

unfortunate that he can but look through the eyes of a male—this does not explain why Chesser's monumental work on the sexual life and behaviour of British women has apparently been completely ignored. Comfort's book deserves to be followed by one written by an equally enlightened female. Until this occurs, *Sex in Society* could be beneficial reading for all medical, social and legal students, teachers, marriage guidance counsellors, magistrates, judges, and parents.

T. H. HAWKINS

WEAK SOURCES OF IONIZING RADIATION

High Sensitivity Counting Techniques

By D. E. Watt and D. Ramsden. (International Series of Monographs on Electronics and Instrumentation, Vol. 20.) Pp. xv + 348. (London and New York: Pergamon Press, 1964.) 80s. net.

AN increase in the sensitivity of a technique of experimental physics is invariably accompanied by an extension of its range of application. One obvious example is the improvement in the sensitivity of nuclear emulsions which led to the discovery of the π -meson; other examples are to be found throughout the text of *High Sensitivity Counting Techniques*, an account of a special field of nuclear counting. The detection of nuclear radiations is, of course, a rapidly evolving subject, and this book does not attempt to give complete coverage; it is concerned with counters of single particles and with the methods of reduction of the unwanted backgrounds which beset all such instruments. Such a topic might well appear narrow and uninteresting to all but the extreme specialist, but, as the authors point out, the detection of weak activities long known to be important in chronology and in certain problems of nuclear stability has now assumed far wider significance as a result of radioactive tracer work, of the demands of the health physicist and of atmospheric contamination from nuclear explosions. It is the existence of this wider context which has encouraged the authors to place their experience at the disposal of the reader; their interest in the subject was stimulated by S. C. Curran, whose work at Glasgow and at the Atomic Weapons Research Establishment, Aldermaston, has resulted in many of the techniques described in the book.

There is, throughout this volume, an emphasis that high sensitivity in a counter is not necessarily the same as low background, but since the latter reacts favourably on the former, it turns out that most of the book is devoted to the background problem. The origins of counter background are analysed at the outset and the significance of the cosmic ray processes of neutron production and electromagnetic cascade are described. This leads on to the empirical science of shielding and much attention is rightly directed to the anti-coincidence ring of counters with which it is almost essential to surround a low-level counter. This is a recurrent theme throughout the book. There follows a section on the construction of the counter, in which selection of materials for both counter and shield is of prime importance; there is the implication that materials prepared before the age of fission may have to be reserved for the counter-maker of the future. The radiation shield may, in many cases, be elaborate and expensive and there is mention of the construction of special laboratories in which many different low-background counters may be used or tested. Such laboratories share with the anechoic chamber a somewhat eerie quality; in one the heartbeats of a visitor are heard, in the other his content of potassium-40 and caesium-137 is displayed.

The central chapters of the book deal with the detection of low levels of α - and β -activity. The former problem is simplified by the high ionizing power and short range of the particle; there are surveys of phosphors, gas-filled

counters and semi-conductor counters from a practical point of view. The chapter on carbon-14 dating deals with the most widely known of all the applications of low-level counting, and perhaps the most tangible, since the range of times involved is commensurate with recorded history. The nuclide carbon-14 is also used in many tracer investigations, but it is apparently giving way to tritium (^3H), which is detected most elegantly and efficiently in a gaseous proportional counter. This latter technique and similar techniques for low-energy β -emitters such as sulphur-35 (and also X-ray and γ -ray sources) are explored in a separate chapter. The limitation arising from the low vapour pressures of many otherwise suitable compounds is mentioned and a high-temperature counter to overcome this is described. The nuclear physicist will recognize the importance of this topic in the investigation of K to L conversion electron ratios in radiative transitions, and of electron-capture to positron ratios in β -decay.

A later chapter is devoted to the more generally applicable techniques of radioactivity; this is largely a description of different counters and of the variants of the anti-coincidence ring; it contains a useful survey of source preparation and of the corrections for scattering and absorption in activity determinations. For the detection of higher energy γ -radiation, the sodium iodide crystal is still pre-eminent, although it is being challenged by the bulk conduction counter (not mentioned in this book). The high-sensitivity aspects of this subject are illustrated by accounts of determination of the lifetime of vanadium-50 and lutetium-176; again screening is of outstanding importance. Finally, a chapter is devoted to whole-body monitoring, a subject the technology of which is rapidly developing. Since 'patient psychology' is involved, high-sensitivity counters are necessary to obtain quick results.

Messrs. Watt and Ramsden have patiently covered a wide field of enterprise. As a result, this book is heavy with factual detail; but while this makes it unsuitable for the general reader, it commends it to the user, be he physicist, biologist, or Civil Defence officer. As a volume in a monograph series, the work is suitably placed; it should be available as a hand-book in every laboratory in which precision techniques of nuclear counting are used.

W. E. BURCHAM

THE NORTH AMERICAN LANDSCAPE

Face of North America

The Natural History of a Continent. By Peter Farb. Pp. xv + 316. (London: Constable and Co., Ltd., 1963.) 45s.

THE author of this admirable book is somewhat of a Gilbert White—but his parish is a continent, and he has supplemented his own far-flung observations of its natural history by information gleaned from "those dedicated custodians of the landscape—the employees of the National Park Service, Forest Service, and National Wildlife Refuge System, and their Canadian counterparts". The result is a popular monograph in the grand manner, written with a fine command of language and a pleasing simplicity of style, which happily combines within its covers the literary requirements of a best-seller and the factual accuracy of a serious work of science. His theme is the inter-dependence of all realms of natural history—the rocks, water, soils and the plant and animal kingdoms; and he develops this topic for all the great topographical divisions of North America, from the barrens of the Canadian arctic to the swamps of the Mississippi delta, from the submergent coast-line of New England to the wave-sculptured headlands of the Pacific shores. A recurrent motif in this scenic symphony is that of evolutionary change resulting from gradual desiccation since the Great Ice Age.