maintaining a state of civilization. Viewed in this light they are seen to have a considerable degree of international status. Institutions of the same profession in different countries bear some resemblance to the local branches of a Universal Church, and the same is true of universities." There is, he suggested, a need for vigilance lest, in the modern State, the over-development of central administration should debase the true professional engineer into a mere specialist adviser to administrative boards.

Referring to the profession of electrical engineering, Prof. Moullin said: "A profession can be great without necessarily being learned. But we are essentially a learned profession, because the possibility of there being an electrical engineering profession depends, for its beginnings, on the highly intellectual and learned concepts of electricity. You cannot conceive of the Law as being anything but a learned profession because it depends, for its beginnings, on highly intellectual concepts. But there are other very great professions, possibly Medicine, where beginnings did not have to wait for the relevant purely intellectual concepts." The maintenance of standards of individual professional competence, he said, imposes upon the Institution an obligation to formulate a broad educational policy, although the Institution is not, in the conventional sense, an educational body. The essentially professional part of the electrical engineer's training is based on the industry, and "the distinction between those who have started at the university and those who have not done so" but have received their academic studies at a technical college, possibly on a part-time basis, "commonly becomes progressively more blurred as the years go on". The Council of the Institution does not favour a contemporary proposal to set up new technical colleges in which full-time undergraduate teaching in specialized branches of engineering would be carried on. "It is inevitable that engineers should be prominent in the affairs of man, in this era, and it is important to the welfare of contemporary civilization that those who are prominent should have had a broad education; this is obtainable in the university but is much less available in a monotechnic college. Recognizing the influence which engineers must have in the community, the Council are glad that a large number of those who enter our profession have been exposed to the good influences of a university during their student days." There is, in this connexion, a certain amount of misunderstanding in regard to the number of professional electrical engineers required by the industry of Great Britain. It is estimated that to meet the long-term demand an increase of only about ten per cent in the number of men qualifying annually is required. The present real shortage is in the number of trained technicians.

Prof. Moullin then referred to a recent decision of the Council of the Institution to foster and indeed to sponsor the setting up throughout Great Britain of a system of postgraduate courses of study in which leading exponents in the profession would make their specialized knowledge available to the general body of the engineering community. The physical framework of technical education in Britain is particularly favourable to this development, having, as we do, a large number of local educational centres in which such courses could be provided.

Prof. Moullin was somewhat sceptical as to the value of research training in the universities for young men who have just graduated, and he expressed a preference for the practice of bringing promising research men back into the university from industry at a later stage.

Examining in some detail the relation of the Institution to the profession, Prof. Moullin explained the practical significance of the charter and by-laws and discussed the constitution of the Council, the representation of the local centres and the constitution of the specialized Sections. "Because the Institution has existed for fewer years than our two great cousins, we are truthfully called the youngest of the three: but that statement can be misleading. It is only about 120 years since ideas and apparatus emerged to a point where Ohm's law could be recog nized, and only 108 years since Ohm was awarded the Copley Medal in commemoration of the discovery of his law, a discovery which brought technical application a whole range nearer. Without sensible error, we may call this the centenary of the birth of electrical engineering proper; and it is the 78th year of the Institution, which has therefore guided the development of the art for three-quarters of the time the art has existed." J. G.

THE JOHN INNES HORTICULTURAL INSTITUTION

ANNUAL REPORT

THE annual report of the John Innes Horticultural Institution always succeeds in giving a large volume of results in relatively small space. That for 1948 (from the Institution, Bayfordbury, Herts.; May 1949) is no exception. It will perhaps be remembered that the Institution recommended the raising of controlled hybrid raspberries, which would be free from virus diseases which are not seed-borne. D. Lewis and P. R. Day now review the results of five years of work on this question. They conclude that the hybrids are established more quickly than clonal stocks, yielding more in the first two years. Thereafter, virus infection takes place, when a virus-free clone of Norfolk Giant yields more than the hybrids. Seed of a new bush variety of tomato, named 'Puck', has been produced and released by M. B. Crane and A. G. Brown. It is early-maturing and heavy-cropping, but further breeding work is in progress. Genetic studies on pears have also been continued by M. B. Crane and D. Lewis; the present report includes a brief analysis of the inheritance of fruit and vegetative characters.

The Genetics Department, under K. Mather, was concerned mainly with the organisation, properties and analysis of the polygenic systems which control quantitative or continuous variation. It now seems clear that there can exist within a single species genetic differences sufficient, when selected, to produce diversity as great as that between different species. Various systems of genetic isolation have been studied; in *Petunia*, for example, the too-unlike pollen is disfavoured as well as the too-like. In *Antirrhinum*, genetic isolation of some species depends on the pollen-style relation; but between *A. majus* and *A. glutinosum* it depends on insect behaviour. A. J. Bateman, studying the French bean, has also found somewhat comparable behaviour. This plant is normally inbred; but some varieties show a small percentage of out-crosses.

The director of the Institution, Dr. C. D. Darlington, reports work from the Cytology Department on differentiation in the pollen grain and the occurrence

of iso-chromosomes. An interesting explanation of unequal distribution of cytoplasm when the generative nucleus is formed lies in the eccentric position of the primary nucleus before division. At mitosis, one of the daughter nuclei is therefore nearer the cell wall than the other, a difference in position which is accentuated by the infiltration of ribose nucleic acid into the zone between the two nuclei. Harlan Lewis, a visitor from the United States, shows some interesting similarity in range of chromosome numbers between *Clarkia* and *Godetia*. Cytology of *Narcissus* varieties is reported by Miss A. P. Wylie. The ancestral species *N. pseudonarcissus* and *N. poeticus* are diploid ($2n = 14$). Triploid varieties, raised about 1860, include Emperor, Empress and Sir Watkin. The variety King Alfred was one of the first tetraploids.

In the Garden Department, W. J. C. Lawrence again demonstrates the beneficial effects of twenty days of artificial illumination of tomato seedlings, showing increases of subsequent fruit yield, particularly in the early pickings, and average 10–16 per cent increase over the whole fruiting season. Other investigations include the use of 'standardized' loam, the best methods of raising particular plants, and the use of soil blocks instead of pots for growing plants.

A review of such a concentrated annual report must of necessity be somewhat invidious. There is a good deal of information for the teacher, the advisor and the research worker; such persons must, however, be referred to the report itself, or to the numerous specialist papers cited therein.

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INTERNATIONAL CONFERENCE ON SCIENCE ABSTRACTING

AN International Conference on Science Abstracting, arranged by the United Nations Educational, Scientific and Cultural Organisation, was held during June 20–25, 1949, at Paris, and the Final Act has now been made available (Paris: Unesco House, 19 rue Kléber).

The Final Act was inspired by the conviction of the important place of abstracting and indexing services in scientific communication and of the inadequacies of the present overall arrangements. The Conference regarded the objectives of abstracting in science as complete coverage by abstracts of all papers containing new information, and adequate access to abstracts for all men of science in all countries. To this end, in the Final Act a number of specific recommendations are detailed. These include, besides the continuance of Unesco's efforts to promote the free interchange of scientific literature among different countries, the extension of abstracting and indexing services to cover such fields as agriculture and applied biology, which are not at present covered. Abstracting services are also recommended to provide separate sections for information on new scientific and technical apparatus and equipment, where this is not already done. Publication of abstracts, particularly agricultural abstracts, in additional languages is also urged, and abstracting agencies are recommended to co-operate by extending agreements for the exchange of abstracts and of original material for abstracting, and by defining their respective subject fields. The Conference noted that the Abstracting Services Consultative Committee, serving the interests of the United Kingdom and of the British Commonwealth and embracing the whole field of science, had recently been established in London, and that the Unesco Co-ordinating Committee on the Abstracting and Indexing of Medical and Biological Sciences had been constituted on a permanent basis. The Conference recommended similar action in other regions and for other subjects, suggesting that regional or national committees on a voluntary basis should be formed to ensure that scientific publications in their own region are adequately listed and abstracted, and that scientific workers in their region are supplied with abstracts of papers published in foreign countries.

The formation of subject committees at an international level to co-ordinate abstracting in the major fields of pure and applied science is also suggested; and in particular it is recommended that Unesco should invite the appropriate bodies to co-operate in establishing subject committees of users and publishers of abstracts of physics and engineering, pure and applied chemistry, agriculture and applied biology, and should offer these committees facilities similar to those already provided for the Co-ordinating Committee on the Abstracting and Indexing of Medical and Biological Sciences. The Conference also endorsed a proposal for the publication under international auspices of a general abstracting periodical for physics, pure and applied, including astrophysics and the geophysical sciences, and possibly branches of engineering, and recommended the formation of a committee for this purpose. Other recommendations were in line with those of the Royal Society's Scientific Information Conference last year and relate to such details as the provision of synopses (the "Guide for the Preparation of Synopses" issued by the Royal Society being suggested as a basis for discussion), titles and the presentation of abstracts, lists of periodicals abstracted and of references and tables of contents, as well as to terminology and nomenclature. Publication, at least every five years, of a directory of indexing and abstracting services is recommended, as well as the establishment of regional bibliographical centres and depositories for published and unpublished works. Finally, the Conference urged support of the development of a standardized classification, and also the need for detailed evaluation of the various systems proposed for chemical notation, in view of their value for recording chemical data and possible application in indexing; and also the convening of a small conference of experts to lay the foundation for an international code for use with mechanical or electrical devices for selecting documents.

To the general importance of most of these matters most scientific workers would subscribe, and in Great Britain a committee has already been set up, under the chairmanship of Dr. C. W. M. Findlay, to consider problems of abstracting in the light of the discussions at the Royal Society's Scientific Information Conference last year. The "Guide for the Preparation of Synopses" was prepared by this Abstracting Services Consultative Committee. Not all these matters mentioned, however, are of the same urgency or importance, and financial considerations may well dictate that in the first instance attention be concentrated on only a few of them. The Unesco Abstracting Conference itself recognized that the provision of financial means would require special consideration, and suggested that on this point also Unesco should consult the World Health Organisation and the Food and Agriculture Organisation.