

to cover in one volume so large a part of microbiology even at an elementary level. This is a formidable task requiring good judgment and much boldness on the part of those attempting it. The present authors have made their task more difficult because they give no references, either to original literature or to other books, monographs and reviews. Thus there is no opportunity of indicating to the student further reading related to topics which are treated, of necessity, superficially. This lack of references is a distinct defect in what is otherwise a useful elementary text-book in a field where few exist. Surely students should be introduced as early as possible to selected examples of original literature, both for its intrinsic value and as training in appreciation and accuracy of bibliographical reference. Citations of literature for further reading would have greatly enhanced the value of this book and would, moreover, have helped the authors to cope with the multiplicity of topics they mention.

B. C. J. G. KNIGHT

## APPLIED METEOROLOGY

### Climate in Everyday Life

By Dr. C. E. P. Brooks. Pp. 314. (London: Ernest Benn, Ltd., 1950.) 21s. net.

THIS book has been written to assist all whose vocation it is to supply human needs, whether the needs are electric power, houses and factories, food or clothing. Sometimes one thus engaged does not know the climatic factors important to his work. When he does know the factors, the text and data in the standard books on climatology will usually not answer his questions directly. Often some complex combination of meteorological elements is concerned, or the data in the books are not in the right form. Such professional people and meteorologists (among whom the author of this book has been prominent) working together have, however, found for many subjects the right questions on climatic factors and given the right answers to the questions. The published results of this collaboration are scattered in a multitude of technical books and periodicals which Dr. C. E. P. Brooks here summarizes in a masterly style.

The book is divided into three parts: living with climate, climate as an enemy, and control of climate. The first part opens with chapters on the broad effects of climate on the general way of life and human energy and on the design of houses and factories, and goes on to a long description of the climates of the world written from the economic point of view. The second part deals with climate in relation to the deterioration of materials under the effects of heat, damp and frost, with atmospheric pollution and with climatic accidents, which covers heavy rains, hail, lightning and strong winds. The packaging of goods for export to the tropics is dealt with in particular detail in this part. The third part begins with a study of the climatic data needed for designing heating, air-conditioning and lighting systems, and for selecting appropriate clothing. It continues with the protection of crops against dry winds and of buildings from lightning and the more difficult and speculative matters of fog dispersal and the inducing of clouds to rain but not hail on the crops. Finally, there is a world-wide set of brief climatic tables and a bibliography of about a hundred and fifty references.

Some aspects of applied meteorology, notably the physiological ones, are more fully covered in other books but, on the whole, as Sir David Brunt has written, this book covers a field not attempted in any other. It should be read by business men and members of the medical, engineering and architectural professions to learn how climatology can help them, and by meteorologists to learn how it has been found possible to use the data available to them to answer the often difficult questions posed to them by professional workers.

G. A. BULL

## INTRODUCTION TO ALTERNATING CURRENT

### School Experiments with Alternating Current

By W. E. Pearce. Pp. xii+153. (London: G. Bell and Sons, Ltd., 1951.) 8s.

THIS excellent book contains directions for more than a hundred experiments, most of which can be performed by pupils themselves using simple apparatus and working with voltages of 25 volts or less. The stimulus to publication arose from the installation of low-voltage A.C. supplies in Kent schools, followed by the decision of the London County Council to provide equipment of a similar kind for class use; the experiments themselves embody a long experience of teaching the subject, and show how much can be done by a really enthusiastic teacher convinced of the importance of giving his pupils a real understanding of the many applications of alternating current in daily life. The author, who is senior science master at Dover Grammar School, has written several other valuable books of a more formal and conventional type; the present one is unconventional in that it will give a lead to teachers looking for a method of explaining the matter thoroughly without making it all too difficult for younger pupils.

The earlier part of the book contains a number of simple qualitative experiments on the generation, heating effect and magnetic effect of alternating current, the construction of measuring instruments, and the determination of the supply frequency. The later chapters deal with the properties of A.C. circuits and devices, and here the choice of experiments is exceptionally good. No important fundamental property has been omitted. After a detailed examination of the qualitative behaviour of chokes and capacitors, reactances are measured and their variation with frequency explored. A good example of the author's method is his treatment of the series resonant circuit. The reactance of a choke is adjusted until the circuit current is a maximum; the reactances of capacitor and choke are then measured separately and shown to be nearly equal; finally, the voltages across capacitor and choke are shown to be opposite in phase to one another and many times greater than the supply voltage. All this is presented in a way that the fifteen-year-old pupil can understand, and without any mathematics.

The author is to be congratulated on a book which will serve its purpose admirably. One feels that pupils in the third or fourth year of their grammar school course will work through it with enjoyment, and understand their work as well. Teachers of physics in schools will be grateful indeed for the inspiration it contains.

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