Science in Ireland

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IT IS A RATHER COMMON BELIEF that the Irish are fonder of fairies than of facts. Nevertheless, in the ardent Celtic temperament we not infrequently find an escapist love of fancy combined with an almost fatalist surrender to facts. Unlike Americans who, accepting reality, immediately begin to think of means to change it, the Irish tend to be fascinated by the order of the world in which they live, and this may, to some extent, account for the fact that their interests lie more in pure than in applied science. Not that applied science does not appeal to them, but for various reasons—predominantly psychological—their inclination intellectually is more to rest in contemplation of an order than in the application of discovery to the dynamic transformation of the circumstances in which they live.

To present even a brief sketch of scientific endeavor in Ireland today is both a difficult and a hazardous undertaking. The contribution of the universities would demand an article in itself, and the limits of space oblige us but to recall that splendid work has been and is being done in many spheres, despite very inadequate financial aid and an overcrowded lecture schedule. American readers are familiar with the name of Walton, a Nobel prize winner of last year, who is professor at Trinity College, Dublin. In this paper we limit ourselves to giving a short account of the Dublin Institute for Advanced Studies, of the work of the Central Statistics Office, and, finally, of medical research.

The Dublin Institute not only sponsors research in Celtic studies, but also possesses a school of theoretical and of cosmic physics. The latter contains two subordinate departments—one on cosmic rays, the other dealing with astronomy. In theoretical physics the senior professors now are E. Schroedinger and J. L. Synge. Walter Heitler, former director of the school, resigned in October 1949 to take up a post in the University of Zurich.

As a result of his lectures in hydrodynamics, Synge has obtained a new and simple condition satisfied by the vorticity and expansion in the plane motion of a viscous fluid in a fixed container. He has also investigated problems connected with the transmission of energy by sonic and electromagnetic waves. Work continues on the method of the hypercircle in function-space for the approximate solution of boundary-value problems. The geometrical basis of the method has been clarified, and arithmetical applications have been made to problems of torsion. In addition, Synge, taking as analogy Hamilton's formulation of geometrical optics, has attempted a relativistic treatment of the two-body problem. Schroedinger has lectured on the geometry of space-time calculated to lead to a new nonsymmetric unified field theory. Among the problems that arose in the course of these lectures, and that were partly solved by Schroedinger and his associate Symmonds, were those of pseudo-energy tensor in the new theory, special singularity-free-wave solutions, and the general solution for a weak charge-free field of electromagnetic waves. Work by Basu concerning the latest development in quantum mechanics included some special collusion problems and the quantization of higher order equations, which led Thirring to an automatic regularization of the commutator function and to finite self-energies. Thirring also succeeded in applying the new formulation of quantum electrodynamics to such problems as pair creation by mesons, Compton scattering, etc.

In the school of cosmic physics directed by L. W. Pollak, a gravimetric survey of Ireland was undertaken. Murphy made measurements at about 260 new stations in central Ireland. It is intended to extend the survey to other parts of the country when Cambridge University will again be able to spare its gravimeter, the only one in these islands. Pollak also continued his investigations of the long-period fluctuations of the frequency of cyclones over the Atlantic and, with P. Nolan, concluded the research into the possibility of seasonal forecasting of the yield and sugar content of sugar beets in Waterford. Tedde and Nolan, investigating the relationship between nuclei and meteorological elements in Dublin, found that there exists a linear relationship between the size of nuclei and humidity, the correlation coefficient being 0.75.

In the cosmic ray section of the school, Professor Jánossy, who has since disappeared behind the Iron Curtain, worked with Mc. Cusker, and with Nevin, of University College, Dublin, on various extensions and refinements of the cascade theory of shower production. These included a new formulation of the fundamental diffusion equation and a study of the lateral spread of air showers. Toward the end of the year 1949–50 Nevin and Mc. Cusker prepared a cloud chamber for an investigation to check the Bhabha-Chakrabarty theory of shower production as applied to the electrons that constitute the soft component of air showers. An apparatus for recording meson decay was constructed by Ritson and used to study the angular distribution of slow mesons. In September 1951 a cosmic ray conference was held in Dublin. Rochester and George, of Britain, lectured on V-particles and properties of M-mesons. The principal Irish speakers were Kelly, now research lecturer in University College, Cork, who discussed heavy nuclei

in primary cosmic radiation and the modes of decay of heavy mesons, and Nevin, whose lecture dealt with wire hexagon counters of large area.

The head of the astronomical section is H. Brück, director of Dunsink Observatory. The chief instruments of the observatory are the solar telescope, and spectroscope, and the 36-inch Schmidt-Baker telescope jointly operated by Harvard, Armagh, and Dunsink observatories. These instruments were used for photometric observation of variable and other stars. Occultations of stars by the moon and sunspots are also observed. Absorption line intensities in the infrared region of stellar spectra were studied by Butler, as well as the spectrum of the variable star Beta Lyrae. Other work included observation of fluctuations of intensity of visible solar radiation on the basis of indirect measurements of the solar constant. At the time of writing, Brück, assisted by Jackson, has used an interferometer to calculate, on the occasion of the Khartoum eclipse, the temperature of the sun's outer atmosphere. Attention was also given to electromagnetic waves and the behavior of light.

The development of statistics in Ireland is as yet practically a matter for the Central Statistics Office, Dublin, although in 1951 a chair of statistics was set up at University College, Cork. The bulk of the statistical and economic data available for the country is collected by the central office, which, in addition to reports on special topics, publishes periodically in monthly *Trade Statistics,* the quarterly *Irish Trade Journal,* the *Statistical Bulletin,* and the annual *Statistical Abstract.* The office is responsible for vital statistics and for the censuses of population, which prior to 1946 were taken at decennial intervals. It has provided a unique series of figures concerning agriculture, area under crops, output, etc., for each year since 1847. It undertakes a complete census of industrial production annually, has carried out the first census of distribution in Europe in 1933, and will resume the inquiry on an annual basis from 1952. Various series of price index numbers are computed, covering retail and wholesale prices, etc. The office also prepares and publishes annually the *Balance of International Payments Statement.* It provides information on unemployment, foreign trade, education, and a variety of other social, economic, and financial matters. It produces the raw material for research and, in addition to the data required for administrative action, to some extent carries out the analyses. The technical staff consists of the director, Dr. Geary, deputy director, Dr. McCarthy, and five statisticians. This intensely active group, in addition to the official work, prepares and publishes original papers on both applied and theoretical subjects.

A final word on recent medical research in Ireland: Owing to the interest of the former Minister for Health, an examination of the tuberculosis problem was begun, with particular reference to clinical, social, and economic analysis of representative samples, study of the progress of disease, extent of infection, of available statistical information, and of most suitable methods of case finding, domiciliary care, etc. As regards cortisone, Ireland was one of the first countries to attempt clinical tests with the new drug. With a team of workers, Professor Moore, of University College, Dublin, treated (1949–50) over 35 cases of rheumatoid arthritis, over 100 cases of diseases of the eye, and a number of cases of toxemia of pregnancy. Hingerty, attempting to reach a more complete understanding of the primary metabolic function of cortisone, has investigated the effect of the hormone on the electrolyte permeability of muscle tissue, on certain aspects of carbohydrate metabolism, and on certain inorganic constituents of muscle and plasma. In bacteriology, Bigger, of Trinity College, assisted by Ware and Boggust, examined the action of sulfathiazole on *Bacterium coli* in fluid culture media. Conway, of U.C.D., already known to SCIENCE readers, has continued research on the acid production and electrolyte exchanges in yeast. Cocker, of T.C.D., has continued work on ψ santonin. Barry, Twomey, and Belton have done excellent work on the chemotherapy of tuberculosis. In dermatology F. O. Meenan has continued research on the culture and identification of fungi affecting the skin and its appendages. In gynecology Bradshaw has continued his investigations concerning urinary steroid excretion in normal cases during the last month of pregnancy, labor, and the first days of puerperium. Donovan and Counihan, of University College, Cork, have reported on cardiac murmurs and thrills, and are doing research on cases of chronic cor pulmonale. Kane and Law, of the same institution, have continued work on neuroganglion of circumvallate papillae of the pig's tongue. Kiely is proceeding with research in surgery and hopes to incorporate his findings in the second edition of his work on surgery. E. F. McCarthy, in the Low Temperature Laboratory at U.C.D., is progressing with his study of proteins of plasma and other fluids of biological interest. With E. I. McDougal he is publishing a work on the "Absorption of Immune Globulin in the Newborn Lamb." In his virus laboratory at St. Vincent's Hospital P. N. Meenan continues his research on the etiology of virus pneumonia in Ireland. In the influenza epidemic of 1950, five strains of virus were isolated, and it was shown that the subtypes responsible for influenza all over the world that year were also present in Ireland. The spread of the epidemic, it was noted, appeared to be by continuity of district, rather than by lines of communication.

The problem of the advancement of science in Ireland is to no small extent a financial one—meager and insufficient funds are available. Besides the financial circumstances, certain psychological factors tend to inhibit the full deployment of the energies of those inside (and outside) the scientific field. It is to be hoped that in the near future, with more funds (wherever they may come from) and greater facilities, the nation will be enabled to realize all its potentialities and to make the contribution of which it is capable toward scientific knowledge, its own welfare, and the happiness of mankind.