

## NATURE AND COGNITION

## Natur und Erkenntnis

Die Welt in der Konstruktion des heutigen Physikers. Von Prof. Arthur March. Pp. viii + 239. (Wien: Springer-Verlag, 1948.) 21s.

THE author, who is well known as one of the pioneers in the field of quantum theory, has in this book made the attempt to present the fundamental ideas of modern physics without the use of mathematics in such a way that an intelligent reader could really understand their implications. For this purpose it is of paramount importance to analyse in everyday language the hidden meaning of the mathematical formalism. This is a tremendous task, and it seems doubtful if readers who have no knowledge of higher mathematics can in this way be made to understand what is meant by infinite matrices, eigenvectors, invariants, etc. A few chapters are devoted to the discussion of the nature of particles and of waves, and the author makes every effort to explain the apparent contradiction between the two aspects of one and the same phenomenon. In spite of this, I think, the average reader will sometimes feel rather giddy from the exertion of having constantly to change his angle of view during complicated discussions, like the one on the meson theory of nuclear forces.

The most important part of the book is that in which the author attempts to explain, in a generally intelligible way, the idea of a fundamental smallest length in Nature, and in his foreword he confesses that he has written the book mainly for this purpose. As the Planck constant  $h$  restricts the detailed description of events and reduces them to 'elementary acts', similarly the existence of a smallest length  $l_0$  restricts the measurement of space (and consequently of time), and puts a limit to the analysis of space and time relations. It is shown how by the introduction of this new principle certain serious difficulties concerning the interaction of fields and particles can be removed satisfactorily.

The author also tries to make the reader acquainted with the philosophical implications of the quantum theory. His own attitude as that of a 'phenomenologist' is to object to the use of 'not measurable' quantities in a physical theory although he raises no objections against the use of continuous coordinates (which are not measurable according to the principle of a smallest length) or against the use of complex wave functions (which are not 'observable' quantities in quantum mechanics). He maintains that present-day quantum theory already provides the fullest possible description of the physical world and that we simply have to accept as a not further explicable fact that the individual phenomena are not subject to the law of causation, but that it nevertheless applies to mass phenomena. This sounds rather like Du Bois Reymond's defeatist "ignorabimus", and the majority of scientific men will prefer Hilbert's famous motto: "We must know and we shall know".

The book is not intended to describe the historical development of the ideas to which it is devoted, and so the names of the discoverers of the most important facts and ideas are only casually mentioned. But certain omissions are to be regretted; although, for example, the statistical interpretation of quantum mechanics forms one of the main fundamentals of the author's discourse the name of the originator of this idea, Max Born, is not even mentioned. The in-

clusion in the book of a short historical review with names and data and references to original literature, and an index of subjects and authors would certainly increase its value.

The book makes very enjoyable reading because of the charming way in which the subject is presented, although it was written under most distressing external conditions. It is to be hoped that it will be translated into English so that it may become available to a broader public in this and other countries.

R. FÜRTH

## A REVIEW OF TRACER WORK

Dix ans d'application de la radioactivité artificielle. By Dr. Pierre Süe. Pp. 258. (Société d'Éditions Scientifique, Paris, 1948.) 675 francs.

THE Scientific Information Conference held by the Royal Society during June 21–July 2 has directed the attention of wider circles to the importance of the work of abstractors and reviewers for the progress of science. One of the Conference's recommendations was that "senior scientists should regard the provision of reviews as an important ancillary to the pursuit of new knowledge". It is obvious that the need for such help is greatest in rapidly expanding branches of science, as, for example, radioactivity.

That scientific workers in other countries are of the same opinion is shown by the survey on the use of radioactive tracers just published in Paris. The author is Dr. P. Süe, research director in Prof. Joliot's Laboratoire de Chimie Nucléaire. It represents a practically complete compilation of the relevant literature up to September 1947. The essential part is a chapter in which the material is arranged according to the subject of the researches; if the title of a paper does not seem sufficient, a brief summary of its content is added. Only the author of the paper and a number are given in these tables; the bibliographic reference is to be found in the succeeding alphabetic list of author names. If there are several authors, only the first one is mentioned, which makes it, unfortunately, impossible to trace in this way the other authors whose existence is indicated by an "et al." only. A third list which will frequently prove helpful arranges the papers according to the radioelements used.

The book begins with a survey of all radioactive nuclides, based largely on the well-known tables published by Prof. G. T. Seaborg in 1944. The fact that the author found it advisable to reproduce, for the benefit of his readers, so much published material shows very clearly the present weakness of our arrangements for the distribution of scientific information; for the re-setting of such complicated tables is an unpleasant task where the danger of misprints can only be avoided by very time-consuming proof reading. However, the printers and correctors seem to have been very successful, more so here than in other parts of the book; but for the errors which do occur in this first edition, certainly no excuse is needed. One regrets that, besides misprints, different types of lettering have sometimes been used by the printer without any apparent reason, and that there is no clear system in abbreviating the titles of the scientific journals, one and the same appearing under very varied contracted forms. It would no doubt have been useful to add a list of the