

Although the technical colleges have their place in the structural scheme of Indian education and have, in fact, included courses in textile technology in their curricula, the emphasis in India has in the past been placed almost entirely on cotton, to the exclusion of jute. The reason for this discrimination appears to have arisen from the traditional attitude of the jute mills, for the most part financed and managed by the British, towards the recruitment of men to fill the more responsible supervisory posts; until fairly recently the tendency was to import British-trained men, and there was consequently less demand by Indians for training in jute than in cotton technology. This attitude has had to be revised, however, because of the altered political and economic circumstances, and the industry is faced with the problem of finding suitably trained men for entry into the mills as supervisors.

The foundation of the Institute of Jute Technology in Calcutta is an attempt to solve this problem by providing a course of instruction, spread over three years, for 100-150 student-apprentices. To qualify for entry, candidates must have passed the equivalent of the intermediate science examination, to have reached, that is, the minimum standard for entry on a university degree course. The subjects studied at the Institute include the basic sciences—mathematics (including elementary statistics), physics, and chemistry—the production and characteristics of the vegetable fibres generally, the spinning and weaving of jute, analysis and testing, engineering and machine drawing, and business organization and administration. Besides this, about half the duration of the course will be spent in mills acquiring practical experience of the industry. Entrance is restricted to nominees of the mills, which pay the tuition fees and make a subsistence allowance to their nominees.

At present the full-time staff consists of the principal, three senior lecturers (engineering, physics and testing, and spinning and weaving) and a lecturer in textile chemistry; part-time lecturers deal with jute production and business organization, etc. The principal, C. R. Nodder, was formerly chief chemist to the Linen Industry Research Association in Belfast, and later director of the Technological Research Laboratories of the Indian Central Jute Committee.

The Institute was formally opened early in March by Dr. B. C. Roy, Chief Minister, West Bengal. The buildings, which were started in 1948, consist of two blocks: one, intended to house technological equipment, is not yet completed; the other, containing administrative offices, an assembly hall, common room, refectory, lecture rooms, laboratories and library, is already in use by the first batch of students. The buildings stand on about 1½ acres of land. The estimated capital outlay, Rs. 2,000,000, and the provision of an annual running expenditure of Rs. 200,000, have been made by the Indian Jute Mills Association. The Institute is to be affiliated to the University of Calcutta and is to be administered jointly by the University and the Indian Jute Mills Association; the University has not, however, been called upon to shoulder any financial burden, although, in fact, the assets of the Institute are to be vested in it by a deed of trust.

From the point of view of the Institute, affiliation to the University, if it implies opportunities for students to share in non-academic activities (it is not clear at present whether this is, in fact, the intention), is an obvious advantage, as it would afford a possible counterpoise to the bias imposed

by the restriction of the declared activities of the Institute to teaching. If it is the intention that students may ultimately graduate from supervisors to managers, some contact with active research is probably desirable. One obvious development along these lines suggests itself: the Indian Jute Mills Association already has a Research Institute in Calcutta, with a scientific staff in contact with both fundamental and processing research, and some sort of collaboration between the two Institutes, perhaps by means of colloquia in which selected current research topics could be discussed, could do much to help train the students as possible liaison men between the new Institute and their mills.

## FIFTY YEARS OF SYSTEMATIC SEROLOGY

### NUTTALL MEMORIAL CELEBRATION

THIS year may be said to mark the end of the first half-century of systematic serology, for it was in 1901 that the late Prof. G. H. F. Nuttall, emeritus professor of biology in the University of Cambridge, published the first reports describing the results of the testing of precipitin antisera with a variety of antigens of animal origin, and thereby started the science of comparative or systematic serology. In recognition of this anniversary, a Nuttall memorial celebration was held on March 19 at the Serological Museum of Rutgers University; during the afternoon there was an exhibition of the work of the Museum and of its Nuttall historical materials, and a tea for serologists and friends of the Museum. The materials exhibited included some of Nuttall's original fluid sera, four of his charts, and two sets of protocols relating to the researches in blood relationship, all of which had previously been in the care of Prof. D. Keilin, director of the Molteno Institute in the University of Cambridge, and were given to Dr. Alan Boyden, director of the Serological Museum, during the latter's visits to Cambridge last August.

The celebration was concluded with a symposium in the evening, sponsored by the Rutgers Chapter of Sigma Xi, entitled "A Half-Century of Systematic Serology; the Work of Nuttall and his Associates at Cambridge and of his Successors in America". Those participating were: Dr. T. C. Nelson, who gave an account of Nuttall based on his visits to Nuttall's laboratory and home in 1931; Dr. P. A. Moody, who reported on researches in systematic serology carried on in the University of Vermont under his direction; and Dr. Alan Boyden, who briefly summarized the more important old and new work in the field and gave an appraisal of the significance of Nuttall's contribution to it.

Dr. Boyden pointed out that Nuttall himself was aware of some of the limitations of his techniques. In 1902, after completing a series of quantitative tests in which he measured the volumes of settled precipitates, Nuttall said: "I do not wish these numbers to be taken as final, nevertheless they show the essential correctness of the previous crude results. To obtain a constant it will be necessary to make repeated tests with the bloods of each species and with different antisera of one kind, making the tests with different proportions of antiserum. I am inclined to believe that with care we shall perhaps be able to measure species by this method, for

it appears from the above results that there are measurable differences in the reactions obtained with related bloods, in other words, determinable degrees of blood relationship which we may be able to formulate." These words, continued Dr. Boyden, were prophetic in that they pointed the way to future progress, and especially to the developments of the past decade.

Dr. Boyden then went on to describe briefly Nuttall's contributions to systematic serology. Besides being the first to have the insight to appreciate the potential significance of systematic serology and the enthusiasm to undertake an extensive study of its problems, Nuttall inspired a small band of workers, Dinkelspiel, Graham-Smith, Strangeways and Sanger, to join him in his studies of blood relationships, and they worked effectively together in building the foundation for the future. He and his associates demonstrated a general parallelism between the systematic positions of animals, where they seemed to be relatively certain, and the precipitin tests of their sera. In fact, among the quantitative tests, only about ten per cent are obvious errors in view of modern knowledge in regard to the relationships of the species tested. Finally, Nuttall and his co-workers provided evidence bearing upon the systematic positions of species or groups of doubtful relationship. Thus it was found that: an anti-limulus serum reacted more strongly with arachnid sera than with decapod sera; the sera of whales were more similar to the sera of even-toed ungulates than to those of any other orders of mammals tested (this has recently been confirmed); and the serum and egg proteins of birds show some evidence of similarity to those of chelonians and crocodiles.

A fuller account of the celebration, including the reports of the principal speakers, together with other matters of significance relating to the half-century of developments in systematic serology, has been published in the May issue of the *Bulletin of the Serological Museum*. Copies will be available upon request from the Director, Serological Museum, Rutgers University, New Brunswick, N.J.

## PHYSICAL SOCIETY ANNUAL GENERAL MEETING

AT the annual general meeting of the Physical Society, held at the Royal Institution on May 2, the reports of the Council and honorary treasurer and the accounts and balance sheet for 1950 were presented and adopted, and the officers for 1951-52 were elected as follows: *President*, Prof. L. F. Bates; *Vice-Presidents who have filled the office of president*, Dr. C. H. Lees, Sir Frank Smith, Sir Owen Richardson, Dr. W. H. Eccles, Prof. A. O. Rankine, T. Smith, Prof. Allan Ferguson, Sir Charles Darwin, Prof. E. N. da C. Andrade, Sir David Brunt, Prof. G. I. Finch, Prof. S. Chapman; *Vice-Presidents*, C. H. Collie, Prof. R. E. Peierls, Dr. D. Roaf, Dr. A. C. G. Menzies; *Honorary Secretaries*, C. G. Wynne, Dr. H. H. Hopkins; *Honorary Foreign Secretary*, Prof. E. N. da C. Andrade; *Honorary Treasurer*, A. J. Philpot; *Honorary Librarian*, Dr. R. W. B. Pearse. The chairmen for 1950-51 of the four Groups of the Society are as follows: *Colour Group*, Dr. W. S. Stiles; *Optical Group*, Dr. A. C. G. Menzies; *Low Temperature Group*, Prof. F. E. Simon; *Acoustics Group*, H. L. Kirke.

During 1950 the membership of the Society rose to 1,936, with a net increase of forty. However, the figures given in the report show that since 1947 there has been a steady decline in the number of newly elected Fellows, together with a considerable number of resignations. The accounts show a favourable balance of income over expenditure of just over £2,000. The treasurer, nevertheless, points out that there are two sources of uneasiness in respect of the health of the Society's finances. The first is the dependence of the whole financial structure of the Society on the success of the annual exhibition of scientific instruments and apparatus. The balance of £2,000 mentioned previously was mainly due to the very large balance of receipts over expenditure, approximately £3,800, for the 1950 exhibition. The second source of uneasiness is the very heavy cost to the Society of the provision to its members of *Science Abstracts*.

In accordance with a recommendation of the papers committee, the science meetings of the Society have recently taken the form of general lectures or symposia in place of the presentation of papers on unconnected subjects. The marked increase in attendance at these meetings would appear to justify the new policy. Nine science meetings were held in London. A one-day meeting was held at the Billingham Division of the Imperial Chemical Industries, Ltd., and two-day meetings were arranged at the University of Liverpool in the summer and at the Cavendish Laboratory, Cambridge, in the winter. The thirty-fourth Guthrie Lecture was delivered by Prof. G. I. Finch, who spoke on the sliding surface, and the fifth Rutherford Lecture by Dr. A. S. Russell. P. Jacquinet, of the University of Paris, was the recipient of the fifth Holweck Medal of the Société Française de Physique and the Holweck Prize; the subject of his discourse was "Quelques recherches sur les raies faibles dans les spectres optiques", the text of which appears in the Society's *Proceedings*, B, 63, 969 (December 1950). The twenty-seventh Duddell Medal was presented to Dr. D. W. Fry, who described his work on linear accelerators, and the sixth Charles Vernon Boys Prize to Dr. G. P. S. Oechialini, who spoke on physical problems in cosmic ray research.

The Society continues to be represented on various joint committees and bodies, details of which are listed in the annual report, together with details of the activities of the four Groups. It is of particular interest to note that twenty members of the Low Temperature Group visited France in April as the guests of L'Air Liquide to inspect low-temperature research and industry in that country, and that at the International Acoustical Meeting held in Marseilles in May it was agreed to establish *Acustica*, a European journal of acoustics, with Dr. E. G. Richardson (King's College, Newcastle) as the British editor.

The report omits mention of the various publications of the Society, though these are an essential and important item of the activities. Mention is made, however, of the fact that owing to the continued rise in the cost of publishing and the steady increase in the number of papers submitted for publication in the Society's *Proceedings*, the Council has considered possible changes in the organization of publication and the basis of membership. No specific recommendations have as yet been made; but it is stated that these will shortly be submitted for the consideration of members.