

(38 acres), which is a biological preserve of the University, and the lake in Madingley Park are also available for certain research projects. There are 60 small and 12 large aviaries and a large number of indoor bird-rooms and flights, as well as two sound-proof rooms especially constructed for the isolation of experimental birds from those frequencies which constitute the essential basis of bird songs and call notes. An admirable building (Fig. 1), designed by Mr. Peter Bicknell, of Messrs. Hughes and Bicknell, Cambridge, has now been erected and the Sub-department occupied it in August 1962. The new building is divided into approximately twelve individual research rooms, dark room, histology room, office, accommodation for full equipment of sound-proof cages, garage, workshop, etc. There are also three large rooms, one of which is at present being used as an isolation room for primates and birds, while the others accommodate small mammals and fish. The roofs are pitched, and the whole of the roof space is utilized. In one block the two roof slopes are split at the ridge to give a continuous clerestory, lighting small workrooms. In the other block there is a continuous loft 80 ft. x 30 ft. uninterrupted by roof timbers, which can be used for experiments requiring a long indoor runway or large choice chambers. There is also a house for the senior assistant in charge.

It is intended that the first main line of investigation of workers in the Sub-department should continue to be the instinct/learning problem, particularly as exemplified in the study of sensitive periods in learning. Such a heading includes several lines of work which the experience of the past few years has shown to be the most promising. With birds it would include studies on the ontogeny of new motor actions, and the continuance of studies on song-learning and vocal imitation and their sensory and motor control. Studies on the ontogeny of species-characteristic behaviour, particularly work such as that on the analysis of the role of experience in nest-building, will be continued. Studies on mammals will, as hitherto, centre round the mother-offspring relation, and the work with the now well-established colony of

rhesus monkeys is proceeding. The second main field of investigation can broadly be described as 'motivation'. This, of course, interdigitates with the first—for example in the analysis of song patterns, endocrinology (particularly of nest-building) and studies of changes in responsiveness to a constant stimulus.

The third main aspect of the work can broadly be called physiology. Studies on the hormonal control of the cycle of reproductive behaviour, especially of nest-building in canaries, has already been mentioned, but a new development is the initiation of neurophysiological investigations. While much is known about the neurophysiological changes concerned with learning in mammals, the neurophysiological understanding of the essential mechanisms involved in what are generally known as 'instinctive actions' is, by comparison, meagre in the extreme. When we come to birds, in which these instinctive actions are far more obvious and highly developed than they are in the mammals, neurophysiological information is almost non-existent. The application of new techniques of central stimulation seem to offer great promise in this field.

In the past, workers in the Sub-department have been fortunate in being able to maintain close contact with colleagues in related fields. Thus we have had close co-operation with members of the Department of Experimental Psychology, under Prof. O. Zangwill, and especially with the workers on primates there—Dr. L. Weiskrantz and his associates. Also within the University, contact has been maintained with the Department of Physiology (Sir Bryan Matthews), and we look forward to future collaboration with the new Department of the Physiology of Reproduction under Prof. A. S. Parkes. Outside Cambridge, we have worked closely with Dr. John Bowlby of the Tavistock Clinic, who is investigating mother/infant interaction in man. We hope that such co-operation will be increased and extended as a result of the new developments because we believe that ethology has a special part to play in the establishment of mutually profitable relations between the various behavioural sciences.

W. H. THORPE

PROBLEMS OF COMMUNICATING SCIENTIFIC IDEAS

*A TENTATIVE Study of the Publication of Original Scientific Literature**, issued by the Abstracting Board of the International Council of Scientific Unions, like the study of *The Foreign Language Barrier in Science and Technology* †, recently published by Aslib, is concerned with the availability of original publications in foreign languages. Both are based on fresh surveys, but, except in respect of courses in Russian for scientists, neither adds substantially to the findings of the report, *Scientific and Technical Translating and other Aspects of the Language Problem*, issued in 1957 by the United Nations Educational, Scientific and Cultural Organization

* Conseil International des Unions Scientifiques, Paris. Bureau des Resumes Analytiques. *A Tentative Study of the Publication of Original Scientific Literature*. Pp. 11+16 tables. (Paris: Conseil International des Unions Scientifiques, 292 rue Saint-Martin, 1962.)

† *The Foreign Language Barrier in Science and Technology*. (A study based upon three investigations carried out in the Research Department by Moira Phillips.) Pp. vi+57. (London: Aslib, 1962.) 12s.

(see *Nature*, 180, 1170; 1957). However, the Aslib report refers to this earlier and much more comprehensive report. The report from the International Council of Scientific Unions is based on a questionnaire sent early in 1960 to 260 selected periodicals, mainly in Europe, but 86 did not reply. The survey did not pretend to give a representative sampling of original publications, but in view of the fact that a sampling of 1,000 periodicals for the Unesco survey indicated that some 61.5 per cent of the papers were in English and only 17.4 per cent in French and 2.2 per cent in German, the selection of 72 French periodicals and 33 German compared with 39 British and 63 United States seems to rob the findings of some substance. Russian periodicals, which in the Unesco survey accounted for some 10 per cent, were not included, though this language was in 1957 competing for the second place, and Japanese was then challenging French for fifth.

This survey, however, was not primarily concerned with language: it was equally concerned with the selection of papers for publication and with financial aspects, on which later, however, the only firm conclusion drawn was that no law of political economy appears to have any validity in this field of publication. Only in Canada did some effort appear to have been made to organize scientific publication financially and there is a very wide variation in the price demanded of the scientific subscriber for 10,000 words of scientific literature. Sometimes a single periodical has widely different subscription rates for different categories of subscribers; even within one country and one scientific discipline, rates may vary widely with no apparent explanation. The mean value for commercial publishing seems to be higher everywhere than the mean value for periodicals owned by non-profit concerns or societies, though a few exceptions can be found.

Submission of papers to a referee was practised by 71 per cent of the periodicals, but was not universal, especially outside the United States; 72 per cent of the periodicals publish authors' abstracts, but only 40 per cent decline to publish a paper unaccompanied by an abstract written by its author. Only 38 per cent of the periodicals appeared to be aware of the *Guide for the Preparation of Synopses*, in spite of the efforts made since 1949 by Unesco and the Abstracting Board of the International Council of Scientific Unions to distribute this and make it known; only a minority (6 per cent) of editors have taken steps to make it known to the authors of papers, while only a very few have framed and distributed their own rules.

The Aslib report is based on three studies carried out by Miss Moira Phillips, of the Aslib Research Department, but the introduction, while rightly stressing that in the immediate future an increasing proportion of the world's scientific literature will be in Russian, Chinese and Japanese, in urging the importance of a knowledge of these languages, and of cover-to-cover translations, appears to underestimate both the outstanding importance of English itself as a medium of communication and of the economic and other considerations which will tend to encourage publication in one or other of these four major media as against nationalistic considerations. The first of the three studies sought to establish how many hours of tuition were necessary to enable a scientist to acquire sufficient knowledge of Russian

grammar, construction and vocabulary to understand Russian papers at least on his own subject. The second was a study of cover-to-cover translations with the view of seeing to what extent it would be feasible to meet the demand for translations by cover-to-cover publications. In this, Dr. D. J. Urquhart comments that the number of *ad hoc* translations made before a cover-to-cover translation is no measure of the use of the cover-to-cover translation, which is a disseminating medium in its own right. The third study was of the participation and co-operation in the *Commonwealth Index of Unpublished Scientific and Technical Translations*.

Summarizing the three studies, Mr. C. W. Hanson concludes that language barriers separate English-speaking scientists and engineers from about one-third of the world's scientific and technical literature, to which learning to read foreign languages, and especially Russian, at present offers the most direct approach. A reading knowledge of Russian sufficient to enable a scientist to make sense of a paper on his own subject can be acquired with about 50-200 hours of tuition, and it would be feasible to provide sufficient courses in the United Kingdom for about one-quarter of the annual output of graduate scientists and engineers. While the demand for cover-to-cover translations of individual articles is concentrated on a few periodicals, the production of some additional cover-to-cover versions would be justified as providing ready-made translations of individual articles which may be needed. Generally, the demand for translations of individual articles is too thinly scattered over a large number of periodicals to justify a massive programme solely as a means of meeting demand. The need for translations to meet individual wants will continue, and co-operative indexes and pools provide a means of avoiding duplication of effort. The *Commonwealth Index of Unpublished Scientific and Technical Translations* operates at a profit to the community even when judged on the criterion of avoidance of duplication alone and has scope for growth. A study of the literature supports the view that the progress already made and the magnitude of the rewards of success justify major efforts in machine translation, although comprehensive machine-translation services comparable in adequacy and cost with those provided by human translators are unlikely to be achieved in less than a decade.

DANGERS OF DRINKING SEA WATER

THE salt content of body fluids is about 1 per cent. In the open ocean the salt content of the sea is about 3.5 per cent. In health, when food and water consumption is adequate, the salt concentration in the body is kept relatively constant by the kidneys; it varies, but only within a small range. In a healthy individual suffering from deprivation of water the concentration of salt in the urine does not average more than 2 per cent. This difference in salt content between the body fluids and sea water, and the physiological inability of the kidney to excrete more than a certain proportion of salt in the urine, form the basis of the generally accepted view that drinking sea water does harm. It introduces a hypertonic solution into the circulation, water is withdrawn

from the tissues to restore the osmotic balance between the tissues and vascular system, the blood volume is increased, and the kidney is called on to excrete the excess fluid. The net result is progressive dehydration of the tissues, leading to disturbances in the acid-base balance, a rise in the non-protein nitrogen of the blood and the plasma protein concentration, a reduced cardiac output, thirst, and, in due course exhaustion, collapse and death.

This view was challenged by Dr. Alain Bombard who crossed the Atlantic Ocean in 1952 on an inflatable raft, taking more than two months for the voyage and relying chiefly on sea water and fluids expressed from fish to quench his thirst. The opinion he reached after these trials on himself was that people