

## Representatives' Reports

*Brighton College of Technology: Advisory Committee for Mechanical and Electrical Engineering.*

Representative: F. M. Marshall, B.Sc.

A meeting of the above Committee was held on 28th October 1966.

One of the chief matters under discussion concerned proposals for the purchase of new engineering equipment for the financial year 1966-1967, within the limit of £50 000 set by the Finance Committee of the Brighton Corporation for furniture and equipment for the College as a whole over the period concerned. The recommendations of the Heads of the Mechanical and Electrical Engineering Departments were accepted by the Advisory Committee. At the Committee's previous meeting on 25th March 1966, the hope was expressed that a similar limitation would not be imposed in future years in view of the continuing need for technological developments.

The question of separate Advisory Committees for Electronic and Electrical Engineering, and for Mechanical Engineering, was also considered. The Committee decided that separate committees need not be established and that any special requirements to be considered in the separate fields could well be handled by *ad hoc* working groups or sub-committees which could be arranged for any specific purposes.

The Institute's representative has had some personal discussion with the Head of the Mechanical Engineering Department on the organization of the syllabus for the proposed degree course in production engineering. Interest was expressed in the lecturing of the representative at meetings of the Institute of Works Managers and on management courses on value engineering and standardization and it was proposed that he should give some special lectures at the College next session.

*British National Committee on Materials.*

Representative: R. Cook, M.Sc.

A Working Party has examined the question of correlating material data. A three-day symposium, under the aegis of the Committee is to be held at Southampton in July 1967, dealing with the acoustic properties of materials. A directory of testing establishments has been compiled.

*British National Committee for Non-destructive Testing.*

Representative: J. McAfee.

The Committee continues to be formed from representatives of twenty-four technical institutions and societies plus two co-opted members. Five meetings were held during the year. The principal subjects discussed at these meetings included the possible formation of a National Centre for Non-destructive Testing, liaison with other bodies engaged in non-destructive testing, the setting up of a Working Party to determine the requirements of industry and preliminary work in connexion with the Fifth International Conference to be held in Canada in 1967. Educational problems were also discussed.

*City and Guilds of London Institute: Advisory Committee on Shipbuilding, Ship Joinery, Yacht and Boat Building.*

Representative: P. J. Howard, B.Sc.

Consideration is being given to the need for amendment to the Part II Shipbuilding Technicians course to provide for specialists such as draughtsmen for whom the present course is

unsuitable. Discussion will take place with the Shipbuilding Industry Training Board.

Further consideration is being given to provision for studies at Part III level.

*Committee on Regulations for the Electrical and Electronic Equipment of Ships.*

Representative: A. N. Savage.

One meeting was held during 1966 to elect delegates to the International Electro-technical Commission meeting to be held in Leningrad, and to agree to the United Kingdom being approached as to the various items on the agenda.

The Committee has studied the Draft British Standards Specification for circuit breakers in distribution boards for low and medium voltages and have submitted their comments regarding the application of such boards for marine systems.

*East Ham Technical College: Engineering Advisory Committee.*

Representative: R. M. Duggan, M.A.

The new Committee was reconstituted in March 1966 and reports to the Governing Body of the College.

The present representation consists of:

Borough of Newham—One Alderman and three Councillors.

Local Employers—Four representatives.

and one representative from each of the following organizations:

Post Office Engineering Department.

Amalgamated Engineering Union.

Electrical Trades Union.

United Society of Boilermakers, Shipbuilders and Structural Workers.

The Institution of Electrical Engineers.

The Institution of Electronic and Radio Engineers.

The Institute of Marine Engineers.

The Institution of Mechanical Engineers.

The Institution of Production Engineers.

The Principal and his heads of mechanical and electrical engineering departments respectively attend *ex officio*.

Three meetings have been held in 1966, in March, July and December.

The total number of mechanical and electrical engineering students enrolled is now almost 3800, which indicates a steady rate of increase of about 15.7 per cent per annum. The proportion of mechanical and electrical engineering students is evenly divided, although the present trend is for the number of mechanical engineering students to increase at the greater rate.

This rapid expansion has necessitated the appointment of a considerable number of extra staff as well as normal replacement.

The vigorous attitude of experimenting with new courses has been maintained by the College, with varying success. One significant feature has been the big increase in Block Release enrolments, which is probably a reflection on the activities of the Engineering Training Board and the impact of the levy scheme.

The formation of the London Borough of Newham has introduced many problems and, with three technical colleges in the new Borough, a scheme of rationalization of courses was

## Annual Report of the Council for 1966

essential to avoid duplication. Re-allocation of space and facilities will take 18 months.

The examination results illustrate that the College is maintaining its high standard of education and of mechanical engineering in particular. The pass percentage was well above the national average, with three students displaying outstanding merit in open competition.

As a result of the formation of the Council of Engineering Institutions the College staff and the Engineering Advisory Committee expressed considerable concern at the closing of the route to membership of professional Institutions through the National Certificate course. It had, however, provided an opportunity to revise the existing schemes for Higher National Certificates in aeronautical, mechanical and production engineering, to divorce them from the requirements of the Institutions and to provide more relevant and up to date syllabuses for study. The new rules and syllabuses are under active study by the College and the Principal has established that the Institutions, other than those having Council of Engineering Institutions membership, were willing to accept the new Higher National Certificate as a suitable route of membership. Three members of the C.E.I. had also been approached but only one Institution expressed its support for membership through the National Certificate course. It was anticipated that the demands of the new course and of the Mechanical Engineering Technicians Course would require staff to keep more in contact with industrial developments, and the Committee supported the proposal for staff to be seconded to industry for periods of about one month. It is hoped that some marine engineering organizations will give practical support to this proposal.

### *Engineering Institutions Examinations Standing Committee for Part 1.*

Representative: C. H. Taylor-Cook, B.Sc.

The work of the Committee during 1966 has been overshadowed by the advent of the Council of Engineering Institutions examinations. It has been agreed that the last Part I examination under the present regulations be held in October 1968 at centres in the United Kingdom and abroad in the Southern Hemisphere, also in the Northern Hemisphere for repeat or referred candidates from the April 1968 examination only.

The normal work of conducting the examination has been continued.

### *Grimsby College of Further Education: Engineering Advisory Committee.*

Representative: R. L. Rawlings.

The College shows a high standard of up to date equipment and well-qualified and co-operative staff, all housed in convenient, modern buildings. However, the need for further accommodation and equipment has been discussed at some length, particularly on the basis of short or long term forward planning in the light of present building restrictions.

It now appeared that in order to achieve entry qualifications to Council of Engineering Institutions, courses could only be provided on a full time or sandwich course basis. The breaking of the links between part-time studying and membership of corporate institutions was deplored by the Committee and it was hoped that progress would be made concerning a proposal that part-time courses be organized for post-H.N.C. students leading to Part 1 C.E.I. examinations. That it should be possible for a conscientious part-time day student to take a course which leads to Part 1 C.E.I. examination or to take endorsement subjects after completing an H.N.C. course was forcibly suggested by the representative of the Institute.

The Committee felt strongly that with the equipment and material available in this area, there would not need to be any lowering of standards in order to achieve and maintain regular interest in part-time students becoming Corporate members of the Institute of Marine Engineers, but should students have to leave the area in order to obtain C.E.I. qualifications then obviously the Institute was likely to penalize itself on this count.

It will be borne in mind that the Humberside area, of which Grimsby is a part, suffers from lack of easy communications with other recognized marine engineering centres.

### *Institute of Petroleum: Medium and Low Speed Diesel Engines Sub-Panel.*

Representative: J. Calderwood, M.Sc.

The name of the Panel has now been altered to Crosshead Diesel Engine Sub-Panel. During the year one meeting was held of the Institute of Petroleum Engine Tests of Lubricants Panel and one meeting of the corresponding Co-ordinating European Council (C.E.C. is the joint European body dealing with this subject).

The work of the English Panel, which was reported to C.E.C., has been confined to a detailed investigation, with the help of B.S.R.A., into troubles in service that could be ascribed to the quality of lubricating oil. Although many troubles were reported in single instances the only fairly common trouble was early rejection of oil due to oxidation.

As a result of the work done in this country the C.E.C. have now set up a Sub-Committee with Mr. J. K. Locke of BP as Chairman. The investigation was carried out jointly by Mr. Locke, Mr. J. Morrison of B.S.R.A., and the representative of the Institute.

### *Institute of Welding.*

Representative: T. A. Rush.

Progress in welding research and practice is covered by the monthly editions of the British Institute of Welding issued during the year.

### *International Institute of Refrigeration: Standing Committee.*

Representative: K. C. Hales, M.A.

The Ministry of Technology's Standing Committee met once in 1966. The main subject was the structure of the various sections of the International Institute in relation to any changes that should be recommended at the next Congress to be held in Madrid in 1967.

### *Joint British Committee for Stress Analysis.*

Representative: B. Hildrew, M.Sc.

During 1966 the Third International Conference on Stress Analysis was held in Berlin. Representatives of the British Committee attended and on completion of the meeting a proposal was adopted that the Fourth International Conference should be held in the United Kingdom in September 1970. The Council of the Institution of Mechanical Engineers have agreed to sponsor these arrangements.

An informal meeting on Three Dimensional Stress Analysis was held at the Institution of Mechanical Engineers in February 1966. The attendance was satisfactory and an interesting discussion resulted.

In March 1966 a Stresses in Service Conference was held at the Institution of Civil Engineers. This proved very successful with attendance exceeding two hundred.

The Institute of Physics and the Physical Society sponsored a meeting at Oxford in September, on the Physical Basis of Fracture.

The Committee's bulletin, the J.B.C.S.A. News, was issued during February and September and circulated free of charge to the mailing list, which now exceeds 1500. The first volume of the Journal of Stress Analysis was completed in October 1966 with Issue Number 5. The volume contains forty-one papers, the quality of which is indicated by the rapid increase in world sales.

Three meetings on Model Analysis are planned. The first at University College on 2nd January 1967. Meetings in course of arrangement include the two further meetings on Model Analysis at University College in April and June. A Conference on Concrete Pressure Vessels has been arranged to take place on 13th-17th March 1967, at the Institution of Civil Engineers. Over seventy papers are to be presented. A sym-

## Annual Report of the Council for 1966

posium on Finite Element Techniques and Application is to be held at the University of Birmingham on 13th April 1967 and a conference on New Concepts in Stress Analysis is being arranged for 1968.

### *Liverpool Regional College of Technology: Mechanical, Marine and Production Engineering Advisory Committee.*

Representative: T. E. Jones.

The move, in September 1965, of the marine section from its temporary accommodation in the Royal Liver Building, back to the College proper, has made possible a number of changes and improvements in the work of the marine engineering division. The biggest change, the abandoning of the "casual entry" system and the introduction of courses, in both parts of both classes, with starting dates at intervals of six weeks, has shown considerable benefits for the staff, and the College is confident that it will be reflected equally in the examination results of the students.

This alteration would not have been possible without the co-operation of shipowning firms, who, without exception, have arranged for their engineer officers to be granted leave for the periods for which courses are run. Students are undertaking a great deal more laboratory work, as this also has been made easier by the move back to the College. Another innovation which has proved extremely popular is a series of lectures given by the Department of Industrial Administration and Liberal Studies on "Man Management" for master and chief engineer students.

A scheme for a Council for National Academic Awards degree in marine engineering has been submitted to the appropriate body and awaits approval. Such a course appears to fill an existing gap in marine education and support should be forthcoming. In the meantime, the division now has the responsibility of teaching marine engineering to students taking the degree course in nautical studies, the first occasion on which it has been concerned with teaching other than for Board of Trade Certificates.

Research work by staff has also been made possible by the return of the division to the College.

### *Lloyd's Register of Shipping: Technical Committee.*

Representatives: J. G. Robinson and Captain W. S. C. Jenks, O.B.E., R.N.

It is intended to divide the Society's Rules for Materials into those for hull construction and those for the construction of boilers, pressure vessels and machinery. The latter will form a new Chapter Q, a draft of which was considered by a specialist panel whose recommendations were accepted by the Technical Committee. This will be published in mid 1967, when a revised Chapter P relating to hull material and a revised Chapter J, for boilers and other pressure vessels, will be ready. The new Chapter Q will be related to I.S.O. requirements and its re-designed layout will facilitate reference and application.

A revision of the rules relating to reduction gearing for propelling and auxiliary machinery has been completed whereby this section now includes limits for surface hardened and oil engine gears.

After study by the Oil Engine Panel of the Technical Committee, revised rules for crankshafts for use in vee engines were prepared following investigations into the effects of variation in i) firing orders and firing intervals, ii) range of geometrical propositions, iii) inertia effects of reciprocating masses, iv) cylinder pressure variations.

The revision of the Rules for dry cargo ships over 295 feet in length has now been completed with new sections relating, *inter alia*, to machinery spaces, steering gear, strengthening for navigation in ice, hatchways and deck openings structural details, cantilevers and longitudinal strength in way of erections.

Three further sections have been added to the Society's code of practice for the construction and survey of ship's cargo handling gear. These sections relate to winches, determination of forces and loads in the system and derrick cranes.

As a result of the work of the International Tanker Equipment Standing Committee, ullage plugs and tank cleaning openings are now prohibited in enclosed spaces on new ships.

Owing to the increasing size of tankers and changes in design, fresh rules have been written for the fore end structural requirements and the remaining Rules have been rationalized.

Other minor amendments were made to the Society's Rules relating to longitudinal strength, steel wire ropes and bilge and ballast flooding alarms for engine rooms not intended to be continuously manned.

As a contribution towards the development throughout the world of hovercraft guidance notes and provisional requirements for the classification of these air cushion vehicles were studied by a technical panel. It is the intention to publish these notes early in 1967.

### *Parliamentary and Scientific Committee.*

Representative: R. Cook, M.Sc.

There have been eight meetings of the General Committee during the year at which discussions have taken place on the following subjects: Fisheries Research, Developments in regard to Anti-biotics and Control of Infection, Air Pollution, the Social Science Research Council, Road Safety Research, Technical Information Services and Migration of Scientists.

### *Permanent International Association of Navigation Congresses—British National Committee.*

Representative: D. R. M. Barwell.

During the year a Working Party has studied the terminals already constructed and under construction at United Kingdom ports and elsewhere and the findings have been submitted to the British National Committee with a view to presentation to the Permanent International Commission in Brussels.

A six point summary of the report is as follows:

- i) Of existing services, the diversity of designs of shore facilities and the vessels using them severely limits the degree of interchangeability between terminals and ships of different companies.
- ii) Those existing terminals designed for use by larger vessels offer greater adaptability than those for smaller vessels, the former usually having a longer bridge ramp which could be more easily modified.
- iii) Existing terminals for smaller vessels would probably require costly modifications for improved interchangeability and it is unlikely that operators or terminal authorities would consider the expenditure worth while.
- iv) A system of classification of all existing terminals (U.K. and Continental) should be prepared.
- v) Some modification to a number of vessels in service would improve the range of interchangeability with existing terminals.
- vi) The characteristics of the design of future terminals and vessels should be put forward to port authorities and shipping companies as the basic specification of berthing conditions and requirements for standardization of services.

The full Working Party report is published by "Dock and Harbour Authority", London, 1966.

### *Plymouth College of Technology: Advisory Committee for Civil and Marine Engineering.*

Representative: Commander W. Farrell, M.B.E., R.N.

At the College at the present time, there are ninety-five full time marine engineering students of whom fifty-five are taking a two-year Ordinary National Diploma Course which gives exemption from Part A of the Second and First Class Board of Trade Certificates of Competency.

The remaining forty students are taking a two-year course preparing them for the Part A examination.

The students, who wear uniform, live in hostels and are subject to the same standards of discipline and behaviour as their counterparts in the School of Navigation.

## Annual Report of the Council for 1966

Except for marine engineering subjects, marine engineering and nautical students have a common course in mathematics, physics, and liberal studies and all take part in parades, drill, boatwork and sports activities.

The Head of the Mechanical and Marine Engineering Department, Mr. D. R. S. Rabley, B.Sc. (Member) is responsible for marine engineering, and the Head of the Navigation School for the training, hostels and discipline of the marine engineering students; Mr. A. J. Weddle (Member), a senior lecturer in marine engineering deals with co-ordinating duties.

This method of training seems very satisfactory and should break down all the old barriers between "deck" and "engineer" officers and give to each a sense of the responsibility of the tasks of those at sea.

### *Poplar Technical College, Board of Governors.*

Representative: D. G. Alcock.

The representation of the Institute upon the Board of Governors continued throughout the year and the Institute's representative has recently relinquished his two-year period of office as Chairman of the Governing Body. As previously reported the College is still whole-heartedly co-operating in the training of marine engineers but undoubtedly the efforts of the staff and College personnel are circumscribed due to lack of hostel accommodation for both senior and junior students. Additionally some complications are arising due to the implications of the white paper "A Plan for Polytechnics and other Colleges". It would seem that the Inner London Education Authority have made proposals for establishing five new Polytechnics within their area from a total of thirteen area Colleges. Poplar Technical College is not included amongst those enumerated but there are some vague references about a new Nautical College. It would seem that marine engineering within the Capital of this country is not being given reasonable consideration, however, the Governors of Poplar Technical College are alert to this situation and are seeking support for tuitional facilities for marine engineering in general.

### *Southampton College of Technology, Department of Marine Engineering.*

Representative: A. G. Pemberton.

The Engineering and Science Advisory Committee met on 23rd May and 31st October 1966, both meetings were attended by the representative.

The reports submitted by the Head of the Department of Marine Engineering indicate that the courses provided for marine engineers are well supported and the examination successes achieved have been very satisfactory.

The possibility of establishing a Higher National Diploma in marine engineering has been discussed and would have the support of the Committee should this proposal eventually materialize.

In this connexion it is noted that the College already provides H.N.D. courses in naval architecture and production engineering.

Re-organization of the departmental structure of the College has resulted in segregation of craft and technician courses under a new Department of General Engineering based on the old St. Mary Street Technical College.

A new department of mathematics and computation has been established for the servicing of the departments based on the College of Technology.

A re-arrangement of the Advisory Committee is also being considered by the Governors and it appears that the objective is to have separate Committees for the two establishments.

At present, courses in naval architecture are controlled under the Department of Mechanical and Production Engineering, whereas it would seem more appropriate to associate them with the Department of Marine Engineering, in order to obtain proper co-ordination of education and training for the ship-building and marine engineering industry. Such co-ordination would require the close support of both R.I.N.A. and I.Mar.E. together with the industry in which, of course, shipowners would necessarily be included.

### *United Kingdom Automation Council.*

Representatives: H. E. Upton, O.B.E., and J. Stuart Robinson, M.A.

The present membership, as at last year, still stands at thirty-seven.

An application panel has been established; the terms of reference have not yet been finally determined but are likely to cover consideration of the possibilities of increasing the application of known aspects of automation and of making recommendations.

The education and training panel has extended membership which has increased the potential of the panel for co-ordinating the efforts of the various bodies which are active in the same, or related, fields of endeavour. This potential has been exploited and efforts to promote even closer co-operation will continue.

The research and development panel held a successful conference on Automatic Warehousing, on 28th October 1965. It aroused much interest and was in fact, over-subscribed. The panel instigated the compilation of a report on sources of information and advice available on automation technology which will be published shortly as an SIRA report.

During the year the subject of automatic assembly was investigated by the panel and as a result a conference organized by the Institution of Production Engineers on behalf of U.K.A.C., is to be held on 3rd-4th January 1967, in Nottingham.

The foreign relations panel continued to be active in the international sphere.

### *Third International Federation of Automatic Control Congress, London 20th-25th June 1966.*

H.R.H. The Prince Philip, Duke of Edinburgh, opened the Congress which was attended by some 1800 people from thirty-five countries. Thirty-three of the 289 pre-printed papers were presented by British authors. A Presidential Address by Professor J. F. Coales, and survey papers by Professor J. H. Westcott, Professor H. H. Rosenbrock and Mr. A. J. Young were presented. At the closing session the Minister of Technology, the Rt. Hon. Frank Cousins, M.P., addressed the delegates and at the Congress Banquet the Prime Minister, the Rt. Hon. Harold Wilson, M.P. was the principal guest.

### *International Measurements Confederation (IMEKO).*

An invitation has been extended to IMEKO to sponsor jointly with IFAC the Symposium on "Industrial Measurement Techniques for On-line Computers" planned for 1968. If this invitation is accepted the symposium will be the first occasion on which these two international federations have collaborated in sponsoring a meeting.

### *Technological Programme Forward-planning Panel.*

The panel will provide, at the earliest planning stage of technological meetings, conferences etc., to be held by member societies either individually or jointly in the fields of automatic control and computation, a forum to foster adequate coverage of these subjects and minimize clashes and duplication of effort, and to report from time to time to the Executive Committee of the U.K.A.C.

Professor J. R. N. Stone, C.B.E., M.A., of the Department of Applied Economics, University of Cambridge, has accepted the invitation of the Chairman to deliver the sixth U.K.A.C. Annual Lecture on the subject of "Our Unstable Economy; can planning succeed".

In conclusion the Executive Committee believe that governmental measures directed to improving the present economic situation will prove largely abortive unless the hope for redeployment of labour is coupled with an investment in capital equipment, particularly directed to an increase in automation; unless incentives designed to promote the provision of such equipment on industry on a widespread scale are intensified, the present limitation of credit is certain to prevent this and thus, lay the groundwork for a more serious economic balance of payments crisis in a few years' time.

## Annual Report of the Council for 1966

### World Power Conference, British National Committee.

Representative: G. L. R. Watkins.

At the Annual General Meeting of the British National Committee of the World Power Conference held on 27th May 1966, with Lord Hinton of Bankside in the Chair, it was noted that Nepal, Sierra Leone and Zambia have been admitted to membership of the International Executive Council at the meeting of that body in Haifa on 30th and 31st August 1965, bringing the total number of member countries of the World Power Conference to sixty-one. At the same meeting Monsieur Etienne (Switzerland) and Sir Edward Warren (Australia) were elected vice-chairmen. As a result of Sir Henry Jones being nominated as Official Delegate of Her Majesty's Government at the Tokyo sectional meeting, Lord Nelson of Stafford was invited to attend as Official Delegate of the British National Committee. It was confirmed at the International Executive Council meeting that the Seventh Plenary meeting of the World Power Conference would be held in Moscow in September 1968, the theme chosen being "World Energy Resources and their Utilization for the Welfare of Mankind". The draft technical programme as submitted is divided into six sections namely: Energy Resources and their Utilization; Energy Balance; Power Generation (including methods of producing electricity); The Transport of Energy; The Utilization of Energy and Secondary Energy Resources. A second issue of the World Power Conference Survey of Energy Resources is to be published on the occasion of the Moscow meeting.

In accordance with a resolution adopted in the previous year it was decided to set up an *ad hoc* committee to collect information on the present position of district heating and the following National Committees are represented on this committee: France, Germany, Roumania, Sweden, Switzerland, U.S.S.R. and U.S.A.

At the Tokyo Sectional meeting on 16th-21st October, attended by ninety-eight British participants, of which the main theme was "Problems of Future Years in Energy Utilization", sixteen papers were submitted for presentation by the British National Committee covering the three divisions of the technical programme: General Aspect; Future Problems in Conversion, Transportation and Storage of Energy; and Future Developments in Energy Consumption. It was noted that the Japanese National Committee had invited the British National Committee to designate two speakers to speak at each of the Round Table Conferences. The subjects were "The Problems of Peak Loads of Power" and "Public Nuisances Arising from Expansion of Power Plants", the respective speakers were Mr. N. Elliott and Mr. F. H. S. Brown.

It is recorded in the minutes that an *ad hoc* Review Committee under the chairmanship of Mr. E. Graftstrom of Sweden, had been set up composed of representatives from Australia, France, Great Britain, Japan, Nigeria, Poland, U.S.A. and U.S.S.R., to consider the re-organization of the World Power Conference. Various items in the questionnaire were discussed and replies agreed for submission to the Review Committee.

A report was submitted by the British Section of the International Commission on Large Dams (I.C.O.L.D.) covering the period between the 1965 and 1966 Annual General Meeting of the British National Committee. The Section which came into being early in 1966, has 216 members and I.C.O.L.D. 60 member countries. Regarding the question whether I.C.O.L.D. should separate from the World Power Conference a decision was not expected until the executive meeting at the Ninth Congress of I.C.O.L.D. to be held in Istanbul in September 1967. A copy of the Constitution of the British Section was also received by the British National Committee.

### BRITISH STANDARDS INSTITUTION COMMITTEES

#### C/37 Boiler Water Tests.

#### C/37/2 Methods of Sampling Water used in Steam Generation.

#### C/37/3 Treatment of Water for Marine Boilers. Representative:

D. Cochrane.

The panel on C/27/3/1 is dealing with B.S. 1170—Treatment of Water for Marine Boilers—first published in 1947, revised in 1957 and now under further revision.

The present Committee first met in November 1965 and up to the end of this year had met nine times. The Institute's representative attended the last two meetings on 28th September and 6th December 1966, which were largely composed of chemical engineers or chemists, drawn from representative bodies connected with shipping.

By the time the representative attended these meetings, the general framework of the method for revision had been agreed and most of the work was under way.

The Committee expects to have a rough draft of final recommendations available for circulation to industry, sometime in the early part of 1967.

The following points show the trend of the revision:

1) Instructions in the use of latest chemical treatments now used in marine practice, for example, hydrazine, amines and anti-foaming agents.

2) Recommendations for improved methods of testing particularly for phosphates, hardness, and sodium chlorides. It may be of interest to mention that the use of hydrometers is not referred to in the revision.

Treatment and testing recommendations are to be proposed under five separate types as follows:

Type 1 Low pressure boilers up to 250 lb/in<sup>2</sup>

Type 2 Medium pressure boilers 250-450 lb/in<sup>2</sup>

Type 3 High pressure boilers Group 1 450-600 lb/in<sup>2</sup>

Type 4 High pressure boilers Group 2 600-850 lb/in<sup>2</sup>

Type 5 High pressure boilers Group 3 850-1000 lb/in<sup>2</sup>

The Secretary of B.S.I. has drawn attention to the fact that wherever possible, metric units should be used and the Committee is bearing this in mind throughout all discussion.

At the meeting on 28th September a document on pre-commission chemical cleaning of marine boilers and feed systems was discussed and a small sub-committee appointed to revise the document prior to circulation to industry.

#### ELE/3/2 Ship's Cables. Representative: A. N. Savage.

No meetings have been held but the Committee has agreed to a Draft B.S.S. being circulated with a view to butyl rubber insulated cables being the future standard for marine cables.

#### ELE/3/30 Wiring Cables. Representative: A. N. Savage.

One meeting has been held to consider comments received regarding Draft B.S.S. for flexible cords insulated with glass fibre. Comments have also been received regarding 250/440 volt P.V.C. insulated and sheathed cables.

#### ELE/3/33 Insulation and Sheath. Representative: A. N. Savage.

Two meetings have been held during the year, the first to consider methods of test for P.V.C. insulation and sheath. The second, with comments received on Draft B.S.S. for B.S. 2899—Part 4: Heat-resisting, oil-resisting and flame-retardant sheath of electric cables.

#### ELE/28 Electrical Fans. Representative: J. G. Belsey.

A meeting of this Committee was held on 7th September but nothing of significance was recorded.

#### FSB/1 Definitions and Tests for Fire Resistance. Representative: A. S. Minton.

The work of this Committee involves revision and addition to the fire tests contained in B.S. 476, relating to building materials. Much progress has been made and general comment is now being invited on drafts of revised tests for Non-combustible, and Surface Spread of Flame. The new Fire Propagation Test is now in draft form for comment, also parts of a new glossary of terms pertaining to fire.

A new Ease of Ignition Test is now in draft form whereas the Fire Resistance Test is still being revised.

Progress as regards another new test, the Smoke Test, is slow, the subject being most complicated.

## Annual Report of the Council for 1966

*ISE/— Iron and Steel Industry.*

*ISE/15 Iron and Steel for Shipbuilding.*

*ISE/31 Wrought Steels.*

*ISE/31/1 Carbon Steels.*

*ISE/31/2 Alloy Steels.* Representative: T. A. Rush.

During the year the following new and revised British Standards have been published:

B.S. 1121—Part 1. Sulphur in iron and steel: Gravimetric.

Part 45: Phosphorus in iron and steel: Photometric.

Draft British Standards received.

B.S. 1121—Part 1: Sulphur in iron and steel:

Part 6: Nickel in iron, carbon steel and low alloy steel: Photometric.

Part 39: Nitrogen in steel: Volumetric.

Part 40: Tungsten in steel: Gravimetric.

Part 41: Lead in carbon and low alloy steel: Gravimetric.

Part 51: Magnesium in cast iron: Volumetric.

### *National Work*

The revision of B.S.S. 970 has continued with the steel industry having undertaken considerable work in preparing proposals for a new designation system covering carbon, alloy and stainless steels.

Proposals compiled by the National Billet Association in respect of carbon steels in this revision have also been received.

Work has continued in the revision of B.S.S. 1501 covering steels for pressure vessels and a number of draft material specifications has been circulated.

### *International Work*

A meeting of the group ISO/TCB/WG9 was held to discuss plate for shipbuilding and as a result the views of the steel industry are being sought in respect of tolerances for ships' plate.

A copy of ISO/R82 Methods of Mechanical Testing has been received.

*MEE/— Mechanical Engineering Industry Standards.* Representative: D. A. Eaton, B.Sc.

During the period under review the introduction of the metric system has to a considerable extent shaped the organization of the work and about 40 new or revised standards were approved for publication. The following are of interest to marine engineers:

#### *New Standards Published.*

B.S. 3889—Non-destructive testing of pipes and tubes.

Part 1A: Ultrasonic testing of pipes and tubes.

Part 2A: Eddy current testing of pipes and tubes.

Part 3A: Penetrant testing of pipes and tubes.

Part 4A: Magnetic particle flaw detection of pipes and tubes.

B.S. 3923—Methods of ultrasonic examination of welds.

Part 1: Manual examination of circumferential butt welds in pipes.

Part 2: Automatic examination of welded seams.

Part 3: Manual examination of nozzle welds.

B.S. 3928—Freight containers.

B.S. 3952—Cast iron butterfly valves for general purposes.

B.S. 978—Fine pitch gears.

Part 5: Hobs and cutters.

#### *Revised Standards Published.*

B.S. 132—Steam turbines.

B.S. 599—Methods of testing pumps.

B.S. 907—Dial gauges for linear measurements.

B.S. 3024—Side scuttles for ships.

B.S. 3464—Cast iron wedge and double disc gate valves for general purposes.

B.S. 3972—Yacht ropes.

*MEE/12 Chains and Fittings.* Representative: T. A. Rush.

A number of meetings of MEE/12 sub-committees has taken place during the year, for consideration of materials, design and inspection in respect of revision of national standards and also work in connexion with international standards.

The following draft specifications have been received:

Eye Bolts for Lifting Purposes.

Treble Swivel Assemblies for Ship Union Purchase.

*MEE/12/6 Anchor Chains.* Representative: T. A. Rush.

There is nothing to report in respect of this Committee, except that in the international field, a copy of the first Draft Proposal for ISO/R170 Anchor Chains, Stud Links, was received.

*MEE/17 Gears.* Representative: D. A. Stanger.

The gearing panel of this Committee has circulated Part 1 of the revision of B.S. 436: Spur and Helical Gears, which deals with the basic rack form, pitches and accuracy for the above gears.

This has been issued under document 66/1548 and supercedes a draft number D65/5538 which was given wide circulation to industry in order to invite comment. This later edition incorporates amendments agreed as a result of a study of the comments received.

Part 2 of B.S. 436 will incorporate the gear loading formula for which work has still to be completed and until this is finalized work on the revision of B.S. 545 for bevel gears has been held in abeyance until the problems have been resolved.

*MEE/21/3 Welded Air Receivers.* Representative: T. D. Shilston.

During the year this Committee met on five occasions to discuss various proposals made by interested parties and agreed amendments have been prepared.

*MEE/29 Pump Tests.* Representative: C. Winyard.

There has been little activity in connexion with the above Committee, except the receipt of a circular with the information that the Standard for "Methods of Testing Pumps" B.S. 599:1966 (price 30s.) has now been published.

*MEE/34/1 Cylindrical Boilers.* Representative: J. Liddell, B.Sc.

Several meetings of the Committee were held during the year to continue the work on the revision of B.S. 2790:1956 "Cylindrical Land Steam Boilers of Welded Construction (other than Water Tube Boilers)". Consideration of the Second Draft of the revised Standard has been completed and it is expected that the Third Draft, incorporating the various amendments which have been made will be issued to industry for technical comments in the near future.

Amendment No. 4 to B.S. 2790 was published in April 1966 as an interim measure since it was anticipated that the revision of the Standard would take some time to complete.

*MEE/34/2/1 Water Tube Boilers (Drafting).* Representatives:

L. J. Culver, B.Sc., J. P. Groome, N. Macleod, and J. N. Mackenzie.

A number of meetings has been held during the year and in August the Fifth Draft of the revision of B.S. 1113 was considered and approved in principle for circulation to industry for technical comments. Meetings were held on 28th and 29th November at which the comments from industry were reviewed and amendments made to the Draft.

It is intended that there will be another re-draft, after a further meeting to consider modifications has been held in January next year. The re-drafting will also probably incorporate a complete revision of the form of the Standard to bring it in line with recent standards on pressure vessels.

*MEE/34/6 Boiler Mountings and Fittings.* Representatives:

J. Liddell, B.Sc., and J. P. Groome.

The Committee has completed consideration of the final draft revision of B.S. 759:1955 "Valves, Gauges and Other

## Annual Report of the Council for 1966

Safety Fittings for Application to Land Boilers and to Piping Installations for and in Connexion with Boilers". Publication of the new edition of B.S. 759 is expected early in 1967.

*MEE/34/8 Pipes and Piping.* Representative: J. Liddell, B.Sc.

The drafting panel of this Committee has completed consideration of the final draft of B.S.806:1954 "Ferrous Pipes and Piping Installations for and in Connexion with Land Boilers". It is anticipated that the revised Standard will be published in due course.

*MEE/34/9 Boiler and Superheater Tubes.* Representative: J. Liddell, B.Sc.

The Committee met on one occasion to consider a revised draft of B.S. 3059: 1958 "Steel Boiler and Superheater Tubes". Modifications were made to the revision and it was agreed that certain amendments to the 1958 Specification should be published as an interim measure pending publication of the revised Standard.

*MEE/34/15 Corrugated Furnaces for Cylindrical Boilers.* Representative: J. Liddell, B.Sc.

The Committee met towards the end of the year to resume the revision of B.S. 1971:1953 "Corrugated Furnaces for Cylindrical Boilers". It is anticipated that a draft revision of the Standard will be completed and issued to industry for technical comment early in 1967.

*MEE/39 Compressors, Exhausters and Fans.*

*MEE/39/4 Fans for General Purposes.* Representative: J. G. Belsey, O.B.E.

During the year one meeting of Committee MEE/39 was held on 31st October, and two meetings of Committee MEE/39/4 were held on 12th January and 24th March. Nothing of any significance affecting the interests of the Institute transpired.

*MEE/39/3 Positive Displacement Compressors.* Representative: L. Sterling.

During the year the draft proposal for a B.S. for standard methods for testing positive displacement compressors and exhausters has been completed and completely revised, also discussed by the International Standards Organization. The alterations have not yet been submitted to the Committee, but will be considered early in 1967.

Agreement has yet to be reached on: Limits of accuracy of measurements; Manufacturing tolerance; and examination of the I.S.O. document, a draft proposal for technical conditions for the supply of displacement compressors. There are several points in this draft which appear to have merit for inclusion in the Standard and the draft has, therefore, to be considered paragraph by paragraph.

The finalization of the B.S. for Compressor Testing is still some way off, especially in view of the liaison with I.S.O. When completed, it will be a highly technical document on compressor testing and can be said to be too highly technical for standard duty compressors. It is important that as far as the Institute is concerned, the Committee should strive for the inclusion of type test compressors so that the charge for compressor testing does not become exorbitant.

Basically the marine compressor is, of course, always tested to the requirements of a society such as Lloyd's who will welcome instructions on type tests as an additional customer safeguard.

*MEE/81 Valves for Gas, Water and Steam.*

*MEE/81/3 General Purpose Valves.* Representative: J. G. Robinson.

One meeting of Committee MEE/81 was held during the year. A draft specification was prepared for "Standard Cast Iron Check Valves for General Purposes". Following final approval this was published as B.S. 4090 at the end of the year.

Work continues in preparation of a draft for "Flanged Steel Parallel Slide Valves for General Purposes".

One meeting of Committee MEE/81/3 was held. The draft specification prepared last year (a revision of B.S. 1552) for "Control Plug Cocks for Low Pressure Gases" has now been submitted for final approval and permission to publish.

Both Committees have for some time dealt primarily with small valves used in a wide variety of industries other than marine engineering.

During the year, following a recommendation of the Geddes Committee, B.S.R.A. carried out a pilot study on valve standardization.

After consultation with member firms, valve manufacturers and the large land users of valves, B.S.R.A. prepared draft standards covering the low-pressure valves of various types which constitute the majority of valves fitted on board ship. Further work on the standardization of other valves is planned.

Much of B.S.R.A.'s first draft embraced existing British Standards. It is to be hoped that as, and when, this work progresses, and the range of valves under consideration is further extended, useful B.S.I./B.S.R.A. interchanges are maintained and continued.

*MEE/88/2 Graphic Symbols for Fire Protection.* Representative: A. S. Minton.

The work of this Committee is being put into draft form and will be published as soon as is possible.

*MEE/131 Dished Ends for Tanks and Pressure Vessels.* Representative: T. D. Shilston.

During the year Committee MEE/131 met on four occasions to prepare a revision of B.S. 1966 and to discuss comments thereon subsequent to the issue of a draft to industry.

*MEE/158 Mechanical Vibration and Shock.* Representative: S. Archer, D.Sc.

Early in 1965 the terms of reference of Committee MEE/158 were extended to embrace the wider scope of subjects to be studied by ISO/TC. 108—Mechanical Vibration and Shock. The objective of this I.S.O. Committee is standardization in the field of mechanical vibration and shock and Working Groups have been set up as follows:

- WG 1 Terminology.
- WG 2 Measuring Instruments, their use and Calibration.
- WG 3 Acceptable Limits of Vibration and Shock.
- WG 4 Vibration and Shock Testing Equipment.
- WG 5 Vibration and Shock Isolators and Dampers.
- WG 6 Balancing, including Balancing Machines.
- WG 7 Thresholds of Mechanical Vibration and Shock Acceptable to Man.

To facilitate British participation in international standardization work, B.S.I. has now set up corresponding sub-committees to MEE/158 which have been meeting during the past two years with a view to producing British Standards in the relevant subjects generally in line with I.S.O. recommendations.

In April 1966 a meeting of ISO/TC.108 was held in Prague, attended by representatives of all the Working Groups with the exception of WG 6 which met in Copenhagen in August 1966 when considerable progress was made towards finalizing recommendations for international standards on glossary of balancing terms, balancing machines and balancing criteria.

*MEE/158/3 Mechanical Vibration and Shock.*

*MEE/158/6 Balancing, Including Balancing Machines.* Representative: J. McNaught.

The Standard for Mechanical Balancing on Marine Main Turbine Machinery, B.S. 3853:1966, has now been published. The main work at present is in the international field and the above Committees have been particularly active in the I.S.O. work.

The present stage of the work of the Committees is as follows: MEE/158/3—Consideration is at present being given to the I.S.O. draft proposal on evaluation standards for mechanical vibrations on machines. MEE/158/6—At the meeting in Denmark a draft proposal was agreed on balancing

## *Annual Report of the Council for 1966*

criteria and it is expected that this will be circulated to member countries for comment.

The I.S.O. draft proposal on Mechanical Balancing of Marine Main Turbine Machinery for Merchant Service is to be re-drafted by the United Kingdom.

Other work of this Committee which is progressing satisfactorily is terminology, balancing machines and communications format, symbols for the front panels of balancing machines, and field balancing.

*PTC/2 Fuel Oils.* Representative: R. Munton, B.Sc.

The revision to British Standard B.S. 2869:1957 "Oil

Fuels" has been circulated in draft form and comments on this draft are being considered for the final revision of the document.

*SHE/2 International Work on Shipbuilding.* Representative: G. C. Scott.

The above Committee met three times during 1966, on 14th April, 7th September and 30th November. Various proposals relating to shipbuilding details were considered.

*Reports have not been published for those committees on which the Institute is represented and of which no meetings were held during 1966.*



