13,823 men and women, made up of 3,230 monthly paid staff, 3,950 secretarial and clerical staff and 3,643 manual staff. They belong to some fifty nationalities and more than a hundred professions which, with the wide geographical spread, create peculiar problems. The executive management is carried out by a board which consists of the director-general and six other directors. The directors of Sound Broadcasting, Television and External Services have purely functional duties, that is, they are responsible for a field of output and for the staff directly concerned with that output. The director of administration and the director of technical services have responsibilities which permeate the whole Corporation, though each has a considerable direct area of responsibility in addition. The sixth director is the chief staff officer to the director-general on policy matters.

The Corporation has no criterion of profit by which to test the success of the methods employed by its various parts, and it must therefore endeavour to regulate administration by giving to directorates the guidance emanating from specialist departments that are centrally established. One of these is the Central Establishment Office, which continuously investigates, in close co-operation with the heads of the departments concerned, staffing, organization and methods. Between two and three hundred technical assistants are recruited for the engineering staff each year, while for the programme and administrative staff a small number of young men and women are recruited straight from school or from university, though the majority enter at a later stage. The main need with regard to staff is for people who have attained a certain degree of experience and skill in the world and who enter the Corporation in response to public advertisement.

In such a diverse and dispersed body as the Corporation, a system is necessary which enables people to move easily from one compartment to another, for otherwise promotions would tend to remain within departments and a general rigidity would ensue. This problem is solved by a promotion system affecting the whole organization, a flexible grading system, and a scheme of bonuses for outstanding work and creative skill. Such a large organization gives rise to considerable problems of communication, but these are minimized by regular meetings up and down the chain of command and staff representation. Considerable staffing difficulties have been caused by the formation of the Independent Television Authority, and drastic measures have been used to deal with them. With the ending of the Corporation's solitary position in the country, broadcasting, and television in particular, are now moving into a new phase in Great Britain.

The development of research into the human factor in industry was outlined by Mr. A. B. Waring, chairman of Joseph Lucas (Industries), Ltd. This had, in 1953, led to the setting up of the Joint Committee on Human Relations in Industry, with himself as chairman, to advise the Department of Scientific and Industrial Research and the Medical Research Council on research in this field. The majority of the projects it has accepted fall under four broad headings: incentive schemes with reference to the social factors associated with them; technological change with reference to the human implications involved; management organization with reference to staff supervision and functional specialists; promotion and training. There are also special projects such as relations between office staffs and factory workers and the effects of ageing on adaptability to work.

It is possible, he said, to approach the subject of human relations in industry from a basic theory that any community left to its own devices will establish for itself in the course of time a *modus vivendi* which will satisfy the majority of its members so that the pattern of relationships among them and their general contentment will remain more-or-less constant. But when violent changes are imposed by wars, the impact of other civilizations or the upheavals due to the changes that industrialization brings about, the pattern of society becomes distorted and discord ensues. Changes in the pattern of work and employment brought about by changes in the circumstances of trade and by ever-increasing mechanization can result in disturbances ranging from suppressed resentment to open resistance. Man, being a reasoning animal, is prepared to accept change when it is properly presented and when he is satisfied that he will benefit or that his future depends on it.

The best human relations will exist in those factories in which leadership qualities are high and well founded and are regarded as being no less important than technical and administrative ability, and where both leaders and led work in circumstances that maintain continuously both their status and their morale. Mr. Waring suggested that before any project of research into human relations in industry is undertaken, it should first pass the test of whether or not it falls into the category of a deeply rooted problem of general significance; if not, and if it can be classified as a problem resulting from inadequate local management, it is unlikely to be a subject for basic research and may well be dealt with through management training and reorganization or through investigation by industrial consultants. But where, in a branch of industry, there is a general malaise evidenced by labour unrest with no apparent sensible justification, or where in specific instances the support of workpeople is withheld or there is either open or suppressed resistance the reasons for which are obscure, research is the obvious and perhaps most valuable method of approach.

Mr. Waring stressed the importance of choosing subjects for research in human relations most carefully; otherwise there is the danger of regarding such research as a type of industrial patent medicine. It is equally important that its practitioners should be worthy of their tasks. T. H. Hawkins

OBITUARIES

Sir Malcolm Watson

Sir Malcolm Watson, director during 1933–42 of the Ross Institute of Tropical Hygiene (London School of Hygiene and Tropical Medicine), died on December 28 at the age of eighty-two.

The successive steps which led to modern conceptions of the epidemiology of malaria were: (1) Manson's hypothesis that mosquitoes transmit the disease; (2) Ross's confirmation that mosquitoes do transmit, and his own, most important, contribution showing that not all of them do so—not the grey mosquito, not the brindled mosquito, only the dapple-winged one; (3) Grassi's entomological addition that the mosquitoes which transmit malaria

all belong to the genus *Anopheles*; and, finally, (4) Stephens and Christophers', and James's, fundamental rules: (*a*) some species only of the genus *Anopheles* are of practical importance in malaria transmission, and (*b*) each of them has its own preferential breeding places.

Malaria control, as an activity directed against mosquitoes, had taken no account of these rules, which I have called fundamental because they became, in Watson's hands, the basis of antilarval measures. Anti-mosquito work, in the early days, consisted of measures directed against the breeding places of mosquitoes, irrespective of their genus or species. As often as not more larvæ were killed belonging to the genera *Culex* or *Aedes* than to *Anopheles*. The waste of effort was compensated, to some extent, by the fact that the earlier successful campaigns were directed against urban malaria (Ismailia, Havana, Port Swettenham), with the advantage of the population to be protected living within a comparatively small area.

That was Watson's experience in Malaya. He had successfully dealt with the malaria epidemic in Port Swettenham, the newly opened maritime port of the rubber-growing districts, which threatened to become useless because of malaria. Watson saved it from being closed again; but he was at a loss how to act when he was requested to apply his method to the rural areas where rubber was grown, and where the labourers employed on the estates were seriously affected by endemic malaria. It was clearly impossible to remove, or to oil, all breeding places of mosquitoes in a large rural area, as had been done in a small urban area: the expense would have been prohibitive.

At this juncture Watson remembered the Stephens–Christophers–James rules, and the way they had been established. He applied his predecessors' method of research, which has become the pattern of the so-called malaria survey: the preliminary stage of every anti-malaria campaign. This survey includes two main sections. The first consists of three parts: (1) determining the distribution of malaria in the district; (2) collecting adult anopheles and identifying them, so as to be able to compile a list of the anopheline species of the district, and to establish the distribution of each one of these species; (3) comparing the data afforded by (1) and (2), in order to find out whether or not a correlation can be established between the distribution of malaria and of one of the local anopheline species. If such a correlation exists, the species involved is suspect of being the local vector of malaria. The second section of the survey consists of two parts: (1) determining the natural rate of infection with malaria parasites of each one of the local anopheles, in order to check the results obtained in the first section; (2) identifying the principal breeding places of each anopheline species. When the principal local vector has been identified in this way, and it has been proved, moreover, that this species has more or less specialized breeding habits, which induce it to select a certain type of breeding place in preference to all others, it becomes possible successfully to suppress the breeding of that one species, by dealing with its preferential breeding places, while leaving undisturbed all other collections of water, and the larvæ of the species breeding therein. This method of selective larval control, which since then has been called 'species sanitation', was first elaborated by Watson on the rubber estates in the flat swampy land of the coastal area of western Malaya, where *Anopheles umbrosus* was proved to be the main vector, and next in the hilly country, where *Anopheles maculatus* takes over this function. It proved much less expensive than the indiscriminate larval control applied in cities, and so it rendered possible "rural sanitation in the tropics", the highly appropriate title selected by Watson for his first book.

Watson's method of species sanitation has conferred untold benefits on many countries to which it was applied, notably on the former Dutch East Indies (now Indonesia). So it is not inappropriate that the editors of *Nature* should have invited a Dutchman to pay posthumous homage to this benefactor of humanity.

N. H. Swellengrebel

Dr. V. E. Nash-Williams

Dr. V. E. Nash-Williams died suddenly at the age of fifty-eight on December 15. He had been keeper of archæology in the National Museum of Wales and lecturer in archæology (more recently head of the Department of Archæology) in the University College, Cardiff, since 1926. For those long years he had held two posts. The second, the teaching of archæology in the College, had, in recent years, expanded from a subsidiary to an honours course as a result of his work.

Dr. Nash-Williams's earliest excavations were a series made in the 'twenties and 'thirties on the Roman legionary fortress of Caerleon. Those which proved to be his last were on the civil settlement which he had long supposed to lie outside the fortress walls in an area still, by good fortune, not built over; the other legionary fortresses of Britain provide no similar opportunity. His suppositions were proved to be correct by his excavations of 1954 and 1955, excavations which he had hoped to continue for many years, for the area is a large one and the promises were good.

He had also conducted important excavations at the Roman town of Caerwent and on the Early Iron Age hill-forts at Llanmelin and Sudbrook in Monmouthshire, and on the monastic site and the Roman villa at Llantwit Major and the Roman auxiliary fort at Neath, in Glamorgan. The results of these and other works are to be found in publications of the National Museum of Wales, or in *Archaeologia*, *Archaeologia Cambrensis* and the *Bulletin of Celtic Studies*.

A field survey of the Roman military sites in Wales led in 1954 to his book "The Roman Frontier in Wales", an up-to-date review of the evidence of the Roman occupation, and a work now indispensable to any serious student of Roman Britain. A comprehensive inventory and survey of the more than four hundred early Christian crosses and monuments of Wales form the subject of his largest work, "The Early Christian Monuments of Wales", published in 1950. It is richly illustrated and does for Wales what Romilly Allen and Anderson's book did for Scotland. This work alone is a memorial of his industry and scholarship.

Dr. Nash-Williams believed that if archæology was to be a live subject, there must be active excavations on one hand, and on the other a continuous exposition of the results to the public. In this, as in other ways, his practice matched his principles. His untiring work in the field and in writing, teaching and lecturing caused his subject and his interests to be widely known, and they, and his personal qualities, made him greatly esteemed. He possessed humility