statistical analysis (W. J. Dixon—it should be mentioned that the BMD programmes described here are written for the IBM 7090), and calculation of radiation dosages (T. D. Sterling and H. Perry). A group of chapters is concerned with the investigation, by calculation and simulation, of models of biological systems; mathematical aspects are discussed by G. B. Dantzig, simulation by D. Garfinkel, analogue computers by J. E. Randall, hybrid computers by W. Siler, neurotic systems by K. M. Colby, neural networks by B. G. Farley, and perceptrons by J. A. Daly, R. D. Joseph and D. M. Ramsey, and L. Uhr has a general chapter on model building. Two papers are concerned with cybernetics (F. S. Grodins) and computer-controlled experiments in psychology (G. A. Miller, A. S. Bregman and D. A. Norman). A group of chapters describes the use of computers for the processing of bio-electric signals: in neurophysiology (W. R. Adey, M. A. B. Brazier), cardiology (H. V. Pipberger), and foetal cardiology (E. H. Hon). Finally, L. B. Lusted has an excellent chapter on medical diagnosis. Many contributions are, of course, broader in scope than is indicated by the above summary.

This book is a stimulating guide to present-day American work on medical computing and the second volume will be awaited with interest. P. ARMITAGE

CHROMOSOMES OLD AND NEW

Cytology

By Prof. C. D. Darlington. Part 1: A Reprint of *Recent Advances in Cytology*, Second Edition, 1937. Part 2: Recent Advances in Cytology, 1937–1964. Pp. xvi + 768 + 16 plates. (London: J. and A. Churchill, Ltd., 1965.) 60*s*.

THE two pre-war editions of Darlington's *Recent Advances in Cytology* are undoubtedly classic texts, which were outstandingly successful in achieving what they were intended to do. This was the provision of a detailed account of chromosome form and behaviour, both normal and abnormal, in plants and in animals. They incorporated major syntheses of the literature of the field, built into a framework of interpretations and ideas developed by the author. They combined, in Prof. Darlington's unique style of writing, information with interest, wit with wisdom. The essential uniformity of the chromosome mechanism in both plant and animal kingdoms was emphasized throughout and an eye was always kept on the genetic roles of the chromosomes. The chromosomes contained the genes, indeed they were the genes, and were in turn subject "*as individuals to the laws they enact as a body*".

It is a measure of the stature of *Recent Advances*, and the value of the author's approach, that, despite its second edition being almost thirty years old—a great age for a book in a subject advancing as rapidly as cytology—it is a volume which must still be consulted by a practising cytologist as an authoritative basis for chromosome study. This continued demand has now been met, under the abridged title of *Cytology*, with a reprint of the second edition, originally published in 1937, supplemented by an appendix in which Prof. Darlington provides an assessment of the advances which have taken place in the field between 1937 and 1964. This very much shorter second section is not meant to have the detail and approach of the first section. Rather, it is a guide to those developments during the past twenty-seven years which have been of particular interest to the author himself and which support, qualify or, occasionally, disprove information or predictions outlined in the first section of the book. This personal approach lends coherence to the two sections and yields a result which is in many ways preferable to an attempt to combine the two in an entirely re-written edition. For this is not really a book for the beginner in cytology: the treatment of some topics is too detailed for this purpose and a number of introductory books, including some by the author himself, are more appropriate for this purpose. No, this is a book for the more serious student of chromosome cytology, who will be able to trace within its pages the development both of this important branch of biology and of this important biologist. I feel sure that all who fall within this category, including many who already possess one of the earlier editions, will wish to avail themselves of this new opportunity to survey the field from so respected a point of view.

S. A. HENDERSON

METEOROLOGY IN THE TROPICAL PACIFIC

Cloud Structure and Distributions over the Tropical Pacific Ocean

By J. S. Malkus and H. Riehl. Pp. ix + 229. (Berkeley and Los Angeles: University of California Press; London: Cambridge University Press, 1964.) 60*s*.

THE wide expanse of the central Pacific is a fruitful region for research in tropical meteorology, unhindered by the often overpowering effect of local orographic features. The two authors are well known for their published papers on the trade-wind regions. Whether they were wise to attempt a more detailed presentation in book form is questionable. For *Cloud Structure and Distributions over the Tropical Pacific Ocean* is simply a detailed account of observations made on three flights in 1957; it has taken much longer to appear, and will, one suspects, attract fewer readers than would a briefer account in a scientific journal. The flights were made at low level in a single aircraft, and observations were accordingly limited. Synoptic scale analyses must be considered subjective, and it is the meso-scale features that carry most interest.

The three tracks chosen were in a generally east–west direction just inside the Tropics; a north–south direction across the equator would have yielded results even more intriguing and difficult to interpret. However, the situations described are full of interesting detail. For example, the familiar 'lean' of trade-wind cumuli was found to be indicative of weak convection at the shear level; a change to more intense convection occurred due to the building of 1 in 4 of the cumulus lines at the expense of others; the cloud streets were at times related to the upper shear rather than the low-level wind, indicating that cloud observations from satellites should not be used in wind analyses.

On the larger scale, a remarkable feature of tropical Pacific meteorology is the high variability of flow pattern above the settled trade-wind flow. Data presented here seem inadequate for the theories advanced—Doppler winds from high-level aircraft were needed to supplement the scattered radar-wind reports. Nevertheless, the authors present a good case for relating the 250–150 mbar thickness tendency to large-scale development. I have noted that, on occasion, disturbances at 200 mbar are accompanied by unsettled weather, but more frequently there appears to be little association. More investigations of wind in the upper troposphere are needed in these regions.

All the data are well presented with full documentation of observations, including cloud photographs, together with appropriate synoptic charts and radio-sonde reports. It is a relief to find that the stream-lines illustrated do not reproduce the rather fanciful patterns to be found in other studies of tropical meteorology. After reading of these three flights one realizes the wealth of meteorological knowledge which must be acquired by airline pilots and which so rarely seems to be channelled through to the meteorologist.

P. GRAYSTONE