

is almost inconceivably great. It is possible to argue that a species whose variability can produce nothing more than local races during the period of its dispersion will, in the course of geological time, give rise to differences of specific or even greater significance. Such an argument, while bringing us no nearer to the root of the problem, serves to emphasise the importance of the time-element.

Many, but not all, of the differences shown by local races can be correlated with the conditions of their habitat, so that the direct influence of environment on the trend of variation becomes conceivable. Almost the same generalisation can be applied to palæontological 'lineages', with the same reservation. In both cases, any influence due to environment must be slight, and within the capacity of the organism; the alternative is extinction.

In this connexion, it is salutary to remember that almost every conceivable kind of environment exists somewhere on the globe; and, for many types of organisms, is not wholly inaccessible. When viewed in geological perspective, this condition is just as true, and its implications seem clear. An episode in the history of the sea-urchins may be cited in illustration.

So far as can be determined, the earliest sea-urchins lived quietly on the silt of sheltered lagoons; throughout the Palæozoic era they remained for the most part content with this kind of environment. But near the beginning of Mesozoic time a strange 'wanderlust' seems to have overcome some of these sea-urchins, evoking rock-dwelling types of which *Echinus* is a familiar representative. There must have been wave-swept

rocks around Palæozoic seas; and there are plenty of areas of sheltered water to-day. *Cidaris* (by conservatism) and the heart-urchins (by reversion) still frequent the traditional quiet places; but *Echinus* and its relatives prefer the buffeting of the surge. The adaptation of each type to its habitat is almost teleologically perfect. But which came first, the habitat or the structures to fit it? Herein lies the dilemma. We must envisage either a gradual migration of successive generations of selected Triassic sea-urchins, travelling further into rough water as their variations permitted; or an almost infinitely slow invasion of some lagoons by the breakers. Both explanations seem to the last degree improbable.

An impasse of this kind can only mean that an essential factor has been left out of the calculation. In his laudable endeavour to avoid crediting lower types of organisms with attributes that belong to himself, the biologist has perhaps gone too far, and has treated his subjects as if they were as passive as inorganic matter.

To be alive is to be in active revolt against the cruder physical laws. Without the instinctive urge that is expressed among mankind in pioneering exploits, all protoplasm might still be content to remain amœboid.

This contention does not in any way solve the mystery of variation; but it widens the scope of the inquiry. For living beings, the attributes of variability and 'choice' must be stronger influences than the impact of inanimate environment. Every organism must triumph over its environment, find a new one, or perish in the attempt.

HERBERT L. HAWKINS.

Obituary

Mr. E. Thurston, C.I.E.

WE regret to record the death of Mr. Edgar Thurston, formerly superintendent of the Government Museum, Madras, which took place at Penzance on October 5 at the age of eighty years.

Edgar Thurston, the second son of Charles Bosworth Thurston, was born at Kew and educated at Eton and the medical school of King's College, London, qualifying as L.R.C.P. in 1877. He was appointed superintendent of the Government Museum, Madras, in 1885, retaining that position until his retirement just under twenty-five years later, when he was made C.I.E. He had already received the award of the Kaiser-i-Hind gold medal in 1902. After his retirement he returned to England, and continued to devote himself to research. He was much interested in the study of the Cornish flora,

publishing "British and Foreign Trees and Shrubs in Cornwall" in 1930.

As superintendent of the Madras Museum, Thurston took an active interest in all the branches of scientific study in the Presidency which came within the purview of his duties; but as was shown by his numerous contributions to the official publication of the Museum, his main preoccupation lay with anthropology. Here he took the broadest view of the functions of the museum man, and by no means confined his attention to material culture and its contributory research. He acquired a knowledge of the mentality of the varied peoples of the Presidency and a keen appreciation of their differences, which at times was little short of surprising. The results of his earlier studies were embodied in "Ethnographic Studies in Southern India"; but his

wide and detailed knowledge of social institutions, customs and beliefs, enriched by the information collected in an ethnographical survey, which he conducted in 1902-9, appeared to advantage in his "Castes and Tribes of Southern India" (1909), in which he added to his own observations a digest of a vast amount of other material. No less remarkable in the character of its observations and its originality was "Omens and Superstitions of Southern India", a book which has proved of the greatest interest and value to students of folklore and religion.

Thurston was ever generous in placing his material at the disposal of others. Not only were his researches of the greatest utility to Sir Herbert Risley in his ethnographic survey work in India, but also it was largely owing to Thurston's assistance, which extended from the organisation of transport to counsel and information in matters of ethnographic detail, that the late Dr. W. H. R. Rivers owed, as he himself acknowledged, the remarkable achievement of his anthropological investigations among the Todas of the Nilgiri Hills. Thurston's retirement was a loss to anthropological studies in the Madras Presidency, of which the effect is still apparent. No one has quite taken his place.

WE regret to announce the following deaths :

Prof. G. Buchbock, professor of chemistry in the University of Budapest, aged sixty-six years.

Dr. H. W. Dudley, O.B.E., F.R.S., of the National Institute for Medical Research, known for his work in biochemistry, on October 3, aged forty-seven years.

Prof. Rhoda Erdmann, director of the Institute for Experimental Cytology in the University of Berlin, and editor of the *Archiv für Experimentelle Zellforschung*, on August 23, aged sixty-four years.

Mr. G. H. Hamilton, official astronomer in the Jamaica branch of the Harvard Observatory in 1922-24, and since 1924 astronomer of the Hamilton Observatory, Mandeville, Jamaica, on August 6, aged fifty-one years.

Mr. W. K. Laurie-Dickson, who was associated with Mr. Edison in studies of the Edison effect, and for many years superintendent of the Edison Electrical Works, on September 28, aged seventy-five years.

Major R. F. Stirling, director of veterinary services, Central Provinces, India, known for his work on animal diseases, especially rinderpest, on August 16, aged forty-eight years.

News and Views

Safeguarding of Peace

"COLLECTIVE Security" is a problem which to-day is thrust upon the notice of every newspaper reader. Few of them are aware that to the scientific investigation of this same problem in international relations two whole years have just been devoted by a score of national groups and institutions affiliated to the Permanent International Studies Conference. At the London session of the Conference, held last June, the investigations culminated in a discussion directed more particularly to four essential aspects of the subject: the notion of collective security, the prevention of war, determination of the aggressor and sanctions, and the question of neutrality. The major portion of the deliberations was devoted to the principle of the organisation of pacific systems destined to eliminate the causes of war to the fullest possible extent. In connexion with the repression of war, the discussion turned on regional agreements and the relative value of various forms of sanctions, notably economic and military. There followed an examination of the notion of neutrality and the different forms it may assume when the collective machinery set up for the safeguarding of peace has to be put into operation. The subject chosen for the next Study Conference to be held in 1937 is 'Peaceful Change', with special reference to questions of (a) population, migration and colonisation, and (b) markets and the distribution of raw materials. The proceedings of the London session are summarised in Appendix 6 to the Report of the International Committee on

Intellectual Co-operation (League of Nations Publications, 1935, 12, 42. Allen and Unwin, 2s. 6d). The same report outlines definite proposals submitted by M. Jean Gérard, secretary-general of the International Union of Pure and Applied Chemistry, for establishing closer collaboration between the International Committee on Intellectual Co-operation and the International Council of Scientific Unions. The proposals are to be laid before a special committee of this Council, appointed to deal with the subject.

New Commission of the R.R.S. *Discovery II*

THE Royal Research Ship *Discovery II* left London on October 3 on her fourth Antarctic commission. The voyage is expected to last for some twenty months, and, as on former occasions, the work is primarily concerned with observations on the distribution and environment of the whales which form the basis of the southern whaling industry. According to the programme which has been arranged, the ship, after calling at Cape Town, will circumnavigate the Antarctic continent, returning to South Africa in June 1936. The distribution of whales near the ice edge will be examined in each sector of the Antarctic, and series of stations with full observations on the hydrology and plankton will be taken on lines extending from the pack ice to the warmer waters north of the Antarctic convergence. This circumnavigation is being made in the summer months, and will be complementary to that undertaken in the winter of 1932. The work is controlled by the *Discovery* Committee