies, and (d) single phase 2-wire supplies.

Work in Hand

Electrical indicating instruments
Polyphase AC meters
DC energy meters
Meters for use with current transformers
Shunts, resistors and instrument transformers
Temperature indicating instruments

iv) *Domestic Electrical Appliances* — Implementation of standards on electrical appliances already published was given due consideration during this period. At the time of their finalization it was hoped that their publication would go a long way towards improving the quality of Indian manufactured appliances. It was apparent that no such result had emerged, and it was common experience to come across in the market cheap types of unsafe appliances. The Sectional Committee at its last meeting held on 4 July 1956 at Calcutta made a strong recommendation to the Government of India to take early steps to review the position and to take necessary steps to encourage manufacture of electrical accessories to specifications and prevent actively the manufacture of non-standard domestic electrical appliances. Draft standards for single pole tumbler switches; and reversible type two pin plugs and socket outlets with earthing connections were finalized. On receipt of some comments from the Government Test House it was decided to issue in general circulation once again the draft on tungsten filament electric lamps for railway rolling stock.

Work in Hand

Revision of IS: 418-1953 Tungsten Filament General Service Electric Lamps
Single pole tumbler switches
Reversible type two pin plugs and socket outlets with earthing connections
Tungsten filament electric lamps for railway rolling stock
Three pin plugs and socket outlets
Bayonet lamp-holders
Soldering irons
Electric toasters
Electric sauce pans
Electric call bells and buzzers
Bed switches
Iron-clad switches
Fuses
Ballasts for fluorescent lamps
Telephone switch-board lamps
Automobile lamps
Radio dial lamps
Steel conduits and fittings for electrical wiring

v) *Radio Equipment* — Indian Standards for 6-Volt Accumulator Operated Community Radio Receivers; Methods of Measurements

on Loudspeakers and Loudspeaker Systems; General Requirements and Tests for Diaphragm-Operated Pressure Units and Horn Type Loudspeaker Systems; General Requirements and Tests for Direct Radiator Moving Coil Loudspeakers and Loudspeaker Systems for use with Community Radio Receivers were published. The four standards on loudspeakers mark the beginning of the work of this Committee in the acoustical equipment field. Draft standard for general purpose low frequency chokes, and draft code of safety requirements for mains-operated radio receivers were under finalization.

Publications

IS: 1031-1957 Methods of Measurements on Loudspeakers and Loudspeaker Systems
IS: 1032-1957 General Requirements and Tests for Diaphragm-Operated Pressure Units and Horn Type Loudspeaker Systems
IS: 1033-1957 General Requirements and Tests for Direct Radiator Moving Coil Loudspeakers
IS: 1034-1957 Loudspeaker Systems for Use with Community Radio Receivers
IS: 1036-1957 6-Volt Accumulator Operated Community Radio Receivers

Work in Hand

Code of safety requirements for mains-operated radio receivers
General purpose low frequency chokes
Safety requirements for mains-operated amplifiers
Condensers for telegraph and telephone equipment
Fixed and variable wire wound resistors
Composition resistors
Ceramic capacitors
Condensers for electric fans
Aerial wires, insulated and bare copper
Hook-up wires for radio equipment
Eelectrolytic condensers
Wave band switches
Potentiometers
'Standard' community radio receivers
Communication receivers
Receivers for school broadcasting
Methods of test on R.F. transformers and coils
Methods of test on I.F. transformers
Interference suppression devices
Interstage transformers
Microphone transformers
Vibrator transformers
Mechanical durability tests for electronic components
Climatic tests for complete electronic equipment
Code of practice for the installation of public address amplifier systems
Minimum performance requirements for public address amplifiers
General requirements for audio amplifiers
Microphones
Pick-ups
Tape recorders
Acoustical terminology

vi) *Mica* — The ISI Sectional Committee on Mica acts as the secretariat of the ISO Committee for Mica. At the national level, the Committee took up the revision of the tentative Indian Standards for Grading and Classification of Muscovite Mica published in 1949. Draft revisions incorporating the recommendations of the International Committee were prepared and are under circulation.

Work in Hand

Definitions of mica terms
Grading and classification of muscovite mica blocks
Thins and condenser films
Grading and classification of muscovite mica splitings

vii) *Batteries* — Draft specifications covering lead-acid storage batteries for public service and commercial motor vehicles, heavy duty; and lead-acid storage batteries for motor cycles; and glossary of terms for primary cells and batteries were finalized.

Work in Hand

Revision of IS: 203-1950 Leclanché Type Dry Cells and Batteries for Flash Lamps
Revision of IS: 267-1951 Leclanché Type Inert Cells
Revision of IS: 268-1951 Leclanché Type Sack Cells
Revision of IS: 395-1952 Lead-Acid Storage Batteries for Motor Vehicles, Light Duty (*Tentative*)
Revision of IS: 541-1954 Stationary Accumulators, Lead-Acid Type (*Tentative*)
Revision of IS: 556-1954 Leclanché Type Dry Batteries for Radio Receivers (*Tentative*)
Glossary of terms for primary cells and batteries
Lead-acid storage batteries for motor vehicles, heavy duty
Lead-acid storage batteries for motor cycles
Glossary of terms for secondary cells and batteries
Hard rubber containers for lead-acid accumulators
Lead-acid storage batteries for aircraft battery separators
Alkaline batteries

viii) *Electroplating* — Draft standards covering copper, nickel and chromium electroplated coatings; and commercial silver plating for articles for domestic and restaurant use were finalized.

Work in Hand

Copper, nickel and chromium electroplated coatings
Commercial silver plating for articles for domestic and restaurant use
Cadmium plating
Oxy copper finishes
Zinc plating
Tin plating
Gold and silver threads
Hard chromium plating

2.8 Sectional Committees Under the Executive Committee — Subjects which are of general interest to all the technical divisions and sections, and also those which have a bearing on policy as a whole are dealt with by sectional committees established under the direct authority of the Executive Committee. These committees for the time being deal with Documentation, and Style Manual, whose work during the year is briefly reported below. The subject of quality control and industrial statistics, the sectional committee for which was dissolved during the year, is dealt with under the Statistical Section. Developments on the subject of weights and measures during the year are reported separately under 1.6 (*see* p. 3).

2.8.1 *Documentation* — The five Indian Standards on preliminary pages of a book covering its general structure, the half-title leaf, the title leaf, the author statement in the title page and the table of contents were printed during the year under report and submitted to the International Organization for Standardization as basis for formulating draft International Recommendations for acceptance by all member-countries of the ISO.

An important new item on which work was initiated by the Books and Periodicals Subcommittee was concerned with proof correction symbols. At the suggestion of the chairman, the draft standard on glossary of cataloguing terms was withheld for inclusion of more terms before sending it out into circulation.

Further work was also pursued by the Library Technique Subcommittee in preparing the draft on the lay out of library catalogue code.

2.8.2 *Style Manual* — The Indian Standard Style Manual for Drafting Indian Standards (IS: 12) was originally prepared in 1949 for the guidance of technical committees and staff of the ISI entrusted with the task of drafting, editing and publishing Indian Standards and other technical documents. As a result of the experience gained in its use during the last eight years, the need for its revision was felt in order to develop a standard practice to meet the peculiar needs of the Institution for preparing specifications, test methods, codes of practice, report and similar other documents. Accordingly, a draft revision of the standard was prepared for consideration by the Directorate Standards Sectional Committee (EC 5) which would approve it for putting into circulation for eliciting comments.

2.9 Statistical Section — The Statistical Section took further strides during the year under review in various directions of its activities. Its main function being to advise other divisions and sections of the Institution on statistical matters related to the work of standardization, its efforts were constantly directed towards making ISI committees and others engaged in the work of standardization, conscious of the need of statistical examination of data in the formulation of national standards. A number of interesting problems were referred to the Section during the year by various ISI committees which indicated a wider recognition of statistical concepts by them. It has thus been possible to introduce statistical quality control concepts in many of the Indian Standards formulated during the year.

Preparation of two standards on conversion factors, for which a great demand created by Government of India's decision to changeover to the metric system, has been one of the major achievements of the Statistical Section during the year under review.

The Quality Control and Industrial Statistics Sectional Committee (EC 3) which was set up in early 1948 to advise other committees of ISI on statistical matters, was dissolved by the Executive Committee of the Institution during the year, as the EC felt that the work could now be undertaken by the Statistical Section. For improving sampling clauses in Indian Standards, the EC, at the same time, requested the various division councils of the Institution to examine the question of setting up independent sectional committees under each of them to be entrusted with the specific work of formulation of standards on methods of sampling. For the same purpose, the EC also requested the division councils to appoint statisticians in the existing committees wherever considered necessary. In pursuance of EC's recommendations, a Sectional Committee on 'Methods of Sampling' (SMDC 4) was set up during the year under the Structural and Metals Division Council.

2.9.1 The work of the Section during the year covered:

i) Introduction of SQC concepts in standards
ii) Indian Standards on conversion factors and conversion tables
iii) Standards on sampling
iv) Sampling for certification marks scheme
v) Miscellaneous

A brief account of the work done by the Section during the period is given below:

i) *Introduction of SQC Concepts in Standards* — To propagate the concepts of SQC to a wider group of people interested in the work of standardization, the officers of the Section participated at technical conferences organized during the year by the Delhi Cloth Mills, Government Test House, and Indian Statistical Institute, and contributed technical papers bringing out the various applications of statistical methods in solving problems of standardization. The officers of the Section also attended the various technical committee meetings of the Institution, wherever an opportunity arose for bringing out the importance of statistical concepts in formulation of standards under consideration of the Committee. During the year Prof. G. A. Barnard of Imperial College, London, and Mr. D. J. Desmond, SQC Consultant from UK (at present with the SQC Unit at Calcutta) visited the Institution and discussed with the heads of various technical sections of ISI the usefulness of statistical methods in solving problems of standardization.

The Section scrutinized all the draft standards sent out for wide circulation during the year with the object of introducing SQC concepts in them. The work done by the Section about the sampling clauses based on sound statistical principles in the material specifications prepared by the various committees of the ISI could be specially mentioned in this connection. During the year under review, sampling schemes on statistical basis have been recommended in 70 draft Indian Standards and in most cases, these schemes have been adopted by the technical committees concerned.

In the past it had been the practice in Indian Standards on methods of test to require evaluation of the quality of the bulk of material by using the average of the test results without any regard to the variability among the individual results. Efforts have been successful in a number of cases in bringing to the notice of the committees the importance of reporting the variability of the characteristics through standard deviation along with the average value. In this connection Indian Standard Methods of Sampling and Test for Oil Tanned Leathers (IS: 1016-1956) and Indian Standard Methods of Sampling and Test for Paper and Allied Products, Part I (IS: 1060-1957) may be specially mentioned. Other problems, such as judging the significance of difference between average values of two groups of test results, etc, have also been satisfactorily solved and the results incorporated in certain standards.

ii) *Indian Standards on Conversion Factors and Conversion Tables* — Government of India's decision to adopt metric system as the only system of weights and measures

in the country, and also the decision to decimalize the currency of the country, created the need for a suitable publication for conversion factors and conversion tables. On the recommendation of the EC, the Statistical Section undertook the task of formulating the following two comprehensive Indian Standards on conversion factors and conversion tables, which are designed to assist trade, industry, Government departments, engineers, technologists, scientists and others interested in quick and accurate inter-conversion of values:

IS: 786-1956 Indian Standard Conversion Factors and Conversion Tables

IS: 1020-1957 Indian Standard Conversion Tables for Ordinary Use

These standards, unlike other Indian Standards, have been finalized by the Section in consultation with other divisions and sections of the Institution during the year and issued as Indian Standards under direct authority of the Executive Committee of the Institution.

iii) *Standards on Sampling* — The Subcommittee on Sampling of Textile Materials (EC 3:4) set up to examine the sampling clauses of the various standards on textile materials, i.e. fibres, yarn and fabrics, finalized the draft Indian Standard Method of Sampling of Cotton Yarn for Determination of Physical Characteristics, which is being considered by the Textile Division Council for adoption as an Indian Standard. The Subcommittee also scrutinized the data collected by members on quality of cotton fabrics manufactured in the country and decided to formulate another Indian Standard on sampling of cotton fabrics for consideration of TDC.

The Subcommittee on Coal Sampling, EC 3:5, formed to scrutinize, from the statistical point of view IS: 436-1953 Tentative Indian Standard Methods of Sampling of Coal and Coke, and IS: 437-1954 Indian Standard Specification for Size Grading of Coal and Coke decided that, before making definite recommendations for amending these standards, further experiments should be conducted on various coals on a uniform basis, so that valid conclusions could be drawn from analysis of the data collected. With that end in view, the Committee has undertaken the design of experiment and manual of instructions for carrying out various surveys at different coal-fields. Some progress was made during the year in this direction.

The Sectional Committee on Methods of Sampling (SMDC 4) set up under the Structural and Metals Division Council (*see item* **2.9**), has made preliminary investigation in formulating standards on sampling on a number of subjects referred to it by the other committees of the Division Council.

iv) *Sampling for Certification Marks Scheme* — The Section continued to collaborate and assist the Marks Division in implementing the ISI Certification Marks Scheme. In this connection, the activities of the Section may be considered under (a) preparation of schemes of routine inspection on sound statistical basis before issuing a licence and (b) statistical analysis of routine inspection data collected on the basis of the scheme by the licensee to ensure continuous conformity to the requirements of the specification.

During the year under review the schemes of inspection for issuing licences were recommended in 18 cases in consultation with the Marks Division. All these schemes were accepted by the licensees to form the basis of inspection for ISI Certification Marks Scheme. The routine inspection data collected from the operation of the inspection scheme was also examined statistically to ensure conformity to specifications. In a number of cases the Marks Division was advised to take necessary action for non-compliance with specification requirements in the factories of the licensees. In addition, some factories of the licensees, such as Estrela Batteries, Bombay, were visited and assisted in the introduction of statistical quality control techniques in their production and inspection process. Assistance was also given to other licensees in introducing quality control techniques and in setting up such departments in the factories.

v) *Miscellaneous* — At the suggestion of the Plastic Moulding Sectional Committee, CDC 17, the Section undertook the task of examining statistically the data collected by the Committee on the quality of moulding powders manufactured in the country for the purpose of specifying the quality limits of various characteristics in Indian Standards under formulation. On the basis of the examination and the results obtained, CDC 17 has since formulated the draft standard for phenol formaldehyde moulding powder.

A statistical survey was designed for the proper choice of pictorial marks for handling instruction of non-dangerous goods [*see also* 2.1.5 (xix)].

Besides dealing with a variety of enquiries by statistical nature, the Section continued to collect and compile statistical data connected with the working of ISI, and to issue a monthly digest of such data for information of the Directorate staff.

2.10 Publications Section — Besides the increasing activity connected with the editing and publishing of Indian Standards and the ISI Bulletin, the year under report saw the production of a thoroughly revised and considerably enlarged ISI Handbook, and of the Report of the Commonwealth Standards Conference.

2.10.1 *New Indian Standards* — The total number of Indian Standards published and under print as on 31 March 1956 was 760 (including 12 revisions). Out of these, one under print was withdrawn by the EDC, thus reducing the number to 759. To this were added another 160 (including

14 revisions) during the year under report, bringing the total number of published and under print standards as on 31 March 1957 to 919. This number includes 26 standards which have been revised and issued as revised standards. Further, five standards have been withdrawn. The number of Indian Standards available on 31 March 1957 thus totals 888. A list of the new 160 Indian Standards, inclusive of those under print on 31 March 1957, is given in Appendix 4.1 (p. 62).

2.10.2 *Revisions* — Of the 160 new Indian Standards, the 14 issued as Revisions were the following:

IS: 15-1956 Specification for Seedlac
IS: 16-1956 Specification for Shellac
IS: 17-1956 Specification for Bleached Lac
IS: 24-1956 Specification for Brazing Solder
IS: 26-1956 Specification for Tin Ingot
IS: 27-1956 Specification for Pig Lead
IS: 189-1956 Specification for Tamarind Kernel Powder for Use in the Cotton Textile Industry
IS: 192-1956 Specification for Silver Solder
IS: 193-1956 Specification for Soft Solder
IS: 209-1956 Specification for Zinc
IS: 225-1956 Specification for Pig Iron (Char Coal)
IS: 275-1957 Specification for Padlocks
IS: 437-1956 Specification for Size Grading of Coal and Coke for Marketing
IS: 456-1956 Code of Practice for Plain and Reinforced Concrete for General Building Construction

2.10.3 *ISI Bulletin* — The bulletin which is published every 2 months, continued to make progress. Apart from increase in its volume and coverage, its circulation increased during the current year from 4400 to 5000. The bulletin is thus proving more and more useful in publicizing the activities of the Institution.

The January 1957 Issue was published as a special number for the third Commonwealth Standards Conference held in New Delhi in Jan-Feb 1957. It included articles on all national standards bodies in the Commonwealth by their respective heads and special articles on the two earlier Conferences and on certain Indian industries, viz, iron and steel, electric cables and machine tools. The Conference itself was covered in the March Issue in which extracts from the Report, supported by suitable photographs, were published.

2.10.4 *List of Indian Standards* — A list of Indian Standards published and under print on 1 April 1956 was brought out in the form of a 10-page pamphlet.

2.10.5 *ISI Handbook* — In view of the large number of Indian Standards issued and the all round expansion in the activities of the Institution, the third edition of the ISI Handbook was issued. The ' ISI Handbook 1957 ' is divided into four parts. Part I contains a brief account of the organization of ISI — its development, membership, procedure for standardization, etc. In Part II are included short reviews of ISI publications, namely ISI Bulletins, Report of ISI Special Committee on Weights and Measures, Annual Reports and in particular brief descriptions of 885 Indian Standards. Part III gives a brief account of the co-operative activity of the national standards bodies of the Commonwealth and the collaborative work carried out at international level. This part also includes reviews of the publications of the International Organization for Standardization and the International Electrotechnical Commission. Alphabetical and classified indexes for convenience of reference constitute Part IV of the Handbook.

2.10.6 *Report of the Commonwealth Standards Conference* 1957 — A fortyfive-page report of the Commonwealth Standards Conference held in New Delhi in January 1957, was published giving a full account of the recommendations made by the conference. The recommendations of the 1951 Conference which were endorsed without alterations were included in an appendix to the Report.

2.10.7 *Press Notes* — In order to keep the general public, as well as industrial, commercial and other interests in the country informed about the activities of the Institution, 215 press notes were issued during the year under report. The press notes received favourable attention from the daily and the weekly press, apart from being widely reproduced in most of the technical, trade and commercial journals in the country.

2.10.8 *Articles and Other Contributions* — A list of articles and papers contributed by the ISI staff during the year to various journals and symposia is given in Table I.

2.10.9 *Library* — The number of standard specifications of various countries catalogued and indexed in the ISI Library exceeded 55 000 on 31 March 1957, while the total number of books including reference books was approximately 3 500. These numbers do not include publications kept for reference at Bombay and Calcutta Branch Offices. The collection of Russian Standards is now complete. Lists of new accessions to the library were published regularly in the ISI Bulletin for information of members and subscribers. Since the month of November 1956, the library is bringing out Lists of latest books added to it every two months. Arranging for translations of some of the standards from French, German, Italian, Japanese, Norwegian, Polish, Spanish and Russian formed a significant feature of the services rendered by the library. The library also collected and supplied information on standardization in India and abroad to meet various enquiries. During the year, exchange of publications was arranged with the Burmese Standards Body. Table II shows the extensions of the library service during the past five years.

During the year under review the library collected sets of standards and publications issued by the following important organizations.

i) *UK*
The British Thompson-Houston Co. Ltd., Rugby, England
Metropolitan-Vickers Electrical Co. Ltd., England

ii) *USA*
American Trucking Association
Antifriction Bearing Manufacturers' Association

TABLE I ARTICLES CONTRIBUTED

Sl No.	Title	Author	Contributed to	Date
1.	Standardization of Paints	Dr. K. L. Moudgill	Paintindia	April 1956
2.	Note on the Work of Standardization of Glass and Ceramic Raw Materials and Glass, Glassware, by the Glassware Sectional Committee (CDC 10)	Shri D. Das Gupta	Indian Ceramics	April 1956
3.	Statistical Approach to Problems of Sampling (or) Statistical Methods in Problems of Sampling	Dr. A. K. Gupta	D.C.M. Technical Conference and Symposium on Testing and Evaluation of Materials at GTH	May 1956
4.	Standardization of Weights and Measures	Shri J. P. Mehrotra and Shri V. B. Mainkar	The Statesman	14 June 1956
5.	Standardization for Industrial Progress	Shri Jainath Kaul	Research and Industry	July 1956
6.	Paper standards and Metric System	Shri V. B. Mainkar and Dr. Krishnamurthy	Indian Pulp and Paper	July 1956
7.	Standardization and Indian Non-Ferrous Metals Industry	Shri M. V. Patankar	The Statesman	13 August 1956
8.	Efficient Use of Steel in India	Shri T. V. Joseph	Journal of Industrial Engineering	September 1956
9.	ISI Certification Marks	ISI	Trade Marks Journal	September 1956
10.	Standardization as an Aid to Productivity	Dr. Lal C. Verman	Radioman	September 1956
11.	National Standards and Telecommunications	Shri S. Srinivasan	Telecommunication Engineer	September 1956
12.	Standards for Radio Industry	Shri S. Srinivasan	Radioman	October 1956
13.	Rice Milling Industry in India	Dr. D. V. Karmarkar	Indian Farming	November 1956
14.	Standardization of Sizes and Qualities of Paper in India	Dr. S. Krishnamurthy	Indian Printer and Stationer	November 1956
15.	The Special Role of Standards as a Link Between Industrial Development and Research in India	Shri T. V. Joseph	Symposium of the National Institute of Sciences	12 December 1956
16.	Statistical Methods in the Work of Standardization	Dr. A. K. Gupta	Twentyfifth Anniversary Celebrations of the Indian Statistical Institute, Calcutta	22 December 1956
17.	Indian Standards Institution—National Standards Body for India	ISI	Dastkar	January 1957
18.	Standards Aid Productivity	Dr. Lal C. Verman	Dastkar	January 1957
19.	Standardization in Dairy Industry	Shri C. N. Modawal	Indian Dairyman	January 1957
20.	On the Power and Application of Certain Distribution — Free Tests	Shri B. N. Singh	Tenth Meeting of Indian Society of Agricultural Statistics	January 1957
21.	Standardization and Development of Brick Industry in India	Shri C. S. Chandrasekhara	Symposium on Brick Manufacture in India organized by National Buildings Organization	15-17 Feb 1957
22.	Standardization and Quality Control	Dr. A. K. Gupta	Lecture delivered to B.L.O's Class of Small Industries Service Institute	26 February 1957
23.	Standardization and Plastics Industry	Dr. K. L. Moudgill	Brochure brought out by NCL of India, Poona	March 1957
24.	Plastics Industry and Research	Dr. Lal C. Verman	Brochure of NCL of India for Symposium	March 1957
25.	Standards for Plastics — Link Between Industry and Research	Shri V. B. Mainkar	High Polymers Symposium at Poona	2-5 March 1957
26.	Standardization of Textile Test Methods	Shri R. S. Prayag	All India Textile Conference — The Textile Association (India) Regd., Kanpur	15-17 March 1957

TABLE II LIBRARY RECEIPTS AND SERVICES

	Year				
	1952-53	1953-54	1954-55	1955-56	1956-57
Standards and Books Accessioned (Totals up to end of the year)	27 083	35 045	41 165	45 840	53 008
Draft Standards Received	1 314	1 463	1 403	1 431	900
Proceedings of First Meetings of Committees Received	79	79	81	41	67
Periodicals Received	175	211	218	235	268
Standards and Draft Standards Loaned and Consulted (approximately)	4 000	10 000	16 500	20 000	30 000
Bibliographies Prepared and Revised	51	44	64	81	70

Appalachian Hardwood Manufacturers
Baking Industry Sanitation Standards Committee
Bausch & Lomb Optical Co.
Crayon, Water Colour Craft Institute
Ford Motor Company
Heating, Piping and Air-Conditioning Contractors
National Association
Indiana Limestone Institute
Lead Industries Association
National Board of Boiler & Pressure Inspectors
National Concrete Masonry Association
National Industrial Sand Association
National Office Management Association
Pipe Fabrication Institute
Radio Corporation of America
Red Cedar Shingle Bureau
Spring Washers Institute
Underwriters' Laboratories

In addition to the several news bulletins, the number of technical-cum-trade journals received in the library, reached the figure of 268. The following 20 journals were added during the year:

1) Coir
2) Eastern Economist
3) Electrical Review
4) Envoy
5) European Technical Digest
6) IABSE Bulletin
7) Indian Builder
8) Indian Electrical News
9) Indian Plastics Review
10) India Quarterly
11) Indian Oilseeds Journal
12) Indian Textile Industry Statistical Bulletin
13) Journal of Industrial Engineering
14) Journal of National Building Organization
15) Journal and Proceedings of Institution of Chemists
16) Monthly Abstract on Statistics
17) Popular Plastics
18) Research and Industry
19) Silk Rayon News Letter
20) Wire Production

The Institution received through the Ministry of Works, Housing & Supply, 48 technical journals from the American Technical Co-operation Mission.

2.11 Certification Marks and Implementation Section — The Certification Marks Scheme of the ISI came into operation on 17 March 1955. The year under report may, therefore, be regarded as the second year of the operation of the scheme. The implementation of Indian Standards continued to be the responsibility of this Section.

2.11.1 *Applications Received* — During the year under report, 68 new applications were received raising the total number of applications to 138. The applications which cover engineering, chemical, metallurgical and building materials, are given in Appendix 4.2 (p. 64). Some applications have been received for classes of products covering more than one standard. Suitable indication has been given in Appendix 4.2 against such Indian Standards which have been grouped with others. The disposal position of the total number of applications received up to 31 March 1957, is as follows:

Licences granted	26
Licences refused	1
Applications under consideration	64
Action deferred on the suggestion of the Development Wing, Ministry of Commerce and Industry	4
Action deferred at the request of the applicants	37
Applications withdrawn	6
	138

2.11.2 Eighteen new licences for using standard marks on goods conforming to Indian Standards were granted during the year under report. The names of the licensees and the products for which the licences were granted are given in Table III.

2.11.3 Under Regulation 8(2) of the ISI Certification Marks Rules, 1955, seven licences were renewed during the year. The names of the licensees and the products for which their licences have been renewed together with the period of validity are given in Table IV.

The question of covering plywood tea-chest under the certification marks scheme was under discussion with the Development Wing, who have set up an inspection organization under the Plywood Industry Voluntary Cess Scheme. The end of the year under review saw some understanding reached between the ISI and the Development Wing. The Development Wing will continue, as heretofore, to inspect the production of various factories and affix the ISI Certification Mark on the production of those factories which obtain a licence from the ISI under the certification marks scheme. Arrangements are under way to declare the Development Wing as ' Competent Authority ' under Section 10 of the ISI Certification Marks Act, 1952.

2.11.4 Action on 34 applications was deferred at the request of the applicants. Reasons for deferring consideration on these applications included:

i) economic conditions, the fees being considered too high,
ii) inability to produce material conforming to relevant Indian Standards,
iii) non-availability of testing facilities for controlling quality of products during the process of manufacture,
iv) absence of a price preference for certified goods, and
v) demand for relaxation by DGS&D of inspection of certified material offered against Government orders.

Suitable action has been taken in all cases where the applicants wanted to defer consideration of their applications. For instance, applicants who had no testing facilities in their own factories have been advised about the establishment of suitable laboratories. Assistance in this connection has been given by providing the applicants with details of the type of equipment needed to suit the individual requirements. Several applicants have

TABLE III LICENCES ISSUED UNDER CERTIFICATION MARKS SCHEME

Licence No. and Date	Name and Address of the Licensee	Period of Validity	Article (Relevant IS: No.)
CM/L-9 11-6-56	M/s. Jeewanlal (1929) Ltd., Madras	14-6-56 to 13-6-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-10 11-6-56	M/s. Jeewanlal (1929) Ltd., Bombay	14-6-56 to 13-6-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-11 11-6-56	M/s. Jeewanlal (1929) Ltd., Calcutta	14-6-56 to 13-6-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-12 24-7-56	M/s. Jayant Metal Mfg. Co., Bombay	1-8-56 to 31-7-57	Hard-Drawn Copper Solid and Stranded Circular Conductors for Overhead Power Transmission Purposes (IS: 282-1951)
CM/L-13 3-9-56	M/s. Lallubhai Amichand Private Ltd., Bombay	6-9-56 to 5-9-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-14 3-9-56	The Metal Rolling Works Private Ltd., Bombay	10-9-56 to 9-9-57	Aluminium Sheets, Strips and Circles — Grade A and B (IS: 21-1953)
CM/L-15 13-9-56	M/s. Khadi & Gramodyog Bhandar, Bombay	2-10-56 to 1-10-57	The National Flag of India (Cotton Khadi) (IS: 1-1951)
CM/L-16 25-9-56	The Kandivli Metal Works, Bombay	27-9-56 to 26-9-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-17 26-9-56	M/s. Madura Metal Products Ltd., Madurai	27-9-56 to 26-9-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-18 27-9-56	M/s. D. Ishwarlal & Co., Bombay	28-9-56 to 27-9-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-19 16-10-56	M/s. Shah Devchand & Co., Bombay	19-10-56 to 18-10-57	Wrought Aluminium Utensils (IS: 21-1953)
CM/L-20 24-10-56	M/s. Shree Digvijay Cement Co. Ltd., Sikka	24-10-56 to 23-10-57	Ordinary Rapid-Hardening and Low Heat Portland Cement (IS: 269-1951)
CM/L-21 3-12-56	M/s. Devidayal Metal Industries (Private) Ltd., Bombay	10-12-56 to 9-12-57	Aluminium Sheets, Strips and Circles, Grade A and B (IS: 21-1953)
CM/L-22 13-12-56	M/s. Devidayal Metal Industries (Private) Ltd., Bombay	17-12-56 to 16-12-57	Wrought Aluminium Utensils, Grade A and B (IS: 21-1953)
CM/L-23 19-12-56	M/s. Deccan Aluminium Stores, Bombay	1-1-57 to 31-12-57	Wrought Aluminium Utensils, Grade A (IS: 21-1953)
CM/L-24 19-12-56	M/s. Light Metal Works, Bombay	1-1-57 to 31-12-57	Wrought Aluminium Utensils, Grade A (IS: 21-1953)
CM/L-25 21-3-57	M/s. Associated Battery Makers (Eastern) Private Ltd., Calcutta	1-4-57 to 31-3-58	Lead-Acid Storage Batteries (Dry Separators) for Motor Vehicles Light Duty (IS: 395-1952)
CM/L-26 21-3-57	M/s. Carew & Co., Rosa (U.P.) Dist. Shahjahanpur	1-4-57 to 31-3-58	Rectified Spirit, Grade A (IS: 323-1952)

TABLE IV LICENCES RENEWED

Licence No. and Date	Name and Address of the Licensee	Period of Validity	Article (Relevant IS: No.)
CM/L-1 8-8-55	The Aluminium Industries Ltd., Kundara	15-8-56 to 14-8-59	Hard-Drawn Stranded Aluminium Steel-Cored Aluminium Conductors for Overhead Power Transmission Purposes (IS: 398-1953)
CM/L-2 7-12-55	The Indian Cable Co. Ltd., Calcutta	1-1-57 to 31-12-57	do
CM/L-3 7-12-55	do	do	Cotton Covered High-Conductivity Annealed Copper Wire (IS: 450-1953)
CM/L-4 7-12-55	do	do	Hard-Drawn Copper Solid and Stranded Circular Conductors (IS: 282-1951)
CM/L-5 7-12-55	do	do	Bare Annealed High-Conductivity Copper Wire for Electrical Machinery and Apparatus (IS: 396-1953)
CM/L-6 7-12-55	do	do	Rubber-Insulated Cables and Flexible Cords for Electrical Power and Lighting (for Working Voltages Up to and Including 11 kV (IS: 434-1951)
CM/L-7 27-12-55	Pioneer Magnesia Ltd., Bombay	1-1-57 to 31-12-57	Magnesium Chloride, Technical (IS: 254-1950)

been advised to improve their process of manufacture in order that the finished product may conform to the relevant Indian Standard.

The question of price preference for Government purchases was taken up with the DGS&D who has agreed that, other things being equal, a preference could be given to certified goods, but there was no possibility of giving any price preference. It was also not possible for the DGS&D to accept certified goods without regular inspection owing to certain contractual obligations. In course of time if the manufacturers were found to maintain the standard, the intensity of sampling and inspection could be reduced.

2.11.5 *Exemptions* — Under the conditions stipulated in Rule 14 of the Indian Standards Institution (Certification Marks) Rules, 1955, and under the powers delegated by the EC, the

Director has exempted the name and trade mark of M/s Indian Smelting and Refining Co. Ltd., Bombay, from the purview of section 6 of the Indian Standards Institution (Certification Marks) Act, 1952, which prohibits the use of certain names, marks or trade marks without the permission of the Institution.

2.11.6 *Enquiries for Certification Marks* — As a result of our approach to various manufacturers during the year under review, 111 firms showed interest in the certification marks scheme, and a fair proportion of them ultimately sent their applications for licence to use the ISI Standard Mark. A break-up of their interests is given below:

a) Engineering	34
b) Metallurgical	31
c) Building	14
d) Chemical	20
e) Textile	9
f) Agricultural & Food Products	5

2.11.7 *Standard Marks* — Standard marks in respect of the articles covered by the nine Indian Standards listed in Table V were specified and published in the Gazette of India during the year under report. A typical standard mark is reproduced below:

The monogram of the Indian Standards Institution, consisting of letters ISI, drawn in the exact style and relative proportions, the number designation of the Indian Standard being inscribed in the top side of the monogram as indicated in the design.

The total number of standard marks so far fixed for articles covers 17 Indian Standards.

2.11.8 *Marking Fees* — The rates of marking fees in respect of products covered by nine Indian Standards were determined and published in the Gazette of India, Part II, Section 3. The rates of marking fees so determined and gazetted are given in Table VI. Including these, marking fees have so far been fixed in respect of articles covered by 16 Indian Standards.

2.11.9 *Gazette Notifications Issued* — As required under the ISI (Certifications Marks) Act, 1952, and the rules and regulations framed thereunder, 46 gazette notifications were issued relating to the establishment of Indian Standards and issue of amendment, errata and corrigenda slips to the published Indian Standards. Another 25 gazette notifications were issued relating to the grant and renewal of licences and for the purpose of publication of standard marks and marking fees for various articles covered by published Indian Standards.

2.11.10 *Testing Facilities* — It was mentioned in the report for the last year that a provisional list of laboratories had been prepared for the purpose of the certification marks work. In order that the ISI may have on its record as much information as possible about the testing facilities available in the various laboratories provisionally approved for the purpose of certification marks scheme, the Technical Officers (Marks) have been instructed to visit the laboratories personally whenever they were touring the area concerned. Of the 41 laboratories on the list, 12 have been so visited. Useful information in regard to various types of testing equipment and apparatus available in different laboratories is being collected.

2.11.11 *Certification Marks Advisory Committee* — A significant step towards promoting the use of the standard certification marks was taken by the formation during the year under review of a Certification Marks Advisory Committee which has been established to assist and advise the Institution on matters relating to the working of the ISI (Certification Marks) Act, 1952, and the rules and regulations made thereunder. This Committee held its first meeting on 14 January 1957. Apart from noting the progress of the certification marks scheme, the Committee considered a number of questions. Among others, an important recommendation made by the Committee was that, in the ISI standardization programme, products of protected industries should be given preference and that the ISI Directorate should approach the

TABLE V ARTICLES COVERED BY SPECIFIED STANDARD MARKS

Sl No.	Product/Class of Product	No. and Title of the Relevant IS: No.	No. and Date of the Gazette Notification
i)	Wrought Aluminium Utensils — Grade A	IS: 21-1953 Wrought Aluminium for Utensils	SRO 1012 dated 28-4-56
ii)	Wrought Aluminium Utensils — Grade B	do	do
iii)	Aluminium Sheets, Strips and Circles — Grade A	do	SRO 2049 dated 15-9-56
iv)	Aluminium Sheets, Strips and Circles — Grade B	do	do
v)	The National Flag of India (Cotton Khadi)	IS: 1-1951 The National Flag of India (Cotton Khadi)	SRO 1254 dated 2-6-56
vi)	Ordinary Rapid-Hardening and Low Heat Portland Cement	IS: 269-1951 Ordinary, Rapid-Hardening and Low Heat Portland Cement	do
vii)	BHC Dusting Powders	IS: 561-1955 BHC Dusting Powders	SRO 3088 dated 22-12-56
viii)	BHC Water Dispersible Powder Concentrates	IS: 562-1955 BHC Water Dispersible Powder Concentrates	do
ix)	DDT Dusting Powders	IS: 564-1955 DDT Dusting Powders	do
x)	DDT Water Dispersible Powder Concentrates	IS: 565-1955 DDT Water Dispersible Powder Concentrates	do
xi)	Rectified Spirit	IS: 323-1952 Rectified Spirit	SRO 907 dated 23-3-57
xii)	Lead-Acid Storage Batteries for Motor Vehicles, Light Duty	IS: 395-1952 Lead-Acid Storage Batteries for Motor Vehicles, Light Duty	do

TABLE VI MARKING FEE LEVIED UNDER THE CERTIFICATION MARKS SCHEME

Product/Class of Products	Unit	Marking Fee per Unit	No. and Date of the Gazette Notification
The National Flag of India (Cotton Khadi)	*One square foot *One Flag	Re -/-/1 Re -/-/3	SRO 1255 dated 2 June 1956
Ordinary, Rapid-Hardening and Low Heat Portland Cement	One thousand tons	Rs 12/-	do
Wrought Aluminium Utensils — Grade A and Grade B	One ton	Rs 2/-	SRO 1319 dated 9 June 1956
Aluminium Sheets, Strips and Circles — Grade A and Grade B	One ton	Rs 2/-	SRO 1992 dated 8 September 1956
BHC Dusting Powders	One ton	Re 1/-	SRO 3089 dated 22 December 1956
BHC Water Dispersible Powder Concentrates	One ton	Rs 2/-	do
DDT Dusting Powders	One ton	Rs 2/-	do
DDT Water Dispersible Powder Concentrates	One ton	Rs 5/-	do
Rectified Spirit	One thousand bulk gallons	Rs 8/- per unit for the first 200 units Rs 6/- per unit for the next 300 units Rs 4/- per unit for the 501st unit and over	SRO 907 dated 23 March 1957
Lead-Acid Storage Batteries for Motor Vehicles, Light Duty	One battery	Re -/2/- per unit for the first 30 000 batteries or part thereof with a minimum of Rs 2 500/- Re -/1/- per unit for the 30 001st battery and over	do

*Square footage basis for all flags except motor car flag, and unit flag basis for motor car flag.

Tariff Commission for popularization of the certification mark in protected industries.

2.11.12 *Implementation of Indian Standards* — Implementation of Indian Standards by manufacturers and consumers, though voluntary, has shown a marked progress. Realizing the great advantage of production and use of standard goods, manufacturers — private and state consuming bodies — have been expressing greater desire to follow Indian Standards.

During the year under review as many as 374 Indian Standards were formally adopted by one or more of the purchasing organizations of the Central Government. A detailed list of standards adopted during the year under review by various organizations is given in Appendix 4.3. At the end of the last financial year, out of a total of 733 Indian Standards issued, 564, i.e. nearly 77 percent, had been adopted by one or more of the purchasing departments. This year, of the total of 838 Indian Standards printed by 31.3.1957, 757, i.e. 90 percent, had been adopted. The exact position regarding the adoption of Indian Standards by various organizations for the two consecutive years is given below:

Name of the Organization	*Number of Indian Standards Adopted*	
	March 1956	March 1957
Central Standards Office	214	408
Directorate General of Armed Forces Medical Services	12	12
Directorate General of Ordnance Factories	245	246
Directorate General of Supplies & Disposals	505	611
Directorate of Technical Development (MGO Branch, Army Headquarters)	252	396
Posts & Telegraphs Department	10	10
Directorate of Cottage Industries, Uttar Pradesh	1	1
Textile Commissioner to the Government of India	1	1
Ministry of Home Affairs	1	1
Directorate of Marketing & Inspection, Ministry of Food & Agriculture	3	3
Ministry of Food & Agriculture	1	1
Kerala Government	0	1

Besides, the Ministry of Transport (Roads Wing) have intimated that all Indian Standards published during the year 1954-55 and 1955-56 have been accepted by them and that they would follow these standards provided they did not come in conflict with that Ministry's special requirements.

The following parties have also intimated their acceptance to follow Indian Standards in their purchases:

Government of Uttar Pradesh
Government of West Bengal
Government of Mysore
Bombay Port Trust
Bombay Electricity Board

The ISI continued its drive for promoting adoption of Indian Standards. The steps worth mentioning in this regard are the following:

i) Specific cases where the purchasing organizations of the Centre and the States have omitted a reference to the related Indian Standard in their tender enquiries, are brought to the notice of the authorities concerned in order that future tender enquiries for articles for which Indian Standards exist may explicitly ask tenderers to quote for material conforming to Indian Standards.

ii) Large-scale manufacturers of electrical equipment, handloom cloth, textiles, office stationery, sanitary appliances, bitumen and tar products and timber products have been individually approached to implement Indian Standards in their manufacturing programme.

iii) Nearly two thousand small manufacturers were requested by the Development Wing of the Ministry of Commerce & Industry to implement Indian Standards in their programme of manufacture and also to take advantage of the ISI certification marks scheme.

iv) ISI had been receiving requests from Government Departments, ISI members and others asking for names of firms who could manufacture and supply various articles in accordance with Indian Standards. In order to adequately and properly reply such enquiries, the ISI collected, in the year under review, some information which shows that out of the members of the ISI, there were 186 manufacturers producing goods in accordance with Indian Standards. Data from other manufacturers is still being received. Fifty-two parties stated that they were buying all their requirements in accordance with the relevant Indian Standards.

The steps taken have proved fruitful in promoting the adoption of Indian Standards inasmuch as there is an assurance from the industry in general, and consuming departments and purchasing organizations of the Government in particular to follow Indian Standards in their programmes of manufacture and purchase.

2.12 Public Relations — The public relations activities of the ISI can be stated to be directed towards three groups of people, namely (i) ISI members who include subscribing members and members of ISI councils and committees, (ii) the technical and scientific personnel, and leading industrial and commercial houses, and (iii) the general public. The ISI members and the technical and scientific personnel are continually kept informed of the technical work by circulation of drafts and printed standards, ISI Bulletin and other information, and also by publication of articles and reviews in the technical, trade and industrial journals of the country, from which the general public also derives knowledge about the ISI. The press notes issued about the draft Indian Standards circulated, standards published and other important events in the ISI acquaint the public about the ISI's work and its contribution to national development. The conventions and conferences convened by the ISI have also succeeded in creating awakening and standards consciousness in the minds of the industrialists and the general public.

2.12.1 *Membership* — Notable progress was made during the year in the enlistment of new members. The accessions to membership are a record for any year to date. Altogether 234 new members were enrolled during the calendar year 1956 against the previous year's 191. On 31 March 1957, the net membership was 1347 as against the previous year's figure of 1181. The figure for sustaining members including associates rose from 1098 to 1251, and the ordinary membership increased from 83 to 96.

The detailed analysis of gains and losses in the three categories of membership and the membership position as on 31 March 1957 is given in Table VII. Figure 3 shows the growth of membership during the past several years.

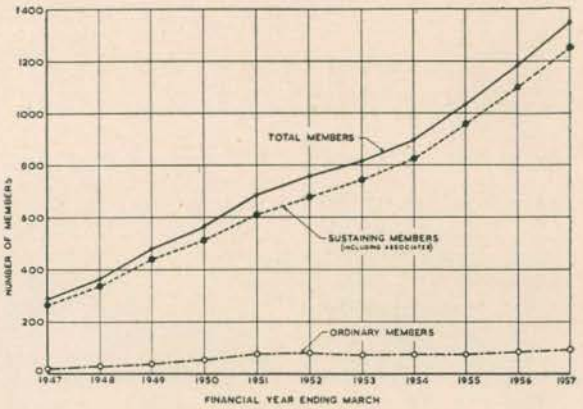

FIG 3 GROWTH OF MEMBERSHIP

During the year under review, 190 sustaining members and sustaining members (associates) and 20 ordinary members either resigned their membership or failed to remit their dues by 30 June, the date set under the constitution for payment of dues. The Membership Section was, however, able to pursuade 131 sustaining members and associates and 11 ordinary members to renew their subscription. The end of the year, therefore, showed a loss of 59 sustaining members and associates and 9 ordinary members from 1956-57 roster. This loss was, however, made up by the admission of 234 new subscribing members. On 31 March 1957, therefore, the membership roster recorded an addition of 166 subscribing members.

The revenue obtained from subscribing members during the year 1956 set a new record by reaching a figure of Rs 3·36 lakhs against 1955 collection of Rs 3·02 lakhs. Over one hundred sustaining members paid more than the minimum contribution; the maximum being Rs 10 000/- (*see* Appendix 4.4).

2.12.2 *Sale of Standards* — During the year under report, the Sales Section handled over 10 000 orders for supply of ISI publications as also those of BSI, ASA, ASTM, ISD, IRS, ISO, IEC, and of some other countries. It may also be noted that at present there are some 140 standing orders for supply of all Indian Standards as they become available. Sale of Indian Standards totalled Rs 82 004 as against Rs 70 758 of last year. The progressive sale of standards during

TABLE VII MEMBERSHIP ANALYSIS (1956-57)

Class of Membership	Number of Members on		Losses Due to			Additions by			Net Gain
	1 April 1956	31 March 1957	Resignation	Lapsing	Total	Admission	Reinstatement	Total	
Sustaining Members	988	1 118	*38	127	165	177	118	295	130
Sustaining Members (Associates)	110	133	7	18	25	35	13	48	23
Ordinary Members	83	96	6	14	20	22	11	33	13
Total	1 181	1 347	51	159	210	234	142	376	166

*This includes seven States which do not now exist on account of reorganization.

the last nine years is illustrated in Fig 4. The sale of overseas standards totalled Rs 86 773 as against last year's total of Rs 90106/-.

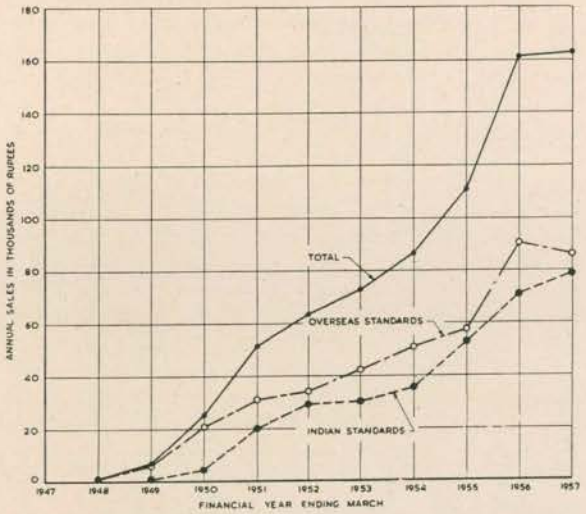

Fig 4 Growth of Sale of Indian and Overseas Standards

Selling Agencies — During the year, the ISI, took over the selling agencies of Japanese Standards Association and ISO. The ISI now holds selling agencies of the following 12 organizations:

Overseas Agencies

1) British Standards Institution
2) Standards Association of Australia
3) American Standards Association
4) American Society for Testing Materials
5) Institution of Civil Engineers, etc, UK (Codes of Practice only)
6) International Organization for Standardization
7) International Electrotechnical Commission
8) Japanese Standards Association (English Editions only)

Indian Agencies

1) Central Standards Office, Railway Board (IRS Specifications)
2) Directorate General of Supplies & Disposals (DGS&D Specifications)

It has been observed that the demand for ISI specifications is growing in other countries particularly in Pakistan, Ceylon, Burma, Germany and Japan.

Distribution of ISI Publications — Over 1·80 lakh copies of ISI publications, which comprise published standards, ISI Bulletin and Annual Report, were supplied free of cost to subscribing members, committee members, government departments, CSIR laboratories, overseas standards bodies, etc.

2.12.3 *Building Fund* — The Building Fund contributions, as on 31 March 1957, amounted to Rs 11·11 lakhs which included a few promises for cash and material and the reserve of Rs 1·78 lakhs. The industry-wise analysis of the total contributions is given as under:

Industry	*Target Set (Rs in lakhs)*	*Amount Paid (Rs in lakhs)*	*Promises (Rs in lakhs)*	*Total (Rs in lakhs)*
(1)	(2)	(3)	(4)	(5)
Building	1·00	0·26	0·07	0·33
Cement	1·00	0·55	0·05	0·60
Chemicals	1·00	1·19	0·08	1·27
Coal	0·50	0·24	0·02	0·26
Electrical Undertakings	0·50	0·10	—	0·10
Engineering	1·00	1·37	0·21	1·58
Jute	0·50	0·56	—	0·56
Iron and Steel	1·00	1·21	—	1·21
Paper	0·50	0·13	—	0·13
Silk and Art Silk	0·50	0·05	—	0·05
Sugar	1·00	0·20	—	0·20
Tea	0·50	0·55	—	0·55
Textiles (Cotton and Woolen)	2·00	1·32	—	1·32
States	—	0·52	0·20	0·72
Others	—	0·44	0·01	0·45
Total	11·00	8·69	0·64	9·33

It was decided to erect in a prominent place such as the entrance hall or the museum of the building, an inscription giving the names and contributions of those who paid Rs 5 000/- and above.

The ISI is grateful to the members of the Building Fund Committee, who under the chairmanship of Shri Tulsidas Kilachand, have been instrumental in collecting, against an appeal for Rs 10 lakhs, a sum of Rs 9·33 lakhs which together with a reserve fund and the Government grant, has helped the Institution to have its own home.

2.13 Administration Section

2.13.1 *General Council (GC)* — The General Council held its twelfth meeting on Thursday, 28 March 1957, at the ISI headquarters, with Shri Morarji Desai, President, ISI, in the chair. The Council adopted the Annual Report of the Institution for the year 1955-56 and approved the revised budget estimates for the year 1956-57 and budget estimates for 1957-58 with a few alterations.

The Council adopted certain amendments to the ISI Constitution as necessitated by the reorganization of the States of India and others of administrative nature.

The Council unanimously re-elected Lala Shri Ram and Shri E.A. Nadirshah as Vice-Presidents for the year 1957-58.

The question of preparation of Indian Standards for general conditions of contracts for civil engineering works was debated and the Council decided that the matter should be postponed *sine die*, but statistics should be collected in the meantime from other countries, where the contractual forms of agreement had been issued by the national standards organizations, about popularity of such forms and the percentage of contracting parties who were following them. The statistics so collected, it was agreed should be submitted to the President, ISI, together with copies of standard forms of contract.

2.13.2 *Executive Committee* — The Executive Committee met five times during the year to deal with general administrative matters. It also took decisions on matters referred to it by the various division councils and other technical sections.

Some of the noteworthy decisions taken by the EC during the period under review included the re-election of Lala Shri Ram as chairman for the year 1957-58; adoption of ISI service cadre rules; amendments to ISI bye-laws and CPF rules; adoption of the plan for introduction of metric system in Indian Standards; setting up of a Certification Marks Advisory Committee to assist the Institution in promoting the use of standard certification marks and to advise on matters relating to the working of the Act, rules and regulations; provision of travelling facilities to the employees during regular leave; increase in annual grant for provision of amenities to staff; holding of the next standards convention and opening of a Branch Office at Madras.

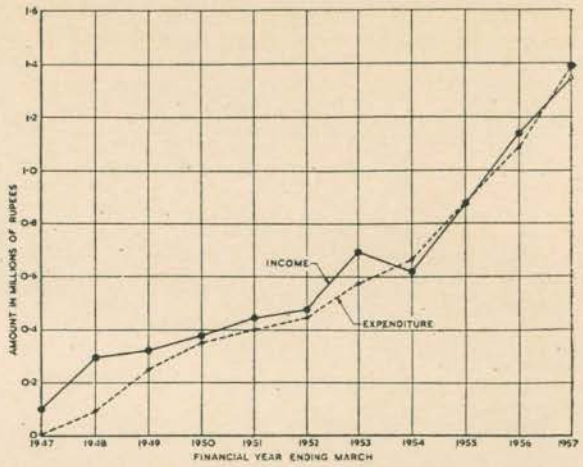

FIG 5 GROWTH OF INCOME AND EXPENDITURE

2.13.3 *Finance Committee* — The Finance Committee held five meetings during the year; one meeting separately and four jointly with the Executive Committee.

The total income of ISI in 1956-57 from its normal sources, i.e. membership subscription, sale of standards, certification marks, fees, etc, including contribution from the Government of India, was Rs 13·47 lakhs against the anticipated budget figure of Rs 14·54 lakhs. Against the estimated budgeted expenditure of Rs 15·37 lakhs, the amount spent was Rs 13·94 lakhs. The indirect contribution during the year by Government and private organizations by way of expenditure incurred by members travelling to attend meetings of the ISI within India and abroad is estimated to be about Rs 4·27 lakhs. Certified statements of accounts for the year under report are given in Appendix 4.5 (p. 76).

2.13.4 *ISI Staff* — During the year, 52 new members joined the ISI staff, thereby raising the total strength to 270. The Standing Selection Committee which is responsible for selecting officers met six times and the five Staff Selection Committees appointed by Director for selection of junior staff held 25 meetings during the year under report.

New appointments, promotion, officiating arrangements and other changes that occurred during the year in the staff are given in Table VIII.

The staff position as on 31 March 1957 is indicated in Table IX.

TABLE VIII CHANGES IN ISI STAFF

Sl No.	Name	Designation	Division or Section	Date of			Remarks
				Joining	Promotion	Release	
1.	Shri P. C. De	Technical Translator	Publications	2-4-56	—	—	New appointment
2.	Shri M. .V. Patankar	Assistant Director	Engineering	—	24-4-56	—	Promotion from Technical Officer (Marks)
3.	Dr. A. N. Ghosh	Joint Director	—	24-9-56	—	—	New appointment
4.	Shri S. P. Raman	Technical Officer	Building	26-12-56	—	—	New appointment
5.	Dr. Sadgopal	Deputy Director	Chemicals	12-3-57	—	—	New appointment vice Dr. K. L. Moudgill

TABLE IX STAFF POSITION ON 31 MARCH 1957

Designation	No. of Posts		
	Sanctioned	Filled	Vacancies
Director	1	1	—
Joint Director	1	1	—
Deputy Director	5	5	—
Officer-on-Special Duty	1	1	—
Assistant Director	11	8	3
Chief Editor	1	1	—
Secretary	1	1	—
Technical Officer	20	16	4
Engineer Draftsman	1	1	—
Translator	2	2	—
Extra Assistant Director (Probationer)	19	—	19
Section Officer	5	5	—
Librarian	1	1	—
Technical Assistant	15	13	2
Clerical Staff	153	151	2
Others (Peons, etc)	66	63	3
Total	303	270	33

TABLE X DRAFT STANDARDS AND PROCEEDINGS OF THE FIRST MEETINGS RECEIVED FROM COMMONWEALTH AND OVERSEAS COUNTRIES

	Drafts	Proceedings of First Meeting
Australia	17	9
Belgium	36	—
Chile	29	—
Denmark	7	—
Eire	3	1
France	—	—
Germany	1 127	—
Israel	21	—
New Zealand	12	2
Pakistan	—	1
South Africa	27	—
United Kingdom	245	55
Yugoslavia	159	—
Total	1 683	68

3. STANDARDIZATION ABROAD AND AT INTERNATIONAL LEVEL

3.1 Relations with Other National Standards Authorities — The ISI continued to maintain, during the year under review, cordial and co-operative relations with the various national standards bodies of the commonwealth and other countries and thus helped to prepare the ground for international co-operation in the field of standardization for which the member countries belonging to ISO and IEC are working.

The number of draft standards and proceedings of the first meetings received during the year is recorded in Table X. Numerous documents of similar nature received from the ISO, the IEC and their technical committees are not included in this table. Several of these draft standards and minutes were circulated to interested members of ISI committees and to trade interests concerned. Comments received were passed on to the national standards bodies issuing the drafts.

The ISI also sent out 252 draft Indian Standards and proceedings of 17 first meetings to other countries.

3.2 International Organization for Standardization — The Institution represents India as a founder member of the International Organization for Standardization, participates in 56 of its 85 technical committees and carries the secretariats of two technical committees and one subcommittee.

Various meetings of the ISO technical committees were held during the period under review and are given below in detail along with the names of Indian delegates sent to these meetings:

ISO MEETINGS

Sl No.	*Name of Delegate*	*Meeting*	*Venue*	*Date*
1.	Shri R. L. Acharya	ISO/TC 24 — Sieves	Dusseldorf	26-29 Jun 1956
2.	Dr. J. S. Aggarwal	ISO/TC 78 — Aromatic Hydrocarbons	London	19-21 Mar 1957
3.	Shri V. K. Ahuja	ISO/TC 65 — Manganese	Leningrad	21-25 Aug 1956
4.	Shri C. S. Chandrasekhara	ISO/TC 24 — Sieves	Dusseldorf	26-29 Jun 1956
		ISO/TC 30/SC 1 — Liquid Flow Measurements Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956
5.	Shri S. K. Chowdhury	ISO/TC 61 — Plastics	The Hague	17-22 Sep 1956
6.	Shri T. R. Doraswamy	ISO/TC 28 WG/1 — Working Group on Terminology of ISO/TC 28 Petroleum Products	Paris	15 Nov 1956
7.	Mr. G. W. Golding	ISO/TC 4 — Ball and Roller Bearings	Vienna	24-27 Sep 1956
8.	Mr. M. C. Hall	ISO/TC 78 — Aromatic Hydrocarbons	London	19-21 Mar 1957
9.	Mr. D. A. James	ISO/TC 29 — Small Tools	Paris	22-25 Oct 1956
10.	Shri T. V. Joseph	ISO/TC 17 — Steel	London	4-7 Mar 1957
11.	Shri Kanwar Sain	ISO/TC 30/SC 1—Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956

Sl No.	Name of Delegate	Meeting	Venue	Date
12.	Shri K. N. Kathpalia	ISO/TC 30/SC 1—Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956
13.	Dr. S. Krishna	ISO/TC 78—Aromatic Hydrocarbons	London	19-21 Mar 1957
14.	Shri Madanjeet Singh	ISO/TC 47 — Chemistry	Sirmione (Italy)	1-4 Oct 1956
15.	Shri L. T. Madnani	ISO/TC 17 — Steel	London	4-7 Mar 1957
16.	Shri Maharaj Kishen	ISO/38 — Textiles	Southport (England)	15-18 May 1956
		ISO/TC 38/SC 5 — Yarn Testing	do	14-17 May 1956
		ISO/TC 38/SC 6 — Fibre Testing	do	11-12 May 1956
17.	Dr. A. K. Mallik	ISO/TC 17 — Steel	London	4-7 Mar 1957
18.	Shri N. V. Modak	ISO/TC 30/SC 1 — Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956
19.	Shri V. K. V. Narasimham	ISO/TC 30/SC 1 — Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	
20.	Dr. S. R. Ranganathan	ISO/TC 46 — Documentation	Stuttgart	30 Aug to 1 Sep 1956
21.	Shri S. G. Ramachandran	ISO/TC 6 — Paper	Paris	5-7 Dec 1956
22.	Shri S. K. Roy	ISO/TC 30/SC 1—Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956
23.	Shri M. L. Shroff	ISO/TC 38 — Textiles	Southport (England)	15-18 May 1956
		ISO/TC 38/SC 5 — Yarn Testing	Southport	14-17 May 1956
24.	Shri G. Sukumaran	ISO/TC 71 — Concrete and Reinforced Concrete	Vienna	9-10 Oct 1956
25.	Dr. H. L. Uppal	ISO/TC 30/SC 1 — Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956
26.	Dr. Lal C. Verman	ISO/TC 22 — Automobiles	London	11-26 Jun 1956
		ISO/TC 30/SC 1 — Liquid Flow Measurement Through Open Channels	Munich	9-11 Jul 1956
		ISO/TC 30 — Measurement of Fluid Flow	do	12-14 Jul 1956
27.	Shri S. Viswanathan	ISO/TC 17 — Steel	London	4-7 Mar 1957
28.	Dr. J. W. Whitaker	ISO/TC 27/ WG 8 — Working Group on Physical Testing of Coke of ISO/TC 27	London	11-13 Jun 1956

Besides, Dr. Verman, Director ISI, also attended the annual meetings of ISO Council and meetings of several administrative committees set up by the ISO Council for specific purposes. He also visited Belgian, French and UK Administration of Weights and Measures and held discussions with BSI and standards institutions of Belgium, France and Ireland in connection with several questions of common interest.

Detailed reports by various delegations on the progress made at various meetings were submitted to the different sectional committees concerned with the deliberations and taken into account in laying down national standards. A brief report of the work of each of the ISO Committees which held meetings during the period under review together with those for which India holds the secretariat, is given below. The work of committees in which India had made some contribution is also included.

3.2.1 *ISO Council* — One of the important decisions taken at the annual meeting of the ISO

Council held in Geneva from 16 to 21 July 1956 was on initiation of standardization in the field of atomic energy for an ordered development of standards in this rather new field. A Technical Committee ISO/TC 85 — Nuclear Energy was set up for the purpose and the Council also approved a statement prepared by PLACO to be addressed to the United Nations Organization jointly by ISO and the IEC (*see* 3.2.2).

Among the new proposals considered, the subject of medical syringes of hypodermic needles proposed by the French Member Body was approved and alloted to a new Sectional Committee (ISO/TC 84) established for the purpose. Two more subjects, namely apparatus for testing milk and milk products, and refrigeration, were reported to be in the process of submission to the Council.

In this connection, the Council decided that in future any proposals for the study of a new question should be submitted to the PLACO at the same time as to the member bodies. The PLACO will also receive a summary of the replies sent in by the member bodies. The recommendation of PLACO will be attached to the proposal which would be submitted to the members of the Council for decision.

The activities of the IEC on the subject of atmospheric conditioning were referred to the Council and it was reported that the IEC would very much like to have some interested secretariats of its own committees represented on ATCO which is the co-ordinating committee set up by ISO Council for the purpose. It was confirmed that this gesture of IEC would be an encouragement and would give an impetus to the work of ATCO.

Besides, the ISO Council considered reports and further programmes of work submitted by the Planning Committee (PLACO), Committee on Directives (DICO), Standing Committee for the Study of Scientific Principles of Standardization (STACO), the ISO Working Group on Agricultural Products, together with reports submitted by the ISO General Secretary, and made appropriate recommendations.

India was represented at the Council meeting by Dr. Verman and Shri C. S. Chandrasekhara, Deputy Director (Building).

3.2.2 *ISO Planning Committee (PLACO)* — The PLACO having been formed in 1954 under the chairmanship of Dr. Lal C. Verman, was entrusted with the task of reorganizing the work of various ISO technical committees in related fields, so as to eliminate duplication and overlapping. The third meeting of this Committee was held at Geneva on 15 July 1956 and was attended by Dr. Verman. The meeting discussed, among other things, a specific case put to it with regard to overlapping that had occurred among the respective scopes of ISO/TC 5 — Pipes and Fittings, ISO/TC 11 — Unification of Boiler Codes and ISO/TC 17 — Steel. The scope of work proposed by the Secretariat of ISO/TC 5 was circulated by the chairman of PLACO to the Secretariat of 13 related committees, inviting their views and possible solutions they could recommend. From the comments received, a comprehensive statement was prepared by the chairman, summarizing the position of liaison and scopes of work of various ISO technical committees in relation to those of ISO/TC 5 and this statement formed the basis for discussion at the meeting.

Taking into consideration the suggestions made by AFNOR and BSI, PLACO evolved a suitable plan differentiating the technical committees dealing with semi-finished or finished products on the one hand and standardization of materials used in these products on the other. Adopting certain general principles for guidance in such cases, the scope of ISO/TC 5 was finally revised.

Among other matters considered at this meeting, the subject of standardization in the field of atomic energy requires special mention, in view of its gaining importance at the international level. The proposal which originated from Sir Roger Duncalfe (President of ISO) at the recent meeting of International Electrotechnical Commission (IEC) held at Munich, was fully discussed by PLACO and a statement to be addressed to the United Nations under the joint auspices of ISO and IEC was prepared and submitted to the ISO Council for approval (*see* also 3.2.1). The statement drew the attention of the United Nations to the institution of a programme of standardization in the field of nuclear energy by the ISO and IEC with the necessary co-operation of other international organizations more or less directly interested in these problems. The statement gave a list of principal subjects envisaged to be included in the programme like terminology, definitions and symbols, protection of persons against hazards from nuclear radiation, safe and effective operation of reactors, materials for nuclear energy, methods of tests for impurities, etc.

The rest of the items dealt with by PLACO related to matters like (i) the procedure followed in preparing the ISO recommendations, (ii) the question of providing opportunity for mutual consultation between technical committees interested in a particular draft ISO recommendation before the same is passed on to General Secretariat for circulation to all member bodies and (iii) the possibilities of holding group meetings of committees with contiguous spheres of work.

Subsequent to this meeting, PLACO had done considerable work during the period under review. Having been assigned the responsibility of recommending on new proposals for standardization submitted to ISO (*see* also 3.2.1), PLACO considered proposals on cork, pictorial marking and handling instructions of non-dangerous goods, saws and sawing machines, nuclear energy, fibre building board. Appropriate recommendations were made to the ISO council for taking up these subjects.

3.2.3 *Standing Committee for the Study of Scientific Principles of Standardization (STACO)* — This Committee, which can be called a research body under the aegis of the ISO Council has its primary duty to advise the Council on principles, methods and procedures necessary to achieve optimum standardization.

Questions concerning the application of numerical series in standardization were discussed at the fourth meeting of the Committee held at Cambridge from 18 to 22 June 1956. In this connection, a number of documents, such as on roller bearings, gear pitches and screw threads had been examined in its previous meeting at Milan, and it was felt that a single standard series for gears, screw

threads, etc, would be of great help in solving many complications. Having further deliberated in this meeting on the question of application of numerical series in international standardization, it was decided to recommend to the Council the use of Reynard series of preferred numbers according to ISO Recommendation No. 3 as far as possible, and to reorganize the difference between the standardization of ranges of nominal independent values and of ranges of values which depend on such nominal values. When it is not possible to apply these basic series in certain cases, say for values depending on the range of nominal independent values, use of shifted basic series or derived basic series, or a combination of these two was recommended.

This Committee also discussed an item of great interest from the Indian point of view, concerning the Indian Standard Guide for Inter-Conversion of Values from One System of Units to Another (IS: 787-1956). STACO having discussed this draft, recommended to the Council that such a study of question of procedure for conversion of values from one system of units to another on the basis of conversion factors given by ISO/TC 12 quantities, units, symbols, conversion factors and conversion tables be referred to ISO/TC 12 with a view to evolving an ISO recommendation.

STACO made it clear that international standardization would be facilitated if a clear distinction were made between standardization of characteristics of products and the expression of such characteristics in different systems of units of measurements. An object of dimensional standardization is to achieve functional interchangeability.

The meeting was attended by Dr. Verman.

3.2.4 *ISO Agricultural Working Group* — It will be recalled that the ISO Council had established in 1955 a working group comprising France, India, Italy and the USSR to study the question of reorganization of the work of ISO/TC 34 Agricultural Products. At the national level, the AFDC in its first meeting held on 18 Feb 1956 set up a corresponding ISI working group for taking part in the international activity.

The first meeting of the ISO Working Group was held at Geneva on 16 and 18 July 1956. A note prepared earlier by ISI concerning reorganization of ISO/TC 34 was considered. Dr. Verman, who represented India at this meeting, elucidated the various factors and the present status of the standardization work in various countries.

The meeting, though it agreed with the views placed before it by Dr. Verman, was of the opinion that the time was not yet ripe for taking up this work on a comprehensive scale, and decided to make a beginning in a limited field within the existing framework of the ISO, as an experimental measure.

3.2.5 *ISO/ECAFE Liaison* — Dr. Verman, Director ISI, was appointed as ISO Liaison Officer to the ECAFE by the ISO Council in its meeting held in 1955. Since then some progress has been made in getting the ECAFE countries better informed and interested in the work of international standardization.

The facts that the ECAFE was represented by an observer in the recent Commonwealth Standards Conference in New Delhi and the Burmese Government is getting interested in setting up a standards-body, bear testimony to the increased interest that is developing in standardization in the ECAFE region.

3.2.6 *ISO/UNESCO Liaison* — Dr. Verman represented ISO at the Ninth General Conference of UNESCO held in New Delhi from 5 November to 5 December 1956. The ISO is one of the Non-Governmental organizations approved for consultative arrangement with UNESCO.

3.2.7 *ISO/TC 4 — Ball and Roller Bearings* — The subjects discussed at the fifth meeting of this Committee at Vienna (Austria) on 24-27 September 1956, principles of standardization, tapered roller bearings, identification code, tolerances, internal bearing clearance, instrument bearings, snap ring groove bearing, aircraft bearing, load carrying capacity, separate thrust shoulders for cylindrical roller bearings, plummer blocks and simplified drawings for ball and roller bearings.

Mr. G. W. Golding of the National Bearing Co., Ltd., Jaipur, attended the meeting as observer.

3.2.8 *ISO/TC 6 — Paper* — The Committee which met in Paris from 5-7 December 1956 approved the proposed draft ISO recommendation relating to widths of sheets of paper (210± 2 mm) for circulation as draft ISO recommendation. It may be mentioned here that India has adopted as national standards the 'A' series of ISA, the predecessor of ISO, and the size 210 mm is width of one such size. The ISO/TC 6 set up a new Subcommittee on Manufactured Packages of Paper and Board with UK as the secretariat to undertake the study of (i) terminology, (ii) test methods, (iii) dimensions and (iv) specifications of manufactured packages. The work assigned to the Subcommittee on Test Methods and Quality Specifications was extended to include the study of pulps.

India was represented at the meeting by Shri S. G. Ramachandran, First Secretary (Commercial), Embassy of India, Paris.

3.2.9 *ISO/TC 17 — Steel* — The fifth plenary meeting of this Committee held in London from 4 to 7 March 1957 reviewed the position of work on the draft ISO recommendations prepared by it, and considered in detail draft proposals for 13 methods of tests. Draft ISO recommendations received during the period under review were on Brinell hardness test, Rockwell hardness test (B & C scales), Vickers hardness test, Charpy impact test (U Notch), Izod impact test, bend test, tensile testing of steel sheet and strip less than 3 mm and not less than 0·5 mm thick, simple bend testing of sheet and strip less than 3 mm thick, reverse bend testing of sheet and strip less than 3 mm thick, and tensile testing of wire.

The meeting was attended on behalf of India by Dr. A. K. Mallik, Chief Metallurgist, Indian Iron & Steel Co. Ltd., Burnpur; Shri Viswanathan, Superintendent of Research, the Tata Iron & Steel Co. Ltd., Jamshedpur; Shri L. T. Madnani, Railway Adviser to the High Commissioner for India in U.K.; and Shri T. V. Joseph, Officer on Special Duty, Indian Standards Institution.

3.2.10 *ISO/TC 22 — Automobiles* — Draft ISO Recommendation No. 38 Illuminating and Indicating Lights for Motor Cars, Trailors and Motor

Cycles was discussed at the seventh meeting of this Committee held at London from 11-16 June 1956 and attended by Dr. Verman as observer.

3.2.11 *ISO/TC 24 — Sieves* — The following items were discussed at the meeting in Dusseldorf from 26-29 June 1956:

i) Report on the progress of the German standardization work in the field of sieves in comparison with international standards,
ii) Possibilities regarding the unification of international testing sieves,
iii) Various methods and directions for carrying out analysis of testing sieves,
iv) Possibilities for unification of international methods of analysis of testing sieves, testing sieve machines included,
v) Terms, symbols and definitions in the field of sieves, and
vi) Future programme of work.

India was represented at the meeting by Shri C. S. Chandrasekhara, Deputy Director (Building) ISI, and Shri R. L. Acharya of the National Instruments Factory, Calcutta.

3.2.12 *ISO/TC 29 — Small Tools* — Draft ISO Proposals for the following were discussed and approved for circulation as draft ISO recommendations subject to a few modifications at the seventh plenary meeting of ISO/TC 29 held in Paris from 22-25 October, 1956:

i) Drills,
ii) Reamers,
iii) Driving squares,
iv) Screwing taps,
v) Milling cutters, boring and keying, tenon drive and outside diameters,
vi) Spacing collars for milling arbors,
vii) Reduction sleeves and extension sockets,
viii) Taper sleeves for drill chucks,
ix) Shanks for pneumatic tools,
x) Saws,
xi) Driving squares for socket wrenches,
xii) Turning and planing tools,
xiii) Files,
xiv) Grinding wheels, and
xv) Carbide tipped lathe tools.

The meeting was attended by Mr. D. A. James, Chief Engineer, Indian Stores Department, London.

3.2.13 *ISO/TC 30 — Measurement of Fluid Flow* — The Second Draft Recommendation on Fluid Flow Measurement Through Orifices, Plates and Notches was the main item of the agenda. The Indian Delegation had a large number of comments to make on the various clauses proposed for inclusion in the draft Recommendation. As a result of discussion, the consideration of the draft Recommendation was postponed to a further meeting and the work of re-drafting the Recommendation entrusted to a working group on which India is represented.

3.2.14 *ISO/TC 30/SC 1 — Liquid Flow Measurement in Open Channels — (Secretariat: India)* — The Subcommittee approved the scope as drafted by the Secretariat which is held by the ISI, and also accepted the following documents from India as basic documents for further work on these subjects:

1) Glossary of Terms Relating to Measurement of Liquid Flow in Open Channels
2) Measurement of Liquid Flow in Open Channels by Velocity Area Methods
3) Measurement of Liquid Flow in Open Channels Using Notches, Weirs and Flumes
4) Standard Forms for Recording Measurement of Liquid Flow in Open Channels

Three working groups were set up to deal with the three aspects, namely terminology, flow of water in open channels by velocity area methods and flow of water in open channels by the use of notches, weirs and flumes. The Indian delegation to this meeting and that of ISO/TC 30, which were held at Munich from 9-14 July 1956, comprised the following:

i) Shri Kanwar Sain, Chairman, Central Water & Power Commission,
ii) Shri K. N. Kathpalia, Director, Irrigation Research Institute, Roorkee,
iii) Dr. S. K. Roy, Central Water & Power Research Station, Poona,
iv) Dr. H. L. Uppal, Director, Irrigation Research Institute, Amritsar,
v) Shri R. K. V. Narasimham, Engineering Research Institute, Hyderabad, and
vi) Shri N. V. Modak, Special Engineer, Bombay Municipal Corporation.

The secretariat work of the meeting was dealt with by Shri C. S. Chandrasekhara, Deputy Director, (Building), ISI.

3.2.15 *ISO/TC 38 — Textiles* — Methods of tests for fibres, yarns and fabrics discussed by the Committee which held its third meeting from 15-18 May 1956 at Southport, England, covered methods of determination of strength of cloth, yarn and fibre, commercial weight, cloth length, width and area, definition of conditioning and testing atmosphere and consideration of systematic reduction of cloth width. One of the decisions of the Committee, which has an important bearing on the textile industry, was the recommendation for one uniform system of measurement of yarn count based on metric units, and the adoption of ' tex ' (grams per kilometre) as the basic unit for expressing the linear density of all fibre yarns and threads. Whilst the need for expressing yarn number on a uniform basis was recognized for many years, there was considerable divergence of views as to what the basic unit should be. The unanimous decision, therefore, was a real achievement which was in no small degree made possible by a concession on the part of USA.

The Textiles Committee set up a Working Group to consider the problem of waterproofness testing and considered some fundamental aspects relating to cloth-strength testing and issued further directives. The Committee also deliberated on calculation of commercial weight of fibres with the object of giving the vendor and purchaser the maximum guarantee of accurate weight assessment. Draft proposals dealing with the cloth length, width and weight per unit length or area were also considered.

Conditioning atmosphere — The revised document on standard atmosphere for conditioning and

for determining the physical and mechanical properties of textiles was presented at the meeting. Since the clause relating to ' Conditioning ' provided for prior agreement between the parties as obligatory every time the standard supplementary atmosphere was to be used for making tests on textile materials, the Indian delegate suggested re-wording of the clause relating to conditioning and testing in tropical and sub-tropical countries.

The meeting was attended on behalf of India by Shri Maharaj Kishen, Deputy Director (Textiles) ISI (Leader) and Shri M. L. Shroff.

3.2.16 *ISO/TC 38/SC 6 — Fibre Testing with Special Reference to Man-Made Fibres* — The Subcommittee held its meeting on 11 and 12 May 1956 and considered proposals on methods for determination of wool fibre diameter, fibre length at zero gauge length, titre, breaking load, micronaire values, and strength of cotton fibres. The Subcommittee also set up a Working Group for the study of test methods for cotton fibres and assigned its Secretariat to the United States. This Working Group was requested to accord priority to this work in order to meet urgent needs of the international trade.

3.2.17 *ISO/TC 38/SC 5 — Yarn Testing* — The Subcommittee held its meeting on 14 and 17 May 1956 at Southport, England, and approved the draft proposals for determination of linear density (mass per unit length) of yarn packages — (skein method), method of test for twist in yarn and methods of test for breaking load and breaking elongation of yarn (single strand).

3.2.18 *ISO/TC 45 — Rubber* — The ISO/TC 45 — Rubber was quite active even though no meeting of this Technical Committee was held during the year under review. Five draft ISO recommendations were submitted to the ISO Council for approval as ISO recommendations and Draft ISO Recommendation No. 50 — Determination of Hardness, was submitted to the General Secretariat for presentation to the ISO Council for approval as an ISO recommendation. Besides these, Draft ISO recommendations on sampling of latex, determination of resistance to crack growth, determination of resistance to flex cracking and accelerated ageing were submitted to the General Secretariat for circulation to the member bodies of ISO. Work on other subjects, such as latex, classification of vulcanized rubber by physical properties, cold resistance, terminology, mechanical conditioning, swelling, etc, was in progress. The next meeting of this Technical Committee was planned to be held in Zürich in September 1957.

3.2.19 *ISO/TC 46 — Documentation* — The sixth meeting of this Committee, held at Stuttgart from 30 August to 1 September 1956 resolved to accept the amended document on bibliographical references I as Third Draft ISO Recommendation No. 23. The Committee agreed to withdraw Draft ISO Recommendation No. 24 Bibliographical References II (Full References). It further decided to prepare a new draft proposal which would take into account the latest developments in the study of the problem, arising from the consideration of the second draft ISO Recommendation No. 23 Bibliographical References I.

Regarding Abstracts and Synopsis, it was decided to produce two separate draft proposals, both based on document 382 after re-drafting them suitably to bring out clearly in both new proposals the basic similarities and differences between abstracts and synopsis.

The Committee agreed that the subject ' Proof Correction Signs' is to be maintained on the programme of work.

Dr. S. R. Ranganathan, chairman, ISI Documentation Sectional Committee, represented India at this meeting.

3.2.20 *ISO/TC 47 — Chemistry* — The fourth meeting of this Technical Committee was held at Sirmione (Lake Garda, Italy) from 1 to 4 October 1956. The Committee had evolved a Draft ISO Recommendation for Guide on the Format for Standards for Chmical Products and for Methods of Chemical Analysis. The ISI approved the Draft Recommendation with reservation. In the original Draft ISO Recommendation a reference temperature of 20°C was provided for physical and physico-chemical characteristics. The major change that ISI proposed was concerning the addition of supplementary reference temperature of 27°±2°C for tropical and sub-tropical countries.

Shri Madanjeet Singh, the Cultural Attachè, Indian Embassy at Rome represented India at this meeting.

3.2.21 *ISO/TC 48 — Laboratory Glassware and Related Apparatus* — At the fourth meeting of ISO/TC 48 held in November 1954 at London three proposed draft ISO recommendations dealing with general principles to be observed in drawing up specifications for volumetric glassware, liquid-in-glass laboratory thermometers, and hydrometer, were approved. No objections were received from the member countries represented at the meeting, and the documents would normally have been sent to the ISO General Secretariat as Draft ISO Recommendations. This was not done in view of a request from the USA, which became a participating member during 1955 and submitted detailed comments on these drafts. These comments are under consideration of the appropriate working group and its recommendations would be placed at the fifth meeting of ISO/TC 48 scheduled to meet in May 1957.

The standardization of interchangeable conical ground glass joints had been considered at each of the meetings of ISO/TC 48. At the fourth meeting, previous decisions were confirmed, and points of disagreement were resolved on clauses of a draft proposal relating to taper, large, end diameter and length of ground zone. As a result of further discussion in the relevant working group, draft clauses on tolerances and surface finish will be put up to the fifth meeting.

Substantial progress was also made with regard to draft ISO proposals on burettes, long and short, solid stem and enclosed-scale thermometers for general use in precision work, density and specific gravity hydrometers, the method of test for measuring the resistance of laboratory glassware to thermal shock.

The fourth meeting approved a programme of collaborative tests on glass flask in relation to chemical attack. Discussions on this item were actively continued by the relevant working group and further tests arranged, not only on glass flask but also on glass pieces and grains.

India was not represented at the meeting.

3.2.22 *ISO/TC 50 — Lac (Secretariat: India)* — Although no meeting of this Technical Committee was held during the year, the Draft ISO Recommendations for Seedlac, Shellac and Bleached Lac were circulated to all Member Bodies of the ISO for comments. The UK, the USA and Japan offered some comments which were of editorial nature. On the basis of these comments, the Draft ISO Recommendations would be amended by the Secretariat and submitted to the ISO Council at its next meeting to be held in Geneva from 22 to 26 July 1957 for adoption as ISO Recommendations.

In pursuance of the decision of the ISO/TC 50, the Secretariat had worked out a scheme of round robin tests for the determination of bleach index and bleachability of seedlac and non-volatile matter soluble in cold alcohol in seedlac, shellac and bleached lac in consultation with the participating members of the Committee. Five laboratories each in the UK and the USA, two in France and four in India have agreed to carry out necessary tests. The samples would be provided by the Indian Lac Research Institute, Ranchi, who would also act as co-ordinating authority for these tests. Besides, the following methods of test were under study by the Committee:

i) Colour index (seedlac, shellac, bleached lac)
ii) Acid value of shellac
iii) Flow tests of shellac
iv) Conditioning shellac samples for heat polymerization and flow tests of shellac
v) Adhesive strength of shellac
vi) Determination of rosin in shellac

3.2.23 *ISO/TC 54 — Essential Oils* — The third meeting of ISO/TC 54 was held at Porto (Portugal) from 19 to 26 September 1956. India was not represented at this meeting. The Committee approved the Draft ISO Recommendations for (i) General Guide for the Packing of Essential Oils, and (ii) General Guide for the Labelling and Marking of Containers for Essential Oils for further processing. The Committee decided to continue the study of Draft ISO Recommendation on General Directions for Sampling of Essential Oils. Four draft proposals were approved for issuing as draft ISO recommendations.

3.2.24 *ISO/TC 55 — Resinous Lumber* — This Technical Committee met in Leningrad from 21-25 August 1956. The following documents were discussed:

i) Softwood converted timber, sizes
ii) Softwood converted timber, defects.

3.2.25 *ISO/TC 56 — Mica (Secretariat: India)* — In pursuance of the decisions taken at the third meeting of the Committee at Paris (October 1954), the secretariat prepared a Draft Recommendation for Grading of Muscovite Mica Blocks, Thins and Condenser Films. The draft received approval of the 'P' Members of the Committee and was circulated by the ISO General Secretary to all ISO members. In accordance with the Directives for the Technical Work of ISO, the last date for commenting on the Draft Recommendation was 20 March 1957, by which date 24 member bodies had replied out of a total membership of 37. Having been approved by the majority of the ISO members, the draft reached the stage of submission to ISO Council for adoption as an ISO Recommendation.

Other items of work on the programme of the Committee, including classification of muscovite mica, grading of muscovite splittings and grading of phlogopite mica, required another meeting of the committee to compose the differences revealed by the comments from members. The secretariat proposed a meeting in Brazil — a 'P' member country with very substantial interest in mica — where, no meeting had been held previously. The United Kingdom and France, however, intimated their inability to appoint delegations if the meeting were to be held in that distant country, and the proposal had to be dropped.

3.2.26 *ISO/TC 61 — Plastics* — The sixth meeting of ISO/TC 61, held from 17 to 22 September 1956 at The Hague, was attended by Shri S. K. Chowdhury, First Secretary, Embassy of India, Netherlands, on behalf of India. Besides the nine draft ISO recommendations which were already under consideration by the member bodies of the ISO, the Committee approved the following methods for issuing as draft ISO recommendations:

i) Determination of bulk factor of moulding materials
ii) Detection of free ammonia in phenol formaldehyde mouldings
iii) Determination of the percentage of styrene in polystyrene with wijs solution
iv) Determination of viscosity number of polyvinyl chloride resin in solution
v) Determination of resistance of plastics to chemical substances
vi) Determination of the loss of plasticizers from plastics
vii) Determination of migration of plasticizers from plastics
viii) Determination of flexural properties of rigid plastics

In pursuance of the decision taken by the ISO/TC 61 at its sixth meeting the Second Draft ISO Proposals for Standard Laboratory Atmospheres for Testing Plastics Materials and Standard Conditioning of Plastic Materials Prior to Testing as proposed by Working Group 3 were circulated by the secretariat (USA) of ISO/TC 61 to all member bodies for comments. India has approved both these proposals.

On an invitation from the secretariat (USA) of ISO/TC 61 — Plastics, Dr. Verman was nominated to act for 3 years as Leader of Working Group No. 3 on Standard Laboratory Atmospheres and Conditioning Procedures. He took over this responsibility at the close of The Hague meeting.

3.2.27 *ISO/TC 65 — Manganese Ores* — The second plenary meeting of this Technical Committee considered draft proposals for ISO recommendations for (i) methods of sampling manganese ores, Part I — ore loaded in wagons, and (ii) methods of chemical analysis of manganese ores.

On the basis of the decisions taken at the meeting, revised draft proposals for ISO

recommendations have been received on the following subjects:

1) Methods of Chemical Analysis of Manganese Ores:
   a) determination of hygroscopic moisture,
   b) determination of silicon dioxide,
   c) determination of manganese dioxide (pyrolusite),
   d) determination of total iron content,
   e) determination of carbon dioxide,
   f) determination of nickel,
   g) determination of cobalt,
   h) determination of arsenic,
   j) determination of aluminium oxide, and
   k) determination of total manganese.
2) Methods of Sampling Manganese Ores — Part I Ore Loaded in Freight Cars.

The meeting, which was held at Leningrad from 21 to 25 August 1956 was attended by Shri V. K. Ahuja, First Secretary, Embassy of India at Moscow as an observer from India.

3.2.28 *ISO/TC 67 — Material for Pipelines and Other Fixed Installations in the Field of Petroleum Industry* — India is an observer member of this Committee. The first meeting of the Committee was held in Geneva on 13 July 1956. At this meeting the Committee outlined its scope of work and also decided to change its designation to read as " Materials and Equipments for the Petroleum Industry ".

The Committee has undertaken work on specifications for (i) linepipes and (ii) flanges, flanged fittings and flanged valves for pipelines.

3.2.29 *ISO/TC 71 — Concrete and Reinforced Concrete* — An observer, Shri G. Sukumaran, from the Legation of India at Vienna attended this meeting in Vienna on 9-10 October 1956. The following documents were discussed:

a) Draft ISO Proposal for the Terminology on Concrete and Reinforced Concrete, and
b) First Draft Proposal for the Standardization of Measurements and the Making of Concrete Specimens.

3.2.30 *ISO/TC 78 — Aromatic Hydrocarbons* — In the second meeting of this Technical Committee held at London from 19 to 21 March 1957, it was decided that the specific gravity figures at 15°/15°C previously agreed for benzenes, benzoles, toluenes and toluoles should be replaced by density figures at 20°C and that, in future, requirements should be prescribed in the latter terms. A working group was set up comprising members from France, India, UK and USSR to prepare tables of conversion from specific gravity at various temperatures to density at 20°C. Arising out of the decision at the last meeting, the Committee, on the basis of data collected, considered methods of test, such as total sulphur, hydrogen sulphide mercaptans, corrosive sulphur, carbon disulphide, corrosion and crystallization point. However, since divergent views were expressed by different members, the Committee decided to collect more data and to study them further for consideration at the next meeting. Other items discussed were detection of visible water, determination of crystallization point and carbon disulphide, and specification of distillation apparatus.

There was considerable discussion on nomenclature. It was agreed to specify one grade of xylene only with the title ' XYLENE '. India suggested, and the Committee agreed, that the scope should indicate that the material comprises the three isomers of xylene and ethyl benzene. The specification requirements of a Draft ISO Proposal for Xylene were also agreed. The Indian delegation to this meeting consisted of Dr. S. Krishna (Leader) Scientific Liaison Officer and Scientific Adviser to the High Commission for India in the UK, London; Dr. J. S. Aggarwal, Senior Scientific Officer, National Chemical Laboratory of India, Poona; Mr. M. C. Hall, Industrial Products Manager, Burmah-Shell, Calcutta; and Shri T. V. Joseph, Officer on Special Duty, ISI.

3.2.31 *ISO/TC 79 — Light Metals and Their Alloys* — The second meeting of this Committee was held from 15 to 19 October 1956 in Paris. At this meeting, the Committee considered draft proposals prepared by the secretariat and the working groups on the following subjects:

a) Non-alloy magnesium ingots,
b) Composition of cast parts of magnesium/aluminium/zinc alloys,
c) Magnesium/aluminium/zinc alloy ingots for founding,
d) Composition of the mould pieces made of alloys of magnesium/zinc/zirconium/rare clays,
e) Non-alloy aluminium ingots,
f) Composition of aluminium alloy cast parts, and
g) Composition of welded aluminium and aluminium alloy products.

The secretariat proposals for mechanical tests methods, namely tensile test, Brinell hardness test, Vicker hardness test and reverse bend test were also considered.

Draft proposals for ISO recommendations have been received on the following subjects:

i) Tensile test for light metals and their alloys,
ii) Specification and classification of composition for aluminium alloy castings,
iii) Definition and classification of 99·8 unalloyed magnesium ingots,
iv) Specification and classification of compositions of cast parts in magnesium-aluminium-zinc alloys,
v) Specification and classification of magnesium-aluminium-zinc alloy ingots for casting purposes, and
vi) Classification and composition of remelt ingots and pigs of unalloyed aluminium.

A Subcommittee on Methods of Chemical Analysis (ISO/TC 79/SC 1) has also been set up and India has agreed to participate as ' P ' member of this Subcommittee.

India was not represented at this meeting.

3.2.32 ISO Recommendations listed below were received during the period under review:

ISO R8 Layout of Periodicals

ISO R9 International System for the Transliteration of Cyrillic Characters

ISO R10 Aircraft Connection for Ground Air-conditioning

ISO R11 Aircraft Pressure Cabin Ground Test Connection

ISO R16 Standard Tuning Frequency

ISO R17 Guide to the Use of Preferred Numbers and Series of Preferred Numbers

ISO R18 Short Contents List of Periodicals or Other Documents

Besides these publications, 67 draft ISO Recommendations were also received during the same period. As in the past, they were referred to the appropriate committees of the Institution. Where such committees did not exist, the draft recommendations were brought to the notice of Government Departments and such other organizations in the country as were concerned with the subject matter.

3.3 International Electrotechnical Commission (IEC) — The IEC maintained its usual brisk activity during the year. Besides a few individual meetings arranged at various places, the grouped meetings were held at Münich (West Germany) from 26 June to 6 July 1956, where the Committee of Action, 38 technical committees, subcommittees, committees of experts and working groups met for 147 halfday sessions. The General Meeting was attended by 750 delegates from 26 member countries. The Indian delegation consisted of 5 members who could cover between themselves only some meetings of the following committees:

Name of Delegate	*Committee*
Shri K. R. Anand, Himco (India) Private Ltd., Bombay	IEC/TC 35 — Primary Cells and Batteries
Dr. G.N. Bhattacharya, University College of Science & Technology, Calcutta	IEC/SC 2B — Dimensions of Motors IEC/TC 15 — Insulating Materials IEC/SC 40-5 — Basic Testing Procedure (Electronic Components) IEC/TC 42 — High Voltage Testing Techniques
Shri K. A. Dave, Bombay Electricity Board	IEC/TC 5 — Steam Turbines
Shri H. N. Doshi, Estrela Batteries Ltd., Bombay	IEC/TC 35 Primary Cells and Batteries
Dr. Lal C. Verman, Director, ISI	Committee of Action IEC/SC 2B — Dimensions of Motors IEC/SC 7-1 — Aluminium Alloy IEC/TC 15 — Insulating Materials IEC/TC 35 — Primary Cells and Batteries IEC/TC 39 — Electronic Tubes and Valves IEC/SC 40-5-B Basic Testing Procedure (Electronic Components)

A brief account of the meetings attended by the Indian Delegation is given below:

3.3.1 *Committee of Action* — The Committee of Action held two meetings, the first on 27 June and the second on 6 July 1956. The Committee dealt with a number of administrative matters including finance, and received reports from the various technical committees which had met before in Münich. Some of the important decisions of the Committee were as follows:

i) The Treasurer's proposal that, due to the increase in the work, the annual contributions of the National Committees should be raised by 50 percent from 1 January 1958, was accepted. This has meant an increase in the ISI's annual subscription to the IEC from S.F. 4 000 to 6 000.

ii) An invitation from the USSR National Committee to hold the 1957 General Meeting in Moscow from 2 to 12 July, was accepted. It was also decided to accept an invitation from the Swedish National Committee to have the 1958 General Meeting in Stockholm. Note was taken of a provisional invitation from the Spanish National Committee to meet in Spain in 1959.

Formal invitation on behalf of the Indian National Committee to hold General Meeting in India in 1959 or after, could not be extended at the meeting due to the late receipt of the approval of the Government of India. The invitation has subsequently been extended and is under consideration of the IEC Central Office.

iii) A statement regarding the subjects of interest to the IEC in the field of peaceful uses of nuclear energy was approved for transmission through ISO to the United Nations and the Organization for European Economic Recovery (OEEC).

iv) A special subcommittee on safety regulations, under the chairmanship of Mr. H. A. R. Binney, Director BSI, was established on a permanent basis with the German National Committee as Secretariat. This Subcommittee will serve the Committee of Action in an advisory capacity.

v) Additional directives were approved for facilitating the progressing of the work of the Commission, one defining the procedure to be followed when a technical committee or a subcommittee desires to hold a meeting, and the other recomending whenever practicable the formation of working groups within technical committees and subcommittees.

vi) An invitation for liaison from the International Organization on Legal Metrology was accepted and Professor Dr. R. Vieweg was appointed as the IEC representative on this body.

vii) A decision on a proposal from the Indian National Committee for the standardization of fans other than those of the industrial type was postponed until National Committees have had time to consider the matter and sent their views to the Central Office.

The Committee of Action finally received the reports of the technical committees which had held meetings in Münich and approved the issue of several publications as well as the circulation of a number of draft recommendations for approval under the six months' or two months' procedure.

3.3.2 *IEC/SC 2B — Dimensions of Motors* — Among the technical committee meetings of the IEC which were attended by the Indian delegation this year, this meeting could be considered as the most important from the point of view of results achieved by Indian participation.

This committee has had under active consideration for some years now, proposals for standardization of a series of frame sizes and mounting dimensions for electric motors. So far, no general agreement has been reached except that contained in the IEC Publication No. 72 which recommends two series of dimensions for frame sizes, one based on the inch series and the other on the millimetre series. India has all along been pressing for adoption of a single series at the international level and this time a concrete proposal based on the metric series was put forward by the ISI, which, in their opinion afforded a practical compromise between the two series in the IEC report. This proposal had been arrived at by the ISI Industrial Motors Subcommittee (EDC 6 : 3) after consultations with Indian manufacturers. The Indian proposal received good support at the meeting, after an amount of initial opposition from some of the delegations, and it was agreed to examine this further in detail. As a follow up to this decision, a questionnaire has been issued by the IEC Secretariat to all the national committees asking for views on specific points in the Indian proposal, and a programme has been drawn up for the further processing of this proposal by meetings of the Special Working Group set up for this purpose.

The Working Group met in Paris from 10 to 12 December 1956. India was represented by Shri S. R. Ray of the Indian High Commission in London.

3.3.3 *IEC/TC 5 — Steam Turbines* — New proposals for standard ratings for 50 c/s steam turbines, with steam pressures and temperatures were discussed and unanimous agreement was obtained. These proposals will be circulated to the national committees for approval under two months' procedure.

IEC Recommendations on Steam Turbines, Part II, Rules for Acceptance Tests and Appendix to IEC Publication No. 46, Supplementary Notes to Section 4, Instruments and Methods of Measurement, Part II, Rules for Acceptance Tests were also discussed. Comments were made by the various delegations and further comments will be submitted in writing. The secretariat will prepare a new draft taking these comments into consideration, for discussion at the next meeting of the committee.

3.3.4 *IEC/SC 7-1 — Aluminium Alloy* — This Subcommittee discussed a draft international specification for aluminium alloy electrical conductor wire of the Al-Si-Mg type. This draft had completed six months' circulation and was approved for publication after making a few changes. In India, we have so far been using ACSR (aluminium conductors steel reinforced) for transmission purposes, and the use of aluminium alloy for condcutor wire has not yet been started.

3.3.5 *IEC/TC 15 — Insulating Materials*

Experts Committee — This Committee of Experts, drawn from ten countries, discussed the question of co-ordination in the field of conditioning for testing of electrical insulating materials. A set of laboratory temperatures and referee test temperatures with appropriate tolerances were agreed upon after considering the recommendations of the IEC Subcommittee 40-5 — Basic Testing Procedures. The US National Committee was entrusted the task of initiating the collection of data and co-ordination on the question of conditioning in test chambers. Dr. Verman and Dr. Hogberg (of Sweden) were appointed as temporary representatives of the Experts Committee of TC 15 on ISO/ATCO until definite procedures were established by the Committee of Action of the IEC for such representation.

Among other items discussed by the Committee was the format and procedure applicable to the preparation of standard test methods for insulating materials, with a view to eliminating variations in different IEC recommendations involving testing of electrical insulating materials.

3.3.6 *IEC/TC 35 — Primary Cells and Batteries* — Draft IEC Recommendation for Primary Cells and Batteries was approved for publication as an IEC Recommendation. The standardization of combined batteries, batteries for transistors and mercury cells was discussed, including the code designation and tests of these latter cells. The question of internal impedance of hearing aid batteries was also discussed at the request of IEC/TC 29 — Electroacoustics, and it was decided to ask for further information from TC 29, after which a test programme will be carried out by the national committee. The question of standardization of connectors and terminals in collaboration with Subcommittee 40-4 — Connectors and Switches is under consideration.

3.3.7 *IEC/TC 39 — Electronic Tubes and Valves* — One item on the agenda was of special interest to India, concerning interconversion of inch-millimetre dimensions of valve bases and pins. Comments from different delegations on this document were considered. India had tabled copies of IS : 787-1956 to be considered in this connection. As there was not sufficient time before the meeting for the study of the Indian document, the Committee agreed that national committees should make a detailed study of the Indian proposal and report their reactions for further consideration. It was also decided that the relevant technical committee of the ISO should be requested to expedite the study of inch-millimetre conversion methods.

3.3.8 *IEC/SC 40-5 — Basic Testing Procedures* — This Subcommittee is primarily concerned with basic testing procedures (climatic, durability, etc,) of electronic components, and has also been given the responsibility to study and recommend standard testing conditions relating to temperature, relative humidity and pressure for the guidance of all other committees also. The most important item on the agenda for the meeting was the revision of IEC Publication on basic climatic and durability tests for electronic components. This Publication

(No. 68) has been current for the past 3 years and has largely formed the basis for the Indian Standard on the subject. However, there are a number of points on which the tropical conditions, as in India, required different methods of testing. Based on these considerations and on the experience gained in India, the Indian National Committee had made extensive and detailed comments on the draft revision. These related in the main to standard atmospheric conditions for testing and recovery, storage tests, component classification, mould growth and atmospheric contamination.

The Indian viewpoint was accepted on a number of points and mention may be made of the Committee's decision to include 27°±1°C as one of the standard temperatures for referee tests. Some of our observations regarding re-classification of components to include tropical types were discussed, but the Committee could not agree to any changes.

Reports from the Electronic Components Working Party and Bump and Vibration Test Working Party were also discussed.

3.3.9 *IEC/TC 42 — High Voltage Testing Techniques* — Draft Specification for High Voltage Testing Techniques was discussed and provisional agreement was reached on the general lines to be followed for the final draft. It was decided to separate the sphere gap chapter from the main body of the document, and, if possible, to publish it before the rest of the document.

Two working groups were formed, the first to deal with the question of sphere gaps, and the second to deal with measuring devices other than the sphere gap.

3.3.10 *IEC Publications* listed below were received by the ISI during the period under review:

50(07): 1956 International Electrotechnical Vocabulary: Electric

50(16): 1956 International Electrotechnical Vocabulary: Protective Rays

50(30): 1957 International Electrotechnical Vocabulary: Electric Traction

67: 1957 Dimensions on Electronic Tubes and Valves

72: 1956 Report on IEC Work on Standard Dimensions for Electric Motors

78: 1956 Characteristic Impedances and Dimensions of Radio Frequency Co-Axial Cables

80: 1956 Specification for Fixed Paper Capacitors for Electric Current

81: 1956 International Specification for Tubular Fluorescent Lamps for General Lighting Services

83: 1957 Standards for Plugs and Sockets-Outlets for Domestic and Similar General Use

Besides these Publications, 33 draft IEC Recommendations were also received. As in the past, they were referred to the relevant ISI sectional committees which considered them on behalf of the Indian National Committee.

4. APPENDICES

APPENDIX 4.1

(*Item* 2.10.1)

INDIAN STANDARDS PUBLISHED AND IN PRESS DURING 1956-57

[This list includes the Indian Standards which were under print on 31-3-1957 but not those which were under print on 31-3-56, and were printed during the year under report. The latter were included in a similar list published as Appendix 4.7 in last year's Annual Report]

Sl No.	IS:		Rs
EC			
1.	786-1956	Conversion Factors and Conversion Tables	5·00
2.	1020-1957	Conversion Tables for Ordinary Use	0·50
EDC			
3.	703-1956	Axes	1·50
4.	787-1956	Guide for Inter-Conversion of Values from One System of Units to Another	3·00
5.	842-1956	Smith's Swages	1·50
6.	843-1956	Smith's Tongs	1·50
7.	846-1956	Smith's Flatters	1·00
8.	847-1956	Smith's Fullers	1·50
9.	886-1957	Dimensions for Screw Threads (Below 6 mm)	1·50
10.	888-1956	Hollow Ground Razors, Open Type	1·00
11.	989-1956	Scissors	2·00
12.	992-1957	Forks (Table, Fish and Serving), Stainless Steel	1·50
13.	993-1957	Forks (Table, Fish and Serving), Brass and Nickel Silver ...	1·50
14.	994-1957	Fish Knives and Butter Knives	1·50
15.	995-1957	Table Knives, Dessert Knives and Fruit Knives	1·50
16.	1004-1956	Valve Grinding Paste ...	1·00
17.	1046-1957	Cash Boxes	1·50
18.	1062-1957	Methods of Test for Sparking Plugs	1·00
19.	1063-1957	14 mm Sparking Plugs ...	1·00
20.	1076-1957	Preferred Numbers	2·00
BDC			
21.	275-1957	Padlocks (*Revised*) ...	2·00
22.	456-1957	Code of Practice for Plain and Reinforced Concrete for General Building Construction (*Revised*)	5·00
23.	457-1957	Code of Practice for General Construction of Plain and Reinforced Concrete for Dams and Other Massive Structures ...	3·50
24.	458-1956	Concrete Pipes (With and Without Reinforcement) ...	2·50
25.	654-1957	Clay Roofing Tiles, Mangalore Pattern	1·50
26.	657-1956	Materials for Use in the Manufacture of Magnesium Oxychloride Flooring Compositions (*Tentative*)	2·50
27.	658-1956	Code of Practice for Magnesium Oxychloride Composition Floors (*Tentative*)	1·50
28.	712-1956	Building Limes	3·00
29.	772-1956	General Requirements of Enamelled Cast Iron Sanitary Appliances	1·00
30.	773-1956	Enamelled Cast Iron Water Closets, Railway Coaching Stock Type	1·00
31.	774-1957	Flushing Cisterns for Water Closets and Urinals ...	1·50
32.	775-1956	Brackets and Supports for Lavatory Basins and Sinks ...	1·50
33.	776-1957	Water Closet Seats and Covers	1·50
34.	779-1956	Water Meters With Threaded End Connections	1·50
35.	780-1956	Sluice Valves for Water Works Purposes	2·50
36.	782-1957	Caulking Lead	1·00
37.	785-1957	Reinforced Concrete Poles for Overhead Power and Telecommunication Lines	1·50
38.	875-1957	Code of Practice for Structural Safety of Buildings: Loading Standards	2·00
39.	876-1957	Wood Poles for Overhead Power and Telecommunication Lines	2·00
40.	883-1957	Code of Practice for Use of Structural Timber in Building (Material, Grading and Design) ...	2·00
41.	1018-1957	M Type Brass Padlocks ...	1·50
42.	1019-1957	Rim Latches	2·00
TDC			
43.	189-1956	Tamarind Kernel Powder for Use in the Cotton Textile Industry (*Revised*)	2·00
44.	750-1956	Handloom Cotton Lungies, Striped or Checked	1·50
45.	889-1957	Handloom Worsted Bunting Cloth, Heavy	1·00
46.	890-1957	Handloom Worsted Bunting Cloth, Light	1·00
47.	891-1957	Handloom Worsted Shirting ...	1·00
48.	892-1957	Handloom Woollen Blankets, Natural Grey	1·00
49.	893-1957	Handloom Woollen Blankets, Ordinary, Plain or Check ...	1·00
50.	894-1957	Handloom Woollen Blankets, Superior, Scarlet (Red) ...	1·00
51.	895-1957	Handloom Woollen Blanketing Cloth	1·00
52.	896-1957	Handloom Woollen Kamblies, Loomstate	1·00
53.	898-1957	Coir Fibre (*Tentative*) ...	1·50
54.	967-1956	Method for Determination of Colour Fastness of Textile Materials to Acid Chlorination ...	1·00

APPENDIX 4.1 — Indian Standards Published and in Press During 1956-57 — *Contd*

Sl No.	IS:		Rs
55.	968-1956	Method for Determination of Colour Fastness of Textile Materials to Acid Spotting ...	1·00
56.	969-1956	Method for Determination of Colour Fastness of Textile Materials to Cross-Dyeing: Wool ...	1·00
57.	970-1956	Method for Determination of Colour Fastness of Textile Materials to Degumming ...	1·00
58.	971-1956	Method for Determination of Colour Fastness of Textile Materials to Perspiration ...	1·00
59.	972-1956	Method for Determination of Colour Fastness of Textile Materials to Potting	1·00
60.	973-1956	Method for Determination of Colour Fastness of Textile Materials to Soda Boiling ...	1·00
61.	974-1956	Method for Determination of Colour Fastness of Textile Materials to Steaming	1·00
62.	975-1956	Method for Determination of Colour Fastness of Textile Materials to Sublimation ...	1·00
63.	976-1956	Method for Determination of Colour Fastness of Textile Materials to Water Spotting ...	1·00
64.	977-1956	Method for Determination of Colour Fastness of Textile Materials to Alkali Spotting ...	1·00
65.	978-1956	Method for Determination of Colour Fastness of Textile Materials to Carbonizing with Sulphuric Acid	1·00
66.	979-1957	Method for Determination of Colour Fastness of Textile Materials to Mercerizing ...	1·00
67.	980-1957	Method for Determination of Colour Fastness of Textile Materials to Stoving	1·00
68.	981-1957	Method for Determination of Colour Fastness of Textile Materials to Acid Milling ...	1·00
69.	1039-1956	Methods for Estimation of Small Quantities of Copper, Iron, Manganese, Chromium and Zinc in Proofed Cotton Fabrics (*Tentative*)	2·00
70.	1041-1957	Box Back Blanks for Jute Looms	1·00
71.	1042-1957	Boards for Lay Races of Jute Looms	1·00
72.	1043-1957	Blanks for Lay Blocks for Jute Looms	1·00
73.	1045-1957	Cotton Fabric for Covering Plywood in Aircraft	1·50
74.	1048-1957	Built Bobbins for Old-Type Dry Jute Spinning Frames ...	2·00
CDC			
75.	15-1956	Seedlac (*Revised*)	2·50
76.	16-1956	Shellac (*Revised*)	4·50
77.	17-1956	Bleached Lac (*Revised*) ...	3·00
78.	307-1956	Carbon Dioxide, Industrial ...	1·50
79.	309-1956	Compressed Oxygen Gas, Industrial	1·50
80.	437-1956	Size Grading of Coal and Coke for Marketing (*Revised*) ...	1·50
81.	575-1956	Chrome Belt Lace Leather ...	1·00
82.	618-1956	Kegs (Open Top Drums) for Paints	1·00
83.	622-1956	Russet Leather	1·00
84.	640-1956	Ready Mixed Red Oxide Paint for Hessian (Colour Unspecified)	1·00
85.	840-1956	Cashewnut Shell Liquid (CNSL)	2·00
86.	853-1956	Bone-Meal, Raw	1·50
87.	867(Part I)-1956	Methods of Sampling and Test for Phenolic Moulding Materials, Part I	2·50
88.	868-1956	Sealing Wax	1·00
89.	869-1956	Ethylene Dichloride, Technical	1·50
90.	870-1956	Ready Mixed Paint, Brushing, Finishing, Egg Shell Gloss, for Interior Use, to Indian Standard Colours No. 101, 216, 217, 219, 275 and 281	1·00
91.	871-1956	Ready Mixed Paint, Brushing, Finishing, Egg Shell Gloss, for Interior Use, to Indian Standard Colours, Class A No. 218 Class B No. 221 ...	1·00
92.	872-1956	Ready Mixed Paint, Brushing, Finishing, Egg Shell Gloss, for Interior Use, to Indian Standard Colours No. 412 and No. 413 ...	1·00
93.	877-1956	Methods of Sampling and Test for Activated Carbon Used for Decolourizing Vegetable Oils and Sugar Solutions	1·50
94.	878-1956	Graduated Measuring Cylinders	1·50
95.	879-1956	Sodium Nitrite, Technical ...	1·50
96.	880-1956	Tartaric Acid	1·50
97.	1001-1956	Fuel Pump Diaphragm Fabric (a) Synthetic Rubber Proofed, (b) Varnish Proofed ...	2·50
98.	1002-1956	Multipurpose Grease, No. 1, No. 2, and No. 3	2·00
99.	1013-1956	Triple Superphosphate ...	1·00
100.	1014-1956	Bone-Meal, Steamed ...	1·00
101.	1015-1956	Leather Pump Buckets Made from Vegetable Tanned Leather	1·50
102.	1016-1956	Methods of Sampling and Test for Oil Tanned Leathers ...	1·50
103.	1017-1957	Chamois Leather	1·50
104.	1021-1956	Caustic Soda, Pure ...	2·00
105.	1022-1956	Kotka Phosphate	1·50
106.	1023-1956	Dicalcium Phosphate ...	1·50
107.	1040-1957	Calcium Carbide, Technical ...	2·50
108.	1049-1957	Alcohol, Perfumery Grade ...	1·00
109.	1060(Part I)-1956	Methods of Sampling and Test for Paper and Allied Products, Part I	2·50
110.	1061-1957	Coal Tar Disinfectant Fluids, Black and White	2·00
111.	1064-1957	Paper Sizes	1·50
112.	1065-1957	Bleaching Powder, Stable ...	1·50
113.	1069-1957	Water for Storage Batteries ...	1·50
114.	1070-1957	Distilled Water	1·50
115.	1078-1957	Copper Naphthenate ...	1·50
AFDC			
116.	632-1956	BHC Emulsifiable Concentrates	3·00
117.	633-1956	DDT Emulsifiable Concentrates	2·50
118.	873-1956	Liquid Glucose	3·50
119.	874-1956	Dextrose Monohydrate ...	2·00
120.	881-1956	BHC, Refined	2·00
121.	882-1956	*gamma*-BHC (Lindane) ...	2·00
122.	885-1956	Common Names for Pesticides	2·00
123.	899-1956	Sago (*Saboodana*) ...	1·50
124.	1005-1957	Edible Maize Starch (Corn Flour)	1·50
125.	1007-1957	Custard Powder	1·50
126.	1009-1957	*Maida*	2·00
127.	1050-1957	Lime Sulphur Solution ...	2·00
128.	1051-1957	Pyrethrum Extracts ...	2·50
129.	1052-1957	Dieldrin, Technical ...	2·00
130.	1053-1957	Dieldrin Water Dispersible Powder Concentrates	2·00
131.	1054-1957	Dieldrin Emulsifiable Concentrates	2·50

APPENDIX 4.1 — Indian Standards Published and in Press During 1956-57 — *Contd*

Sl No.	IS:		Rs
132.	1055-1957	Nicotine Sulphate Solution ...	1·50
SMDC			
133.	24-1956	Brazing Solder (*Revised*) ...	1·00
134.	26-1956	Tin Ingot (*Revised*) ...	1·00
135.	27-1956	Pig Lead (*Revised*) ...	1·00
136.	192-1956	Silver Solder (*Revised*) ...	1·00
137.	193-1956	Soft Solder (*Revised*) ...	1·00
138.	209-1956	Zinc (*Revised*)	1·00
139.	225-1957	Pig Iron (Charcoal) (*Revised*)	1·50
140.	728-1956	Methods for Determination of Weight, Thickness and Uniformity of Coating on Galvanized Articles Other Than Wires and Sheets	1·50
141.	734-1956	Wrought Aluminium and Aluminium Alloys, Forgings (for Civil Engineering Purposes) ...	3·00
142.	735-1956	Wrought Aluminium and Aluminium Alloys, Forging Stock ...	2·00
143.	736-1956	Wrought Aluminium and Aluminium Alloys, Plate	3·00
144.	738-1956	Wrought Aluminium and Aluminium Alloys, Tube	3·00
145.	800-1956	Code of Practice for Use of Structural Steel in General Building Construction	7·50
146.	813-1956	Scheme of Symbols for Welding	3·00
147.	814-1957	Covered Electrodes for Metal Arc Welding of Mild Steel ...	3·00
148.	815-1956	Classification and Coding of Covered Electrodes for Metal Arc Welding of Mild Steel and Low Alloy High-Tensile Steels ...	2·00
149.	816-1956	Code of Practice for Use of Metal Arc Welding for General Construction in Mild Steel ...	2·00
150.	964-1956	Methods for Chemical Analysis of Silver Solder	1·00
151.	1028-1956	Silicon Bronze Ingots and Castings	1·00
152.	1029-1956	Hot Rolled Steel Strips (Baling)	1·00
153.	1030-1956	Steel Castings for General Engineering Purposes	1·50
154.	1047-1956	Methods of Chemical Analysis of Antimony	1·50
ETDC			
155.	900-1956	Code of Practice for Installation and Maintenance of Induction Motors	2·00
156.	1031-1957	Methods of Measurements on Loudspeakers and Loudspeaker Systems	2·00
157.	1032-1957	General Requirements and Tests for Pressure Unit Operated Horn Loudspeaker Systems ...	1·50
158.	1033-1957	General Requirements and Tests for Direct Radiator Moving Coil Loudspeakers	1·50
159.	1034-1957	Loudspeaker Systems for Community Radio Receivers ...	1·00
160.	1036-1957	6-Volt Accumulator-Operated Community Radio Receivers ...	1·50

APPENDIX 4.2

(*Item* 2.11.1)

INDIAN STANDARDS FOR WHICH APPLICATIONS WERE RECEIVED FOR LICENCES UNDER THE ISI CERTIFICATION MARKS ACT

Sl No.	No. and Title of the Indian Standard	Number of Applications Received
	Engineering	
1.	IS: 624-1955 Specification for Bicycle Rims (*Tentative*) ...	1
	Building	
2.	IS: 215-1951 Specification for Road Tar	2
3.	IS: 216-1951 Specification for Coal Tar Pitch	1
4.	IS: 218-1952 Specification for Creosote and Anthracene Oil for Use as Wood Preservatives ...	2
5.	IS: 269-1951 Specification for Ordinary Rapid-Hardening and Low Heat Portland Cement ...	3
6.	IS: 451-1953 Specification for Wood Screws	1
7.	IS: 455-1953 Specification for Portland Blast Furnace Slag Cement (*Tentative*)	(grouped with IS: 269-1951)
8.	IS: 651-1955 Specification for Salt Glazed Stoneware Pipes and Fittings	4
	Chemicals	
9.	IS: 220-1950 Specification for Fountain Pen Inks, Blue-Black and Red	1
10.	IS: 253-1950 Specification for Edible Common Salt	1
11.	IS: 284-1951 Specification for Toilet Soap	1
12.	IS: 323-1952 Specification for Rectified Spirit	3 (2 grouped with IS: 324-1952)
13.	IS: 324-1952 Specification for Denatured Spirit	(2 grouped with IS: 323-1952)
14.	IS: 411-1953 Specification for Titanium Dioxide for Paints ...	1
15.	IS: 442-1954 Specification for Drums for Paints	1
16.	IS: 533-1954 Specification for Gum Spirit of Turpentine (Oil of Turpentine)	2
17.	IS: 553-1955 Specification for Rosin (Gum Rosin)	(grouped with IS: 533-1954)

APPENDIX 4.2 — Indian Standards for Which Applications were Received for Licences — *Contd*

Sl No.	No. and Title of the Indian Standard	Number of Applications Received
	Agricultural and Food Products	
18.	IS: 560-1955 Specification for BHC, Technical	(grouped with IS: 561-1955 & IS: 562-1955)
19.	IS: 561-1955 Specification for BHC Dusting Powder	(one grouped with IS: 560-1955 & IS: 562-1955 and the other only with IS: 562-1955)
20.	IS: 562-1955 Specification for BHC Water Dispersible Powder Concentrates	3
21.	IS: 563-1955 Specification for DDT, Technical	(grouped with IS: 564-1955 & IS: 565-1955)
22.	IS: 564-1955 Specification for DDT Dusting Powder	(one grouped with IS: 563-1955 & IS: 565-1955 and the other only with IS: 565-1955)
23.	IS: 565-1955 Specification for DDT Water Dispersible Powder Concentrates	2
	Structural and Metals	
24.	IS: 6-1953 Specification for Moderate Heat Duty Fire Clay Refractories, Group 'A' ...	1
25.	IS: 7-1953 Specification for Moderate Heat Duty Fire Clay Refractories, Group 'B' ...	
26.	IS: 8-1953 Specification for High Heat Duty Fire Clay Refractories	
27.	IS: 21-1953 Specification for Wrought Aluminium for Utensils	21
28.	IS: 192-1950 Specification for Silver Solder	1
29.	IS: 288-1951 Specification for Copper Rods for Boiler Stays ...	1
30.	IS: 291-1951 Specification for Naval Brass Rods, Bars and Sections ...	1
31.	IS: 319-1951 Specification for Free Cutting Brass Rods and Bars ...	(grouped with IS: 291-1951)
32.	IS: 320-1951 Specification for High Tensile Brass Rods, Bars and Sections	(grouped with IS: 291-1951)
33.	IS: 405-1952 Specification for Lead Sheets for General Purposes ...	1
34.	IS: 407-1953 Specification for Brass Tubes for General Purposes ...	1
35.	IS: 613-1954 Specification for Copper Bars and Rods for Electrical Purposes	(grouped with IS: 288-1951)
	Electrotechnical	
36.	IS: 203-1950 Specification for Leclanché Type Dry Cells and Batteries for Flash Lamps ...	1
37.	IS: 282-1951 Specification for Hard-Drawn Copper Solid and Stranded Circular Conductors for Overhead Power Transmission Purposes ...	1
38.	IS: 325-1956 Specification for Three Phase Induction Motors ...	1
39.	IS: 395-1952 Specification for Lead-Acid Storage Batteries for Motor Vehicles, Light Duty (*Tentative*)	1
40.	IS: 396-1953 Specification for Bare Annealed High-Conductivity Copper Wire for Electrical Machinery and Apparatus	1
41.	IS: 398-1953 Specification for Hard-Drawn Stranded Aluminium and Steel-Cored Aluminium Conductors for Overhead Power Transmission Purposes ...	2
42.	IS: 434-1953 Specification for Rubber-Insulated Cables and Flexible Cords for Electric Power and Lighting (for Working Voltages Up to and Including 11 kV) ...	2
43.	IS: 449-1953 Specification for Enamelled High-Conductivity Annealed Round Copper Wire (Oleo-Resinous Enamel)	1
44.	IS: 450-1953 Specification for Cotton-Covered High-Conductivity Annealed Copper Wire ...	1
45.	IS: 541-1954 Specification for Stationary Accumulators Lead-Acid Type	(grouped with IS: 395-1952)
46.	IS: 556-1954 Specification for Leclanché Type Dry Batteries for Radio Receivers ...	(grouped with IS: 203-1950)
47.	IS: 586-1955 Specification for Leclanché Type Dry Cells for Telecommunication Signalling and General Purposes	(grouped with IS: 203-1950)
48.	IS: 694-1955 PVC Cables and Cords for Electric Power and Lighting for Working Voltages Up to and Including 650 Volts to Earth ...	1
49.	IS: 722(Pt.I & II)-1955 Specification for AC Whole Current Electricity Meters	1

APPENDIX 4.3

(*Item* 2.11.12)

INDIAN STANDARDS ADOPTED BY VARIOUS GOVERNMENT DEPARTMENTS DURING THE YEAR ENDING 31 MARCH 1957

The following abbreviations have been used to denote adopting authority/ies in this Appendix.

CSO	Central Standards Office for Railways	**DGSD**	Directorate General of Supplies & Disposals
DGOF	Directorate General, Ordnance Factories	**DTD**	Directorate of Technical Development (Controller General of Defence Production), Ministry of Defence

Sl No.	No. and Title of Indian Standard	Adopting Authority/ies
(1)	(2)	(3)
	ENGINEERING	
	Tools	
1.	IS: 599-1954 Twist Drills (*Tentative*)	CSO
2.	IS: 620-1954 General Requirements for Tool Handles	DTD
3.	IS: 663-1955 Adzes	DTD, CSO, DGSD
	Machinery	
4.	IS: 549-1954 Split Cotter Pins	DTD
5.	IS: 554-1955 Pipe Threads for Gas List Tubes and Screwed Fittings	DTD
	Sports Goods	
6.	IS: 415-1953 Shuttlecocks (*Tentative*)	CSO
7.	IS: 416-1953 Cricket and Hockey Balls (*Tentative*)	CSO
8.	IS: 417-1953 Footballs, Volley-Balls, Basket-Balls, and Water Polo Balls	CSO
9.	IS: 827-1956 Sinew Guts (*Tentative*)	DGSD
10.	IS: 828-1956 Cricket Bats (*Tentative*)	DGSD
11.	IS: 829-1956 Hockey Sticks (*Tentative*)	DGSD
	Bicycle Components	
12.	IS: 532-1954 Bicycle Tube Valves	DTD, CSO
13.	IS: 627-1955 Bicycle Chains (*Tentative*)	CSO, DTD
14.	IS: 628-1955 Bicycle Pedal Assembly	DGSD, CSO, DTD
15.	IS: 629-1955 Bicycle Hub Assemblies	DGSD, CSO, DTD
	BUILDING	
	Cement, Concrete and Allied Materials	
16.	IS: 455-1953 Portland Blastfurnace Slag Cement	CSO
17.	IS: 459-1955 Unreinforced Corrugated Asbestos Cement Sheets	CSO, DTD
	Builder's Hardware	
18.	IS: 205-1950 Butt Hinges (*Tentative*)	CSO
19.	IS: 207-1950 Gate and Shutter Hooks and Eyes (*Tentative*)	CSO
20.	IS: 208-1950 Door Handles (*Tentative*)	CSO
21.	IS: 364-1952 Fanlight Catch (*Tentative*)	CSO
22.	IS: 723-1956 Mild Steel Wire Nails	CSO, DGSD, DTD
23.	IS: 724-1956 Mild Steel and Brass Cup, Ruler and Square Hooks and Screw Eyes	DGSD, CSO
	Timber and Timber Products	
24.	IS: 287-1951 Recommendations for Maximum Permissible Moisture Content of Timber Used for Different Purposes in Different Climatic Zones (*Tentative*)	CSO
25.	IS: 399-1952 Classification of Commercial Timbers and Their Zonal Distribution (*Tentative*)	CSO
26.	IS: 401-1954 Code of Practice for the Preservation of Timber (*Tentative*)	DTD
	Floor and Roof Coverings	
27.	IS: 653-1955 Sheet Linoleum	CSO
	Air-Conditioning and Refrigeration	
28.	IS: 655-1955 Metal Air Ducts	DGSD, CSO
29.	IS: 659-1955 Safety Code For Air-Conditioning	DGSD, CSO
30.	IS: 660-1955 Safety Code For Mechanical Refrigeration	DGSD, CSO
31.	IS: 661-1955 Code of Practice for Insulation and Safe Operation of Cold Storages	DGSD, CSO
	Sanitary Appliances and Fittings	
32.	IS: 651-1955 Salt Glazed Stoneware Pipes and Fittings	DGOF, DGSD, CSO

APPENDIX 4.3 — Indian Standards Adopted by Various Government Departments — *Contd*

Sl No.	No. and Title of Indian Standard		Adopting Authority/ies
(1)	(2)		(3)
Sanitary Appliances and Fittings — *Contd*			
33.	IS: 772-1956	General Requirements of Enamelled Cast Iron Sanitary Appliances	DGSD
34.	IS: 773-1956	Enamelled Cast Iron Water Closets, Railway Coaching Stock Type	DGSD
35.	IS: 779-1956	Water Meters With Threaded End Connections	DTD
Bitumen, Tar and Tar Products			
36.	IS: 334-1953	Glossary of Terms Relating to Bitumen and Tar	CSO
37.	IS: 454-1953	Digboi Type Cutback Bitumen	CSO
38.	IS: 702-1955	Blown Type Bitumen	DGSD, DTD
		TEXTILE	
Textile Test Methods			
39.	IS: 389-1952	Method for Estimation of Small Quantities of Sulphuric Acid and Hydrochloric Acid in Cotton Materials	DGSD
40.	IS: 390-1952	Method for Spray Test for Estimating the Water Repellency of Water-Resistant Fabrics (Permeable to Air)	DGSD
41.	IS: 391-1952	Method for Measuring Resistance to Penetration by Water of Water-Resistant Fabrics (Permeable to Air)	DGSD
42.	IS: 392-1952	Method for Measuring the Water Absorption and Penetration in Water-Resistant Fabrics (Permeable to Air) by a Bundesmann Type Apparatus (*Tentative*)	DGSD
43.	IS: 568-1954	Method for Determination of Twist in Single Jute Yarn	DGSD
44.	IS: 569-1954	Method for Determination of Breaking Load (Strength) of Jute Yarn	DGSD
45.	IS: 570-1954	Method for Determination of Grist (or Yarn Melidity in Tex) of Single Jute Yarn	DGSD
46.	IS: 687-1956	Method for Determination of Colour Fastness of Textile Materials to Hand Washing	DGSD
47.	IS: 688-1956	Method for Determination of Colour Fastness of Textile Materials to Organic Solvents	DGSD, DTD
48.	IS: 689-1956	Method for Determination of Colour Fastness of Textile Materials to Hot Pressing	DGSD, DTD
49.	IS: 690-1956	Method for Determination of Colour Fastness of Textile Materials to Sea Water	DGSD, DTD
50.	IS: 743-1955	Method for Determination of Moisture Content in Greasy Wool	DTD
51.	IS: 744-1956	Method for Determination of Mean Fibre Diameter of Raw Wool	DTD
52.	IS: 762-1956	Method for Determination of Colour Fastness of Textile Materials to Hypochlorite Bleaching	DGSD, DTD
53.	IS: 763-1956	Method for Determination of Colour Fastness of Textile Materials to Peroxide Bleaching	DGSD, DTD
54.	IS: 764-1956	Method for Determination of Colour Fastness of Textile Materials to Mechanical Washing (Mild)	DGSD
55.	IS: 765-1956	Method for Determination of Colour Fastness of Textile Materials to Mechanical Washing (Severe)	DGSD
56.	IS: 766-1956	Method for Determination of Colour Fastness of Textile Materials to Rubbing	DGSD, DTD
57.	IS: 767-1956	Method of Determination of Colour Fastness of Textile Materials to Water	DGSD, DTD
58.	IS: 768-1956	Method for Evaluating Change in Colour	DGSD, DTD
59.	IS: 769-1956	Method for Evaluating Staining	DGSD, DTD
Woollen and Worsted Fabrics			
60.	IS: 669-1955	Serge, Drab Mixture	CSO
Jute			
61.	IS: 271-1950	Grading of Raw Jute (Kutcha Assortment)	DGSD
62.	IS: 272-1950	Grading of Raw Jute (Pucca Assortment)	DGSD
Silk			
63.	IS: 461-1953	Method of Grading Raw Silk (*Tentative*)	DGSD
64.	IS: 462-1953	Method for Visual and Tactual Examination of Category I Raw Silk (*Tentative*)	DGSD
65.	IS: 463-1953	Method for Determining Conditioned Weight of Category I Raw Silk (*Tentative*)	DGSD
66.	IS: 464-1953	Method for Conducting Winding Test for Category I Raw Silk (*Tentative*)	DGSD
67.	IS: 465-1953	Method for Conducting Size (Denier) Deviation and Maximum Deviation Tests for Category I Raw Silk (*Tentative*)	DGSD
68.	IS: 466-1953	Method for Conducting Average Conditioned Size (Denier) Test for Category I Raw Silk (*Tentative*)	DGSD
69.	IS: 467-1953	Method for Conducting Evenness and Low Evenness Tests for Category I Raw Silk (*Tentative*)	DGSD
70.	IS: 468-1953	Method for Conducting Cleanness Test for Category I Raw Silk (*Tentative*)	DGSD

APPENDIX 4.3 — Indian Standards Adopted by Various Government Departments — *Contd*

Sl No.	No. and Title of Indian Standard		Adopting Authority/ies
(1)		(2)	(3)
Silk — *Contd*			
71.	IS: 469-1953	Method for Conducting Neatness Test for Category I Raw Silk (*Tentative*)	DGSD
72.	IS: 470-1953	Method for Conducting Serigraph Test for Determining the Tenacity and Elongation of Category I Raw Silk (*Tentative*)	DGSD
73.	IS: 471-1953	Method for Conducting Cohesion Test for Category I Raw Silk (*Tentative*)	DGSD
74.	IS: 472-1953	Method for Visual and Tactual Examination of Category II Raw Silk (*Tentative*)	DGSD
75.	IS: 473-1953	Method for Determining Conditioned Weight of Category II Raw Silk (*Tentative*)	DGSD
76.	IS: 474-1953	Method for Conducting Winding Test for Category II Raw Silk (*Tentative*)	DGSD
77.	IS: 475-1953	Method for Conducting Size (Denier) Deviation and Maximum Deviation Tests for Category II Raw Silk (*Tentative*)	DGSD
78.	IS: 476-1953	Method for Conducting Average Conditioned Size (Denier) Test for Category II Raw Silk (*Tentative*)	DGSD
79.	IS: 477-1953	Method for Conducting Evenness and Low Evenness Tests for Category II Raw Silk (*Tentative*)	DGSD
80.	IS: 478-1953	Method for Conducting Cleanness Test for Category II Raw Silk (*Tentative*)	DGSD
81.	IS: 479-1953	Method for Conducting Neatness Test for Category II Raw Silk (*Tentative*)	DGSD
82.	IS: 480-1953	Method for Conducting Serigraph Test for Determining the Tenacity and Elongation of Category II Raw Silk (*Tentative*)	DGSD
83.	IS: 481-1953	Method for Conducting Cohesion Test for Category II Raw Silk (*Tentative*)	DGSD
Cotton			
84.	IS: 174-1951	Flannelettes (Plain) (*Tentative*)	CSO
85.	IS: 176-1951	Bedtickings (*Tentative*)	DGSD
86.	IS: 180-1951	Cotton Sheetings (*Tentative*)	CSO
87.	IS: 184-1951	Cotton Dhoties (*Tentative*)	CSO
88.	IS: 188-1951	Cotton Poplins (*Tentative*)	DGSD
89.	IS: 293-1951	Code for Seaworthy Packaging of Cotton Textiles	DGSD
90.	IS: 514-1954	Mercerized Cotton Fabric, Grade 1, for Aircraft	DGSD
91.	IS: 598-1955	Mercerized Cotton Fabric, Grade 2, for Aircraft	DGSD
92.	IS: 714-1955	Cotton Reinforcing Tape for Aircraft	DGSD
93.	IS: 745-1955	Handloom Cotton Bed Sheets, Grey, Bleached, Dyed or Striped	DGSD
94.	IS: 746-1955	Handloom Cotton Blankets, Grey or Coloured	DGSD
95.	IS: 747-1955	Handloom Cotton Bunting Cloth, Dyed	DGSD
96.	IS: 748-1955	Handloom Cotton Dhoties, Grey	DGSD
97.	IS: 749-1955	Handloom Cotton Dungri Cloth, Grey	DGSD
98.	IS: 751-1955	Handloom Cotton Mazri Cloth (Loom State)	DGSD
99.	IS: 752-1955	Handloom Cotton Muslin, Bleached	DGSD, DTD
100.	IS: 753-1955	Handloom Cotton Pugri Cloth, Bleached or Dyed	DGSD
101.	IS: 754-1955	Handloom Cotton Saries, Bleached, Dyed, Striped, Checked or Printed	DGSD
102.	IS: 755-1955	Handloom Cotton Malmal, Bleached	DGSD, DTD
103.	IS: 756-1955	Handloom Cotton Dosuti, Grey, Scoured, Bleached or Dyed	DGSD, DTD
104.	IS: 757-1955	Handloom Cotton Lint, Absorbent, Bleached	DGSD, DTD
105.	IS: 758-1955	Handloom Cotton Gauge, Absorbent, Bleached	DGSD, DTD
106.	IS: 854-1956	Handloom Cotton Turkish Towels, Bleached, Striped, Checked, or Dyed	DGSD, DTD
107.	IS: 855-1956	Handloom Cotton Honeycomb Towels, Bleached, Striped, Checked, or Dyed	DGSD
108.	IS: 856-1956	Handloom Cotton Huckaback Towels, Bleached, Striped, Checked, or Dyed	DGSD, DTD
109.	IS: 857-1956	Handloom Cotton Napkins, Bleached, Striped, Checked, or Dyed	DGSD, DTD
110.	IS: 858-1956	Handloom Cotton Table Cloth, Bleached, Striped, Checked, or Dyed	DGSD, DTD
111.	IS: 860-1956	Handloom Cotton Sponge Cloth, Grey, Striped and Checked	DGSD, DTD
112.	IS: 861-1956	Handloom Cotton Jaconet Cloth, Grey, Dressed	DGSD
113.	IS: 862-1956	Handloom Cotton Ticking Cloth, Grey, Striped	DGSD, DTD
114.	IS: 863-1956	Handloom Cotton Bandage Cloth, Bleached	DGSD, DTD
115.	IS: 864-1956	Handloom Cotton Light Sheeting, Grey	DGSD
Miscellaneous Textile Items			
116.	IS: 189-1956	Tamarind Kernel Powder for Use in the Cotton Textile Industry (*Revised*)	DGSD
117.	IS: 300-1955	The National Flag of India (Silk Khadi)	CSO, DGSD
118.	IS: 400-1955	The National Flag of India (Wool Khadi)	CSO, DGSD, DTD
119.	IS: 759-1956	Blanks for Swells of Jute Looms	DGSD
120.	IS: 760-1956	Blanks for Jute Spinning Roller Discs	DGSD
		CHEMICAL	
Chemicals, Heavy			
121.	IS: 213-1956	Coal Tar Solvent Naphtha, Light Grade 1	DTD, CSO, DGSD
122.	IS: 249-1951	Sodium Bichromate, Technical	CSO

APPENDIX 4.3 — Indian Standards Adopted by Various Government Departments — *Contd*

Sl No.	No. and Title of Indian Standard		Adopting Authority/ies
(1)	(2)		(3)
Soaps			
275.	IS: 286-1951	Methods of Sampling and Test for Soaps	DGSD
276.	IS: 839-1956	Transparent Toilet Soap	DGSD
Oils and Greases			
277.	IS: 310 (Part II)-1954	Methods of Sampling and Test for Lubricants	DGSD, CSO
278.	IS: 408-1952	Grease, A No. 0, Graphited	CSO
279.	IS: 494-1954	Aluminium Stearate	DTD
280.	IS: 495-1954	Graphite, Flake, for Lubricants	DTD
281.	IS: 588-1954	Mosquito Larvicidal Oil	CSO
282.	IS: 719-19[illegible]	Grease, S/L No. 1	CSO, DTD, DGSD
283.	IS: 720	Grease, S. Hard, Loco	DGSD
284.	IS: [illegible]	Grease, S. Soft, Loco	DGSD, CSO
Esse[illegible]ls			
285.	IS: 512-1954	Citronella Oil	CSO
286.	IS: 533-1954	Gum Spirit of Turpentine (Oil of Turpentine) (*Tentative*)	CSO
287.	IS: 553-1955	Rosin (Gum Rosin)	CSO, DGSD
288.	IS: 761-1955	Ginger Oil	DGSD, CSO
Vegetable Oils			
289.	IS: 548-1954	Methods of Sampling and Test for Vegetable Oils and Fats	DGSD
Rubber Products			
290.	IS: 443-1953	Methods of Test for Hoses	DGSD
291.	IS: 635-1955	Oil Resisting Hose	CSO
292.	IS: 637-1955	Plain Rubber Tubing	CSO
293.	IS: 638-1955	Rubber and Insertion Jointing	DTD, CSO, DGSD
Leather and Leather Products			
294.	IS: 575-1956	Chrome Belt Lace Leather	DTD
295.	IS: 582-1954	Methods of Sampling and Test for Vegetable and Chrome Tanned Leathers	DGSD, DTD
296.	IS: 584-1954	Chaplis, Frontier Pattern, for General Purposes	DGSD, CSO
Coal and Coke			
297.	IS: 436-1953	Methods for Sampling of Coal and Coke (*Tentative*)	CSO
298.	IS: 437-1953	Size Grading of Coal and Coke for Marketing	CSO
299.	IS: 439-1953	Hard Coke (*Tentative*)	CSO
Office Stationery and Equipment			
300.	IS: 220-1950	Fountain Pen Inks, Blue-Black and Red	CSO
301.	IS: 221-1950	Fluid Ink for Registration and for Cheques and Records	CSO
302.	IS: 393-1952	Ink, Stamp-Pad	DGSD, CSO
303.	IS: 394-1952	Ink, Cloth Marking, Black	CSO
304.	IS: 788-1955	Ink, Drawing, Waterproof, Coloured, Transparent and Opaque	CSO, DGSD
305.	IS: 789-1955	Ink, Drawing, Waterproof, Black	CSO, DGSD
Plastics			
306.	IS: 840-1956	Cashewnut Shell Liquid (CNSL)	DTD
AGRICULTURAL AND FOOD PRODUCTS			
Pest Control Products			
307.	IS: 560-1955	BHC, Technical	DTD, CSO
308.	IS: 561-1955	BHC Dusting Powders	DTD, CSO
309.	IS: 562-1955	BHC Water Dispersible Powder Concentrates	DTD, CSO
310.	IS: 563-1955	DDT, Technical	DTD, CSO
311.	IS: 564-1955	DDT Dusting Powders	DTD
312.	IS: 565-1955	DDT Water Dispersible Powder Concentrates	CSO, DTD
Food Grain Storage			
313.	IS: 600-1955	Code of Practice for Construction of *Bukhari* Type Rural Food Grain Storage Structure	DGSD
314.	IS: 601-1955	Code of Practice for Construction of *Kothar* Type Rural Food Grain Storage Structure	DGSD
315.	IS: 602-1955	Code of Practice for Construction of *Morai* Type Rural Food Grain Storage Structure	DGSD
316.	IS: 606-1955	Code of Practice for Construction of Food Grain Storage Structures Suitable for Trade and Government Purposes for the *Eastern* Region	DGSD, DTD
317.	IS: 607-1955	Code of Practice for Construction of Food Grain Storage Structures Suitable for Trade and Government Purposes for the *Southern* Region	DGSD, DTD
318.	IS: 608-1955	Code of Practice for Construction of Food Grain Storage Structures Suitable for Trade and Government Purposes for the *Coastal* Region	DGSD, DTD

APPENDIX 4.3 — Indian Standards Adopted by Various Government Departments — *Contd*

Sl No.	No. and Title of Indian Standard		Adopting Authority/ies
(1)	(2)		(3)
Food Grain Storage — *Contd*			
319.	IS: 609-1955	Code of Practice for Improvement of Existing Structures Used or Intended to be Used for Food Grain Storage	DGSD
320.	IS: 610-1955	Code of Practice for Storage of Food Grain and Its Protection During Storage	DGSD
321.	IS: 611-1955	Code of Practice for Handling of Food Grain in Transit	DGSD
STRUCTURAL AND METALS			
Iron, Steel and Their Products			
322.	IS: 223-1950	Tensile Testing of Metals (Ferrous)	DGSD, CSO
323.	IS: 225-1950	Pig Iron (Charcoal)	CSO, DGSD
324.	IS: 226-1955	Structural Steel (*Revised*)	DGSD
325.	IS: 228-1952	Methods of Chemical Analysis of Pig Iron, Cast Iron and Plain Carbon and Low Alloy Steels (*Tentative*)	CSO
326.	IS: 429-1954	Methods of Testing Weight and Uniformity of Coating on Galvanized Iron and Steel Wires and Steel Sheets	CSO
327.	IS: 503-1953	Alloy Austenitic Manganese Steel Castings	CSO
328.	IS: 597-1955	Black Plate for Tinning, and Tin-Plate (*Tentative*)	CSO, DTD
329.	IS: 648-1955	Electrical Steel Sheets (*Tentative*)	CSO, DTD, DGSD
330.	IS: 649-1955	Methods of Testing Electrical Steel Sheets (*Tentative*)	CSO, DTD, DGSD
331.	IS: 727-1955	Hard Drawn Steel Wire for Springs (*Tentative*)	DTD
Non-Ferrous Metals and Alloys			
332.	IS: 26-1950	Tin Ingot (*Tentative*)	DTD
333.	IS: 292-1951	Brass Ingots and Castings (*Tentative*)	CSO, DGSD
334.	IS: 403-1952	Method of Chemical Analysis of Lead	CSO
335.	IS: 404-1952	Lead Pipes for Other Than Chemical Purposes	CSO
336.	IS: 406-1953	Methods of Chemical Analysis of Slab Zinc and Zinc Base Alloys	CSO
337.	IS: 440-1955	Methods of Chemical Analysis of Copper	CSO
338.	IS: 441-1955	Methods for Chemical Analysis of Brasses and Bronzes	DGSD, CSO
339.	IS: 504-1954	Methods of Chemical Analysis of Aluminium and Its Alloys	DGSD, CSO
340.	IS: 617-1955	Aluminium and Aluminium Alloy Ingots and Castings for General Engineering Purposes (*Tentative*)	DTD
341.	IS: 713-1955	High Purity Zinc and Zinc Base Alloy Ingots for Die Casting	DTD, DGSD
342.	IS: 737-1955	Wrought Aluminium and Aluminium Alloys Sheet and Strip	DTD
343.	IS: 742-1955	Zinc Base Alloy Die Castings	DGSD, DTD
Refractories			
344.	IS: 484-1953	Silica Refractories for General Purposes (*Tentative*)	CSO
345.	IS: 485-1953	Methods of Sampling and Testing of Refractory Materials (*Tentative*)	CSO
ELECTROTECHNICAL			
Electrical Equipment and Accessories			
346.	IS: 365-1952	Electric Hot Plates (*Tentative*)	DGSD, CSO
347.	IS: 366-1955	Electric Irons (*Tentative*)	DGSD, CSO
348.	IS: 367-1955	Electric Kettles for Domestic Use (*Tentative*)	DGSD, CSO
349.	IS: 369-1952	Electric Radiators for Domestic Use (*Tentative*)	CSO
350.	IS: 370-1954	Reversible Type Two-Pin Plugs and Socket-Outlets Without Earthing Connections (*Tentative*)	DTD
351.	IS: 371-1954	Two- and Three-Terminal Ceiling Roses (*Tentative*)	DGSD, CSO
352.	IS: 375-1951	Marking and Arrangement for Switchgear Bus-Bars, Main Connections and Auxiliary Wiring	DGSD, CSO
353.	IS: 395-1952	Lead-Acid Storage Batteries for Motor Vehicles, Light Duty (*Tentative*)	DGSD, CSO
354.	IS: 398-1953	Hard-Drawn Stranded Aluminium and Steel-Cored Aluminium Conductors for Overhead Power Transmission Purposes (*Tentative*)	CSO
355.	IS: 555-1955	Table-Type Electric Fans (*Tentative*)	DGSD
356.	IS: 586-1955	Leclanché Type Dry Cells for Telecommunication Signalling and General Purposes	CSO, DGSD, DTD
357.	IS: 693-1955	Varnished Cambric Insulated Cables for Electric Supply (*Tentative*)	DGSD
358.	IS: 694-1955	PVC Cables and Cords for Electric Power and Lighting for Working Voltages Up to and Including 650 Volts to Earth (*Tentative*)	DGSD, DTD
359.	IS: 722 (Part I & II)-1955	AC Whole-Current Electricity Meters	DGSD, CSO
Radio Equipment and Components			
360.	IS: 589-1954	Procedure for Basic Climatic Tests for Electronic Components (*Tentative*)	CSO, DTD
361.	IS: 590-1954	Fixed Paper Dielectric Capacitors (*Tentative*)	CSO, DTD
362.	IS: 591-1954	Low-Power, Low-Voltage Mains Transformers for Radio Receivers, Amplifiers, Small Transmitters and Similar Other Purposes (*Tentative*)	CSO, DTD

APPENDIX 4.3 — Indian Standards Adopted by Various Government Departments — *Contd*

Sl No.	No. and Title of Indian Standard		Adopting Authority/ies
(1)	(2)		(3)
Radio Equipment and Components — *Contd*			
363.	IS: 592-1954	Audio Output Transformers for Radio Receivers, Amplifiers, Small Transmitters and Similar Other Purposes (*Tentative*)	CSO, DTD
364.	IS: 614-1954	Methods of Measurements on Receivers for Amplitude Modulation Broadcast Transmissions (*Tentative*)	DTD
365.	IS: 615-1954	Recommendations for Minimum Electrical Performance Requirements for Domestic Radio Receivers (*Tentative*)	DGSD, CSO
366.	IS: 824-1956	Series of Preferred Values for Capacitors and Resistors	DTD
367.	IS: 825-1956	Colour Code for Fixed Resistors	DTD
MISCELLANEOUS			
Documentation			
368.	IS: 382-1952	Practice for Alphabetical Arrangement	CSO
369.	IS: 790-1956	General Structure of Preliminary Pages of a Book	DGSD
370.	IS: 791-1956	Half-Title-Leaf of a Book	DGSD
371.	IS: 792-1956	Title-Leaf of a Book	DGSD
372.	IS: 794-1956	Practice for Table of Contents	DGSD
373.	IS: 795-1956	Canons for Making Abstracts	DGSD
Unclassified			
374.	IS: 196-1950	Atmospheric Conditions for Testing	CSO, DGSD

APPENDIX 4.4

(*Item* 2.12.1)

CONTRIBUTIONS AND SUBSCRIPTIONS BY THE CENTRAL AND STATE GOVERNMENTS, ORGANIZATIONS, FIRMS AND INDIVIDUALS FOR THE CALENDAR YEAR 1956

	Rs	As	P	Rs	As	P	Rs	As	P
1. Contribution									
i) Government of India Grant-in-Aid	850 000	0	0				850 000	0	0
2. Membership Subscription									
a) Governments of States									
Bombay	10 000	0	0						
Uttar Pradesh	5 000	0	0						
West Bengal	4 000	0	0						
Bihar	2 500	0	0						
Madras	2 000	0	0						
Mysore	1 250	0	0						
Andhra	1 000	0	0						
Madhya Bharat	1 000	0	0						
Madhya Pradesh	1 000	0	0						
Orissa	Awaited								
Punjab	1 000	0	0						
Rajasthan	1 000	0	0						
Saurashtra	1 000	0	0						
Kerala	1 000	0	0						
Patiala & East Punjab States Union	500	0	0						
Delhi	375	0	0						
Ajmer	250	0	0						
Assam	250	0	0						
Bhopal	250	0	0						
Coorg	250	0	0						
Himachal Pradesh...	250	0	0						
Jammu & Kashmir	250	0	0						
				34 125	0	0			
b) Government of Neighbouring Country									
Ceylon	500	0	0	500	0	0			
c) Firms, Trade Associations, Non-Government Bodies, etc, paying more than the minimum									
Associated Cement Companies Ltd., Bombay ...	3 000	0	0						
Kalinga Tubes (Private) Ltd., Calcutta ...	3 000	0	0						
Tata Iron & Steel Co. Ltd., Bombay	3 000	0	0						
Delhi Cloth & General Mills Co. Ltd., Delhi ...	1 500	0	0						
C.P. Manganese Ore Co. Ltd., Nagpur	1 000	0	0						
	11 500	0	0	34 625	0	0	850 000	0	0

APPENDIX 4.4 — Contributions and Subscriptions — *Contd*

	Rs	As	P	Rs	As	P	Rs	As	P
B. F. ...	11 500	0	0	34 625	0	0	850 000	0	0
Federation of Indian Chambers of Commerce & Industry, New Delhi	1 000	0	0						
Philips India Private Ltd., Calcutta ...	1 000	0	0						
Sindri Fertilizers & Chemicals Private Ltd., Sindri ...	1 000	0	0						
D.C.M. Chemical Works, Delhi	750	0	0						
Ahmedabad Advance Mills Ltd., Bombay ...	500	0	0						
Alakli & Chemical Corporation of India Ltd., Calcutta	500	0	0						
Aluminium Industries Ltd., Kundara	500	0	0						
Ashok Leyland Ltd., Madras	500	0	0						
Assam Oil Co. Ltd., Digboi	500	0	0						
Bikaner Gypsums Ltd., Calcutta	500	0	0						
Braithwaite Burn & Jessop Construction Co. Ltd., Calcutta	500	0	0						
Burmah-Shell Oil Storage & Distributing Co. of India Ltd., Bombay	500	0	0						
Burmah-Shell Refineries Ltd., Bombay	500	0	0						
Central India Spinning, Weaving & Manufacturing Co. Ltd., Bombay	500	0	0						
Chandmull Rajgariah, Giridih	500	0	0						
Dalmia Cement (Bharat) Ltd., New Delhi ...	500	0	0						
Dunlop Rubber Co. (India) Ltd., Calcutta ...	500	0	0						
Engineering Association of India, Calcutta ...	500	0	0						
Ganges Rope Co. Ltd., Calcutta	500	0	0						
General Electric Co. of India Private Ltd., Calcutta ...	500	0	0						
Hindustan Aircraft Ltd., Bangalore	500	0	0						
Hindustan Motors Ltd., Calcutta	500	0	0						
Hindustan Vanaspati Manufacturing Co. Ltd., Bombay	500	0	0						
Imperial Chemical Industries (India) Private Ltd., Calcutta	500	0	0						
Imperial Tobacco Co. of India Ltd., Calcutta ...	500	0	0						
Indian Aluminium Co. Ltd., Calcutta	500	0	0						
Indian Iron & Steel Co. Ltd., Calcutta	500	0	0						
Indian Jute Mills Association, Calcutta	500	0	0						
Lever Bros (India) Ltd., Bombay	500	0	0						
Ludlow Jute Co. Ltd., Calcutta	500	0	0						
Madura Mills Co. Ltd., Madurai	500	0	0						
Mahindra & Mahindra Ltd., Bombay	500	0	0						
National Carbon Co. (India) Ltd., Bombay ...	500	0	0						
Sree Meenakshi Mills Ltd., Madurai	500	0	0						
Standard Batteries Ltd., Bombay	500	0	0						
Standard Vacuum Oil Co. Ltd., Bombay ...	500	0	0						
Standard Vacuum Refining Co. of India Ltd., Bombay	500	0	0						
Svadeshi Mills Co. Ltd., Bombay	500	0	0						
Tata Mills Ltd., Bombay	500	0	0						
Bata Shoe Co. (Private) Ltd., Calcutta ...	400	0	0						
Indian Copper Corporation Ltd., Ghatsila ...	400	0	0						
Lohia Brothers Ltd., Calcutta	375	0	0						
Associated Exports & Imports Corporation, Calcutta ...	350	0	0						
Bengal Chemical & Pharmaceutical Works Ltd., Calcutta	350	0	0						
Coal Consumers' Association of India, Calcutta ...	350	0	0						
Crompton Parkinson (Works) Private Ltd., Bombay...	350	0	0						
Estrela Batteries Ltd., Bombay	350	0	0						
Firestone Tyre & Rubber Co. of India Private Ltd., Bombay	350	0	0						
Gladstone Lyall & Co. Ltd., Calcutta	350	0	0						
Indian Electric Works Ltd., Behala	350	0	0						
Killick, Nixon & Co. Private Ltd., Bombay ...	350	0	0						
Metal Box Co. of India, Calcutta	350	0	0						
C. C. Wakefield & Co. Ltd., Bombay	350	0	0						
Williamson Magor & Co. Ltd., Calcutta ...	350	0	0						
Angelo Brothers Ltd., Calcutta	300	0	0						
Associated Stone Industries (Kotah) Ltd., Ramganj Mandi	300	0	0						
Association of Merchants & Manufacturers of Textile Stores & Machinery, Bombay	300	0	0						
Atlas Cycle Industries, Sonepat	300	0	0						
British Metal Corporation (India) Private Ltd., Calcutta	300	0	0						
Chittaranjan Cotton Mills Ltd., Calcutta ...	300	0	0						
Chloride & Exide Batteries (Eastern) Private Ltd., Calcutta	300	0	0						
Electrical Storage Co. Ltd., Calcutta	300	0	0						
Gammon India Ltd., Bombay	300	0	0						
Glenfield & Kennedy Ltd., Bombay	300	0	0						
Indian Galvanizing Co. (1926) Ltd., Calcutta ...	300	0	0						
Indian Rope Manufacturers' Association, Calcutta ...	300	0	0						
Indien-Gemeinschaft Krupp-Demag G.m.b.H., New Delhi	300	0	0						
	42 025	0	0	34 625	0	0	850 000	0	0

APPENDIX 4.4 — Contributions and Subscriptions — *Contd*

	Rs	As	P	Rs	As	P	Rs	As	P
B. F. ...	42 025	0	0	34 625	0	0	850 000	0	0
James Lord & Sons Ltd., Calcutta	300	0	0						
Metal Rolling Works Private Ltd., Bombay ...	300	0	0						
Pakur Quarry Owners' Association, Calcutta ...	300	0	0						
Sen Raleigh Industries of India Ltd., Calcutta ...	300	0	0						
Sidhpur Mills Co. Ltd., Bombay	300	0	0						
Aluminium Manufacturing Co. Private Ltd., Calcutta	275	0	0						
Behar Firebricks & Potteries Ltd., Mugma ...	275	0	0						
Coke Oven Construction Co. Private Ltd., Calcutta	275	0	0						
Das & Company, Bombay	275	0	0						
Gannon Dunkerley & Co. Ltd., Bombay ...	275	0	0						
Jauhar Fire Bricks & Refractory Works Private Ltd., Mugma	275	0	0						
Laxmi Starch Factory Ltd., Kundara	275	0	0						
Sankey Electrical Stampings Private Ltd., Bhandup	275	0	0						
Indian Implements Manufacturing Co. Ltd., Aligarh	256	0	0						
Federation of Gujarat Mills & Industries, Baroda ...	251	0	0	46 232	0	0			
d) Other Sustaining Members at Rs 250/- each ...				239 193	0	0			
e) Sustaining Members (Associates)				13 300	0	0			
f) Ordinary Members				2 382	0	0			
Total Subscription							335 732	0	0
Grand Total							1 185 732	0	0

APPENDIX 4.5

(*Item* 2.13.3)

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31 MARCH 1957

RECEIPTS

Sl No.	Heads of Receipts	Amount Rs	As	P	Amount Rs	As	P
1.	Opening Balance:						
	i) Cash and Bank Balances	681 385	6	8			
	ii) Deposits	650 000	0	0	1 331 385	6	8
2.	Subscriptions:						
	i) for 1956 (including Rs 260/- for 1955)				141 259	2	0
	ii) for 1957 (including Rs 25/- for 1958)				211 684	3	5
3.	Recovery of Bills for Sale of Publications				151 676	4	9
4.	Certification Marks Fees and Inspection Charges				13 594	13	6
5.	Contribution by ISI Employees to CHSS				4 035	0	0
6.	Interest on Deposits and other Investments				286	3	0
7.	Miscellaneous Receipts				7 773	2	0
8.	Advertisements in ISI Bulletin				19 704	1	0
9.	Delegation Fees for International Conference				3 605	3	0
10.	Government Grant for Recurring Expenditure				850 000	0	0
					2 735 003	7	4
11.	Miscellaneous Credits				114 322	3	6
	Total				2 849 325	10	10

PAYMENTS

Sl No.	Heads of Expenditure	Amount Rs	As	P
1.	Pay of Officers	306 313	3	0
2.	Allowances of Officers	42 437	8	0
3.	Provident Fund Contribution of Officers: i) Interest	10 793	0	0
	ii) Contribution	19 727	12	0
4.	TA for: i) Officers	67 993	13	9
	ii) Committee Members	9 039	12	0
5.	Pay of Establishment	234 808	4	0
6.	Allowances of Establishment	175 169	12	0
7.	Provident Fund Contribution for Staff: i) Interest	4 456	0	0
	ii) Contribution	16 393	0	0
8.	TA for Staff	13 293	5	0
9.	Subscription for ISO & IEC	15 201	13	0
10.	Printing	147 084	10	9
11.	Other Charges: i) Stationery	63 347	13	0
	ii) Postage and Telegrams	48 553	14	0
	iii) Library: a) Publications	15 962	7	3
	b) Other Expenses	2 430	2	6
	iv) Telephones	19 040	13	9
	v) a) Furniture	10 542	11	3
	b) Office Equipment	48 055	5	0
	vi) Rent of Building	18 960	0	0
	vii) Electric and Water Charges	4 175	7	0
	viii) Miscellaneous	32 665	9	6
	ix) Advertisement	8 830	10	3
	x) Audit Charges	884	8	0
	xi) Medical Relief	15 382	9	0
	xii) Maintenance of Staff Car	3 541	5	0
12.	Conferences: i) National	—		
	ii) International	21 844	4	6
13.	Exhibition	—		
14.	Testing Charges: i) Research and Consultation	2 158	2	0
	ii) Certification Testing	348	1	0
		1 379 435	8	6
15.	Miscellaneous Remittances	441 021	9	0
16.	Closing Balances: i) Deposits	550 000	0	0
	ii) Cash & Bank Balances	478 868	9	4
	Total	2 849 325	10	10

APPENDIX 4.5 — *Contd*

(*Item* 2.13.3)

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31 MARCH 1957

EXPENDITURE

Sl No.	Heads of Expenditure	Amount Rs	As	P
1.	Pay of Officers	307 323	3	0
2.	Allowances of Officers	42 437	8	0
3.	Provident Fund Contribution of Officers: i) Interest	10 793	0	0
	ii) Contribution	21 001	12	0
4.	TA for: i) Officers	67 993	13	9
	ii) Committee Members	9 039	12	0
5.	Pay of Establishment	234 808	4	0
6.	Allowances of Establishment	175 169	12	0
7.	Provident Fund Contribution for Staff: i) Interest	4 456	0	0
	ii) Contribution	16 393	0	0
8.	TA for Staff	13 293	5	0
9.	Subscription for ISO & IEC	15 201	13	0
10.	Printing	124 770	5	9
11.	Other Charges: i) Stationery	66 716	7	0
	ii) Postage & Telegrams	47 156	0	3
	iii) Library: a) Publications	—		
	b) Other Expenses	2 475	0	6
	iv) Telephones	19 040	13	9
	v) a) Furniture	—		
	b) Office Equipment	1 737	10	9
	vi) Rent of Building	18 960	0	0
	vii) Electric and Water Charges	4 175	7	0
	viii) Miscellaneous	33 042	12	1
	ix) Advertisement	8 830	10	3
	x) Audit Charges	1 984	8	0
	xi) Medical Relief	15 382	9	0
	xii) Maintenance of Staff Car	3 541	5	0
	xiii) Depreciation	19 798	2	9
12.	Conferences: i) National	—		
	ii) International	22 646	13	6
13.	Exhibition	—		
14.	Testing and Research: i) Research and Consultation	2 158	2	0
	ii) Certification Testing	348	1	0
		1310 675	15	4
	Excess of Income Over Expenditure	36 641	6	8
	Total	1347 317	6	0

INCOME

Sl No.	Heads of Income	Rs	As	P	Amount Rs	As	P
1.	Income Other than Government Grant:						
	i) Subscription:						
	a) Collection during 1956-57	141 267	6	0			
	b) Collection during 1955-56	194 464	6	0			
					335 731	12	0
	ii) Sale Proceeds of ISI Publications (Net)				82 004	2	9
	iii) Commission on Sale of Publications Other than ISI Publications (Net):						
	a) Miscellaneous	651	6	3			
	b) ICE	12	15	0			
	c) ASTM	591	7	0			
	d) ASA	137	3	6			
	e) SAA	32	15	6			
	f) IEC	393	15	6			
	g) ISO	11	2	0			
	h) IRS	368	3	0			
	i) BSI	24 230	8	0			
					26 429	11	9
	iv) Certification Marks Fees and Inspection Charges				13 594	13	6
	v) Contribution by ISI Employees to CHSS				4 035	0	0
	vi) Interest on Call Deposits and Other Investments				286	3	0
	vii) Miscellaneous Receipts				7 975	2	0
	viii) Advertisement in ISI Bulletin				23 655	6	0
	ix) Delegation Fees for International Conference				3 605	3	0
					497 317	6	0
2.	Government Grant				850 000	0	0
	Total				1 347 317	6	0

APPENDIX 4.5 — *Contd*

(*Item* 2.13.3)

BALANCE SHEET AS AT 31 MARCH 1957

LIABILITIES

Sl No.		Rs	As	P	Amount Rs	As	P
1.	Advance Subscription for 1957 (including Rs 25/- for 1958)				211 686	6	0
2.	Contributory Provident Fund:						
	i) Opening Balance	389 697	0	0			
	ii) Add Subscription less withdrawals during the year	70 878	0	0			
	Total	460 575	0	0			
	iii) Add Contribution (less refunds) by the ISI during the year	29 506	0	0			
		490 081	0	0			
	iv) Add Interest	15 044	0	0			
					505 125	0	0
3.	Sundry Creditors:						
	i) Inland	56 703	10	9			
	ii) Abroad	49 234	12	6			
					105 938	7	3
4.	ISI Building Fund:						
	i) Collection up to 31-3-56	951 563	15	9			
	ii) Collection during 1956-57	190 923	10	6			
					1 142 487	10	3
5.	Excess of Income Over Expenditure:						
	i) Balance Brought Forward	552 935	8	3			
	ii) Less Amount Transferred to Building Fund	36 000	0	0			
		516 935	8	3			
	iii) Add Excess During the Year	36 641	6	8			
					553 576	14	11
	Total				2 518 814	6	5

ASSETS

Sl No.		Rs	As	P	Amount Rs	As	P
1.	Cash: i) At the Bank:						
	a) State Bank of India, Delhi/Calcutta	456 378	2	4			
	b) Bank of Baroda Ltd., Bombay	21 293	9	0			
		477 671	11	4			
	ii) In Office (Including Imprest) Delhi/Bombay/Calcutta	1 196	14	0			
	iii) Postage Stamps	2 060	4	6			
					480 928	13	10
2.	Investments: i) Fixed Deposits	550 000	0	0			
	ii) Contributory Provident Fund:						
	a) National Savings Certificates	420 000	0	0			
	b) Balance of Loans with Members	16 944	0	0			
	c) Balance in Bank	68 181	0	0			
					1 055 125	0	0
3.	Sundry Debtors: i) Advances to Staff:						
	a) Conveyance	25 649	0	0			
	b) Miscellaneous	4 403	14	9			
	ii) Deposits:						
	a) P & T Department	50	0	0			
	b) Calcutta Electric Supply Corpn. Ltd., Calcutta	25	0	0			
	iii) Others	74 546	4	2			
					104 674	2	11
4.	Stock: i) Printing Paper in Hand	46 375	5	0			
	ii) Library Books	71 407	2	11			
	iii) Furniture and Office Equipment	164 215	11	6			
					281 998	3	5
5.	Staff Car and Accessories				8 905	9	0
6.	ISI Building Project (Construction and Preliminary Expenses):						
	a) As at 31-3-56	184 002	8	3			
	b) During 1956-57	399 615	1	0			
					583 617	9	3
7.	Expenses Prepaid: i) Deputy Controller of Stationery, Calcutta	2 565	0	0			
	ii) Surveyor General of India	1 000	0	0	3 565	0	0
	Total				2 518 814	6	5

I certify that I have obtained all the information and explanations that I required and that subject to the remarks in the Audit Report, the balance sheet exhibits, in my opinion, the true financial position of the ISI according to the best of my information and the explanations given to me and as shown by the books of the ISI.

Sd. M. R. Prem
Assistant Audit Officer

Sd. Harbans Lal
Secretary (Administration)

(*Continued from cover page* 2)

STAFF

(As on 31 March 1957)

Director : LAL C. VERMAN

Joint Director : A. N. GHOSH

Technical Officer : T. PURNANANDAM

ENGINEERING DIVISION

Deputy Director	J. P. MEHROTRA
Assistant Director	M. V. PATANKAR
Technical Officer	VACANT
Section Officer	CHANDAR SAIN

TEXTILE DIVISION

Deputy Director	MAHARAJ KISHEN
Technical Officer	R. S. PRAYAG
Technical Officer	T. BALAKRISHNAN

AGRICULTURAL AND FOOD PRODUCTS DIVISION

Assistant Director	C. N. MODAWAL
Technical Officer	P. H. RAMANATHAN

ELECTROTECHNICAL SECTION

Assistant Director	VACANT
Technical Officer	S. SRINIVASAN

CERTIFICATION MARKS SECTION

Deputy Director	D. V. KARMARKAR
Technical Officer	A. S. CHEEMA
Technical Officer	SUNIL K. GHOSE
Technical Officer	VACANT
Section Officer	V. S. MATHUR

PUBLIC RELATIONS SECTION

Assistant Director	B. L. BHATIA

ADMINISTRATION SECTION

Secretary	HARBANS LAL
Section Officer (Admn)	P. CHATTERJEE
Section Officer (Accounts)	G. L. BHATIA

BUILDING DIVISION

Deputy Director	C. S. CHANDRASEKHARA
Technical Officer	S. P. RAMAN
Technical Officer	VACANT

CHEMICAL DIVISION

Deputy Director	K. L. MOUDGILL
Deputy Director	SADGOPAL
Assistant Director	S. KRISHNAMURTHY
Technical Officer	D. DAS GUPTA
Technical Officer	V. B. MAINKAR
Section Officer	K. P. KHANNA

STRUCTURAL AND METALS DIVISION

Officer on Special Duty	T. V. JOSEPH
Assistant Director	B. S. KRISHNAMACHAR
Assistant Director	VACANT
Technical Officer	D. AJITHA SIMHA
Technical Officer	H. N. KRISHNAMURTHY
Technical Officer	H. C. SHARMA
Technical Officer	VACANT

STATISTICAL SECTION

Assistant Director	A. K. GUPTA
Technical Officer	B. N. SINGH

PUBLICATIONS SECTION

Chief Editor	JAINATH KAUL
Technical Officer	G. L. GULATI
Engineer Draftsman	S. P. BATTOO
Technical Translator (Hindi)	G. P. SRIVASTAVA
Technical Translator (Foreign Languages)	P. C. DE
Librarian	SOBI SINGH

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Assistant Director — A. B. RAO

BRANCH OFFICE, CALCUTTA

Assistant Director — S. K. SEN

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Sanitary Appliances and Water Supply Fittings
Refrigeration and Air-Conditioning
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