

Relations of the Flora and Fauna of Ireland to those of other Countries*

AS the most western land of the great Eurasian continent, Ireland is of peculiar interest. It, like Great Britain, stands on the Continental shelf and is surrounded by a mere film of water as compared with the oceanic depths prevailing to the west. Floral and faunal movement has been chiefly east to west. The opposite has been rare, as suggested by such organisms in the British Isles which are restricted in area, and have a range, often discontinuous, which suggest relict rather than insipient distribution. They would appear to be mostly broken-up remnants of past invasions rather than the first colonies of new species destined to push eastward.

The high winter temperature has allowed of the migration northward of plants and animals which elsewhere in Europe are confined to lower latitudes—the Mediterranean region and the Spanish peninsula chiefly. Mixed with these, in Ireland, especially in the west, are a small number of plants and one animal—the freshwater sponge *Heteromeyenia ryderi*—which belong to North America. There are many other problems of distribution which give to the flora and fauna of Ireland a special interest.

In spite of the instability of the earth's crust and of climatic conditions in and around the British Isles during recent geological times, the occurrence of various extraneous elements derived from the south and from the west, as well as the absence from the British Isles—one or both—of many widespread Continental types raise interesting questions. The effects of intermittent water barriers must also be considered.

In spite of the generally low level of the British Isles, submergence has been only very partial from, say, the beginning of the Tertiary period, and only in eastern and south-eastern England do Tertiary marine deposits point to the disappearance of that region as a land surface during much of the Eocene, Oligocene and Pliocene periods.

The sea forms a very effective barrier to plant and animal transport, except for winged creatures. Even as seeds, plants cannot travel very far by sea, for the author has shown that the seeds of 786 different British plants sank either at once or within the course of a few days. Transport of seeds by wind is not very successful. Only plumed seeds have at all a high efficiency. Reduction in size in the seeds of Phanerogams has not gone far enough, and winged seeds are not efficacious. The best results are obtained by seeds which combine reduction in size with a plume of hairs such as those of *Typha* and *Epilobium*. Clearly, normal transport by wind may for practical purposes be ruled out except for a few especially efficient seeds and for very narrow barriers.

Transport of seed by animals over sea must be confined to birds. They are, indeed, efficient agents of dispersal, provided the barriers are not wide, for digestion in birds is very rapid. Migrating birds have been shown to arrive empty of food and without seeds adhering to their feet or feathers.

Furthermore, success does not follow merely from

the surmounting of the barrier. The main difficulty—successful colonization—still confronts the individual.

The flora of Ireland as compared with that of Britain, and of Britain as compared with that of adjoining Continental countries, do not display any undue proportion of those plants which, by having floating seeds, might have arrived by water; or those which, having flying seeds, might have come by air; or those which are eaten but not destroyed by birds, and might, therefore, have arrived through their agency.

The case for terrestrial, and not trans-marine, immigration is greatly strengthened by considerations of the fauna, and thus are we led to looking for land-connexions in order to account for the present peopling by plants and animals of the British Isles.

Land-connexions have existed during a good deal of recent geological time, and the question follows as to the period or periods of immigration. This raises the problem as to how much of the pre-existing flora and fauna was exterminated by the Ice Age and how much survived. Forbes in 1846 concluded that certain groups in Ireland, including the southern or Lusitanian element, survived the Ice Age, while the bulk of present plants and animals owe their presence to terrestrial immigration in post-Glacial time. Forbes also accounted for the comparative paucity of the Irish flora and fauna in relation to those of Britain by the breaking down of the Irish-British land-connexion prior to the severance of Great Britain from the Continent. Though many agree with Forbes, others have expressed divergent opinions—several, such as Stapf and J. R. Mathews, expressing the view that practical extermination took place during the Ice Age.

The crux of the problem rests on whether during the Ice Age there were ice-free areas with reasonable climatic conditions or whether there was a continuous ice sheet. In the later event, complete extermination seems inevitable and post-Glacial immigration must have been vigorous. But there is no evidence of simultaneous glaciation over the whole of Ireland. In fact, evidence is to the contrary. Thus there is no need to postulate complete extermination during the Ice Age. Further support is given by present-day Greenland, which is probably no better now than Ireland was during the Ice Age, and in Greenland there are four hundred flowering plants and ferns and more than 1,500 lower forms of plants. The same refutation of extermination can be made for England.

The present-day Lusitanian flora and fauna are represented on the Continent chiefly in Spain. These reached the southern British Isles by overland dispersal. The American species in Ireland are of the northern American type, and since none of the species occurs in Siberia, presumably followed the shorter Atlantic route via Greenland and Ireland. None of them occurs in Europe south of Ireland. They probably arrived in Ireland during a pre-Glacial epoch. There is a corresponding group of

* Substance of the Hooker Lecture delivered by Dr. J. Lloyd Praeger before the Linnean Society of London on May 11.

European plants in a limited area of north-eastern North America; this clearly represents a similar migration in the opposite direction. These species, both in America and in Ireland, by their very nature could not have migrated across wide stretches of sea. A relatively high land-level may have existed in the late Pliocene, but it must be admitted that the whole matter of these migrations bristles with difficulties.

The flora of Ireland (1100 species of Phanerogams and vascular cryptogams) is only little more than half that of Great Britain. The greater area, range of latitude, and diversity of surface and soil of the latter cannot wholly explain this paucity in flora and fauna of the former. There is little doubt that

many of these British species would have invaded Ireland had they been able, but the Irish Sea formed the barrier to western migration, while Britain was still connected by land with the Continent.

There are, too, many interesting, but puzzling cases of discontinuous species in Ireland, occurring only in one or a few bare patches. It is possible that they have been introduced by air from across channel to places unsuited for them. There are, also, certain species more successful in Ireland than in the sister island. The outstanding problems of the Irish flora and fauna are still many and varied, and the study of fossils and of peat can be expected only to reveal part of the story. But research is going on apace.

Medicine in the Renaissance

THE Institute of the History of Medicine at Johns Hopkins University in Baltimore, which is the only one of its kind in the United States of America, was the last creation in 1929 of that remarkable and radiant personality, William Henry Welch. "My ambition," he wrote to Dr. L. W. Weed, dean of the Medical School, in a letter dated November 21, 1927, "is to create a real institute of medical history with a good reference library and a salaried staff, where facilities are offered not only for teaching, but for serious study and research. A 'Lehrstuhl' merely is not enough". The professorship in the history of medicine in the University was originally intended as a retirement chair for Dr. Welch who, however, insisted on the organization of a properly equipped department. He was succeeded by Dr. Henry E. Sigerist, a former director of the Institut für die Geschichte der Medizin at Leipzig, who, with his magnetic personality, relentless energy, and immense erudition, has built up a magnificent institute serving the triple purpose of research, education, and nucleus for medico-historical activities in the country. Supported by a grant from the Rockefeller Foundation, it is situated on the top floor of the William H. Welch Medical Library. Dr. Sigerist is ably assisted by his associates Drs. Owsei Temkin, Ludwig Edelstein, John Rathbone Oliver, and Sanford V. Larkey. Initially designed as a house-organ, to contain papers written by members of the Institute and by others connected with the University, in January 1933 the *Bulletin of the Institute of the History of Medicine* began to appear as a supplement to the *Johns Hopkins Hospital Bulletin*, from 1935 functioning as an independent organ. At the beginning of 1939 it changed its name to "Bulletin of the History of Medicine. Organ of the American Association of the History of Medicine and The Johns Hopkins Institute of the History of Medicine".

So successful was the first Graduate Week in Medical History held at the Institute in April 1938 that a similar course was planned for the week of April 24-29, 1939. While last year's programme dealt with the principles and methods of research and teaching, the subject this year was "Medicine in the Renaissance". The course was attended by thirty-nine medical historians and students of the Renaissance, including Prof. Leicester Bradner, of

Brown University; Dr. Iago Galdston, of the New York Academy of Medicine; Prof. Richard H. Shryock, of the University of Pennsylvania; Dr. Kate Campbell-Hurd Mead; Dr. Benjamin Spector; and Dr. Richmond C. Holcomb. Each morning a lecture, illustrated by an exhibit of the most authoritative literature, and followed by a discussion, was given by Dr. Sigerist and by members of his staff, and the afternoons were devoted to informal round-table seminars. The programme was carefully planned so as to leave sufficient time for individual work and for conversation with the director and his associates.

In the opening lecture on April 24, entitled "Economic, Social, and Political Foundations of the Renaissance", Dr. Sigerist described the medieval world as a static world in which man was born into a definite place and function. Everything was dominated by religion. When the new period started, the system of feudalism began gradually to disintegrate. The struggle between the old and the new orders lasted for three centuries, for feudalism in Western Europe was only overthrown by the French Revolution. The Reformation had enormous economic repercussions: it broke the doctrine of the Church that production is for service only and that the idea of profit is sinful. The fifteenth century witnessed a great development in finance and banking, better and shorter ways of traffic were sought, Western Europe was linked with the New Worlds, and navigation proved a great stimulus to science. Everywhere man felt his individuality, which he desired to apply to a definite purpose. The afternoon's seminar was given up to a discussion of "The Concept of the Renaissance". The term "Renaissance" was first used in art by the sixteenth century Italian art critic and painter Giorgio Vasari. Its technical use dates from Jacob Burckhardt's book "Die Kultur der Renaissance in Italien", 1860. In the evening a play was performed at the Baltimore Museum of Art "The Black Dart of Death", adapted by Dr. Larkey from William Bullein's "A Dialogue against the Fever Pestilence", 1564.

The following day's programme included a lecture by Dr. Edelstein on "Ancient Traditions in Medieval and Renaissance Thought", a seminar on "Bibliographic Problems of Renaissance Literature", and an evening meeting of the Cordell Historical Society of the University of Maryland in the chemical hall