

ledge and experience of the science of immunology can supply. As they stand, the chapters dealing with the basic data must give a somewhat confused picture to health officers to whom the book is chiefly addressed, and to the bacteriologist some feeling of irritation at the mishandling of his archives. In spite of these faults, the book is a veritable mine of information on epidemiological data of every kind and will, we are sure, prove a highly appreciated work of reference. Misspellings, particularly of proper names, are unfortunately rather numerous.

Airgraphics. By Alexander McAdie. Pp. 37 + 7 plates. (Cambridge, Mass.: Harvard University Press; London: Oxford University Press, 1931.) 12s. 6d. net.

PROF. MCADIE has brought together a number of physical formulæ and conversion tables of interest to meteorologists. There are also diagrams showing various relationships such as that between temperature and height up to a height of about 25,000 metres in different latitudes in summer and winter. But the value of the work must surely be reduced by the absence of a table of contents and of both preface and index. The absence of a preface makes the task of the reviewer a difficult one, the exact purpose of the work being a matter of conjecture. Matters would not be so satisfactory if the diagrams were self-explanatory. Fig. 2 is entitled "Kilobar, Kilograd and Kilometer Scales"; there are three curves labelled "pressure", "density" and "temperature"; these words also appear against the horizontal axis, while "kilometers" appears against the vertical axis. The curve for temperature bears no resemblance to average or individual curves for temperature and height in the earth's atmosphere, which seems to negate the idea that the kilometres are heights. The meaning of the figure is a mystery.

The letterpress begins abruptly on an unnumbered page with a long quotation from Shaw's "Manual of Meteorology", followed by a few comments on this quotation. With the next page a comparatively consecutive narrative begins under the heading "Simplifying Symbols"; suggestions are made as to what symbols should be used in meteorology, and numerous conversion tables and physical formulæ follow. The title of the work is not a good clue to its contents, for whereas eighty per cent of it is occupied with these last items, there is no discussion of graphical methods of presenting upper air relationships and the graphs are its weakest feature. E. V. N.

Constitution of Atomic Nuclei and Radioactivity.

By G. Gamow. (The International Series of Monographs on Physics.) Pp. viii + 114. (Oxford: Clarendon Press; London: Oxford University Press, 1931.) 10s. 6d. net.

MR. GAMOW leaves one with a curiously unsatisfied feeling, for in no instance has the quantum theory of the nucleus, his main theme, solved any of the problems encountered with the finality—fictitious,

perhaps, but nevertheless apparent—that it has attached to so many other aspects of atoms. The lack of success increases as one moves inwards. Well away from the nucleus, the α -particles and nuclear β -particles and γ -rays are almost old friends with regular habits; the potential barrier which they have to traverse to gain their freedom is also fairly well understood in general terms; but the region within this where they have their origin, which can be studied mainly only by its essentially abnormal conduct when it disintegrates, is largely *terra incognita* still.

Mr. Gamow's book has three principal objects. First, it provides a summary of those results of experiment which are likely to be of the greatest significance in the development of the theory, which proceeds more or less concurrently. In this choice there is naturally a certain amount of individual opinion, but it is doubtful if the selection could have been made better. Evidently much more information is required to test the theory as far even as it has been taken, but it may be confidently expected that recent improvements in technique and the complete working out of the intrusion of optical spectroscopy will provide this before long. Secondly, it develops the initial ideas of Gamow, and of Gurney and Condon, on the properties of the potential barrier, particularly those which are connected with the Geiger-Nuttall law of α -particle ranges; and lastly, and it is here that it is specially important, it contains an examination of the relations likely to exist between the main types of nuclear radiations, both spontaneously and artificially excited, on certain hypotheses, the most fundamental of which is that the extra-nuclear quantum mechanics gives an indication of what may be expected to occur internally.

Mr. Gamow has had the assistance of Miss B. Swirles in the preparation of the English manuscript; the result is a well-written and interesting production, the main faults of which are the absence of an index and of references to other theoretical work.

Microbes and Ultramicrobes: an Account of Bacteria, Viruses and the Bacteriophage. By A. D. Gardner; with an Appendix by G. R. de Beer. (Methuen's Monographs on Biological Subjects.) Pp. viii + 120. (London: Methuen and Co. Ltd., 1931.) 3s. 6d. net.

DR. GARDNER has added another good biological book to this excellent series. He does not attempt to deal with the whole of microbiology but, after a rather scrappy chapter on the structure and functions of bacteria, he gives good and stimulating accounts of bacterial variation, the ultramicroscopic viruses and the bacteriophage, as up to date as any version of these moving topics can be and adapted for the general biologist as well as the technical specialist. There are a few mistakes; for example, distemper vaccine is not made in guinea-pigs (p. 65). Mr. de Beer adds an appendix pointing out the analogy between genes and viruses.