

MARINE ECOLOGY AND THE FISHERIES

WITH the present two numbers of the *Hull Bulletins of Marine Ecology*, volume 1 is complete*. Of volume 2 four numbers are already published and three are in the press. Prof. A. C. Hardy, editor of these bulletins, in his explanation at the beginning of volume 1 gives an excellent simplified résumé of the whole. Ecology as he defines it "is establishing the relationship between a creature and its surroundings in terms of quantity". He sketches the gradual growth of marine ecology with admirable clarity, its scope, early history, and the beginning of the work at Hull leading to all these researches. This work, planned by himself and successfully carried out, includes his invention of the plankton indicator and, following this, the plankton recorder, both of which have proved to be of real help to the fishery industry. Here a story is told in the simplest terms which is of special interest and importance. It has always been Prof. Hardy's aim to bring science and industry together. How successful he has been is shown in the tributes paid to him by the skippers of the vessels which have his apparatus in use.

His explanation proceeds to summarize each bulletin in volume 1. Again as simply as possible the contents of each part are explained, with clear diagrammatic illustrations of apparatus and of planktonic organisms. This is an excellent method of introducing the work to non-specialists.

No. 6, concerned with the main plankton survey, deals with the monthly changes in the zooplankton other than Copepoda and young fish as shown by the plankton recorder. Here the seasonal changes are much in evidence, and the distribution of *Sagitta*, *Limacina*, *Cliene*, Lamellibranch larvæ, *Cladocera*, Caprellid Amphipoda, Decapod larvæ, Echinoderm larvæ and *Oikopleura* is shown in series of monthly charts, while the seasonal fluctuations are compared in time-chart histograms.

These researches have been suspended for the present; but it is hoped that they may be developed in several directions for a long period in the future.

* *Hull Bulletins of Marine Ecology*, edited by Prof. A. C. Hardy and Dr. C. E. Lucas. Vol. 1, pp. i-xliii, October 1944, 3s. Title Page, Contents Table, List of Personnel, Preface and Explanation. Vol. 1, No. 6, pp. 255-275, Plates cxvii-cxlix. July 1944, 4s. Continuous Plankton Records. The Zooplankton (other than Copepoda and Young Fish) in the Southern North Sea, 1932-37, by Dr. G. T. D. Henderson and N. B. Marshall.

THEOLOGY IN AN AGE OF SCIENCE

IN his inaugural lecture at the University of Oxford on November 3, 1944 (Oxford: At the Clarendon Press, 2s. net), Prof. Leonard Hodgson, regius professor of divinity, asked how the voice of theology is to be heard in a scientifically minded age. Must it not inevitably belong to a world of thought alien to the scientific outlook?

Science has been defined by Dr. C. H. Waddington as "the organized attempt to discover how things work as causal systems". This view assumes that all events are explicable in terms of causal systems (or that there are no events lying outside the range of scientific study). In this case, does the fact that psychologists and sociologists are recognized as men

of science mean that all human behaviour can be accounted for on causal grounds? Or that they can study only such aspects of it as are thus causally explicable?

To take the former view is to beg a very large question; to take the latter is to assert that there can be no scientific study of such purposive behaviour as is explicable in terms not of causes but of reasons—a limitation which psychologists and sociologists would reject.

The fact is, remarks Prof. Hodgson, "we live in a world in which there are two orders of events—those which follow from causes, and those which are done on purpose, for reasons". Thus, if science limits itself strictly to the causal order it can only deal with one part of our experience.

If theology is a science, it would presumably deal with a subject-matter not dissimilar to those of psychology and sociology, that is, events which are done on purpose, for reasons.

Rejecting the traditional idea of revelation as "erroneous and untenable", Prof. Hodgson declares that "the divine revelation is not given in the form of propositions conveying a ready-made knowledge, but in events which are divine redemptive acts". These acts, and the evidence for them, it is the business of theology to study, and here lies its claim to be a science.

"Theology is itself one of the sciences—the empirical study of the evidence for certain mighty acts of God in the history of the world."

To be scientific, such studies would have to be wholly unprejudiced. Of course the evidence for some of these events, and these not the least important, is not easy to establish: and it is perhaps not justifiable to speak of these events, as Prof. Hodgson does, as "a certain sequence of events which, as events, are as observable as any others".

Theology then would appear to be a science in the same sense as history is one. But to divest theology of its philosophical aspects would be to divest it of most of its interest and depth.

RESOLUTION OF EXTRAGALACTIC NEBULÆ

UNLIKE the other nebulae in the local group, the two companions of the Andromeda nebula—M 32 and NGC 205—and the central region of the Andromeda nebula itself, have hitherto defied resolution into stars by the most powerful instruments at the disposal of astronomers. It was therefore supposed that the luminosity of their brightest stars was abnormally low. This conclusion is amply confirmed by the resolution of these objects on plates taken recently on the 100-in. telescope (W. Baade, *Astrophys. J.*, 100, 137; 1944).

Some time ago, unexpected signs of incipient resolution on ordinary plates taken under good conditions gave grounds for hoping that further refinements of technique would lead to complete resolution. This has now been achieved by the use of red-sensitive plates behind a filter passing only the region 6300-6700 Å., so as to avoid the strong night-sky emission. Only nights of exceptional definition were used, and only these if the temperature variations were such as to minimize changes of form of the 100-in. mirror. The plates were obtained with exposures of the order of four hours, and show that