

Star Spectra

Spectroscopic Astrophysics. Edited by G. H. Herbig. Pp. ix+462. (University of California: Berkeley, Los Angeles and London, 1970.)

MEMORIALS to outstanding scientists can take different forms, one of the more familiar being those volumes written by former pupils which stress the great advances which have been made in fields opened up originally by the scientist to be remembered. Science moves so fast at present that it is rarely worth reprinting in their original form publications of earlier years, even those of pioneers. That it was possible, as has been done in the present memorial volume, to reprint with few omissions a number of papers originally published some thirty or more years ago testifies to the greatness of the man remembered, Otto Struve, who died in 1963. There are indeed few fields in astronomical spectroscopy which have not been fundamentally advanced if not actually inaugurated in one or the other of Struve's large number of publications.

Out of well over four hundred research papers, ten particularly striking samples, all very familiar to the older generation of astronomers, have been selected by J. L. Greenstein, G. H. Herbig and W. A. Hiltner, who had been charged by the American Astronomical Society with the task to prepare a fitting memorial to Otto Struve. The oldest of the reprinted papers, on the Stark effect in stellar spectra, dates back to 1929, and I vividly remember the impression which that paper created when Struve discussed it at the time before the members of the well known Physics Seminar of Berlin University.

G. H. Herbig, the editor of this remarkable volume, has let each of these Struve papers be followed by an expert's commentary which gives a present day view of developments in all those fields with which Struve's papers are concerned. The twelve authors of these commentaries, all former colleagues or associates of Otto Struve, are themselves sufficiently distinguished to make their essays on their own account amply merit publication. Struve's paper, published in 1933, on the problem of spectral classification is thus followed by a commentary by W. W. Morgan. Struve and Elvey's well known early paper on the curve of growth is succeeded by Greenstein's discussion of the method as it has been used in the thirty years since 1934. Struve's 1929 investigation of the Stark effect in stellar spectra is followed by a detailed discussion of the effect of Stark broadening on Balmer lines, given by E. Böhm-Vitense. Three papers which Struve wrote together with Wurm, Swings or Rudkjøbing on stellar envelopes, peculiar objects such as Z Andromedae and

the T Tauri stars have found detailed commentaries by Underhill, Swings and Herbig. Another well known paper by Struve on the composition of the interstellar medium is brought up to date by Münch and van de Hulst. In the early nineteen fifties Struve had taken a keen interest in the Beta Canis Majoris stars, and his paper is here discussed by van Hoof. A long commentary is devoted by Kraft to the problem of stellar rotation; this follows Struve's famous 1930 paper on the effect of rapid axial rotation on line profiles. The final paper in this volume deals very appropriately with spectroscopic binaries which were Struve's earliest interest and which remained of particular concern to him through all his life. The commentary in this case is by D. M. Popper.

In length, the commentaries vary from two to nearly forty pages. Herbig as editor has refrained from forcing contributors to stick to the same length or even the same pattern in their commentaries. In this way he has produced a lively and eminently readable book which conveys in a unique way an excellent picture of a remarkable man who achieved what he did because, obviously, nothing mattered to him but astronomy. Apart from its importance to anyone concerned with astrophysical spectroscopy the book will give great pleasure to the many who came to know and admire Otto Struve and his work.

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Test for Contamination

Environmental Surveillance in the Vicinity of Nuclear Facilities. Edited by William C. Reinig. (Proceedings of a Symposium sponsored by the Health Physics Society.) Pp. xvi+465. (Thomas: Springfield, Illinois, July 1970.) \$29.

THE contents of this book are very relevant to the efforts now being made to prevent deterioration in the environment and hazard to man as a result of current technological development. The book contains an interesting collection of papers presented at a symposium of the Health Physics Society in the United States in January 1968. The claims in the preface that the book presents an international viewpoint are sustained by the participation of 15 authors from seven countries, not counting the considerable number from America. The 46 papers are divided amongst five topics. The first of these concerns the objectives of environmental surveillance, and three papers are presented by authors from Britain, America, and Canada respectively. This section is based substantially on the recommendations of the International Commission on Radiological Protection, contained in its Publication Seven on *Principles*

of Environmental Monitoring. Emphasis is placed on the need to monitor materials which have close proximity to man, and for clear scientific objectives.

A substantial section of the book is concerned with the design and methods of environmental surveillance in normal operations and in emergency situations. The protection of man from exposure to ionizing radiation is, of course, the primary objective, and in one section of the book seven papers are presented on the dose to populations determined from actual experience in the operation of nuclear facilities. The actual doses received by people in the instances given are relatively very small and, even on pessimistic assumptions of the risks from ionizing radiation, the consequences to the populations involved would be negligible.

One interesting paper in this section reviews the recommendations of four international agencies: the International Commission on Radiological Protection (ICRP), the International Atomic Energy Agency (IAEA), the Food and Agriculture Organization of the United Nations (FAO), and the World Health Organization (WHO). While the ICRP contribution provides the fundamental principles and information on the significance of radiation exposure, a joint paper from the three other agencies is the best reference for radiochemical methods and evaluation and the use of instruments. Both the IAEA and the WHO underline the importance of scientists planning the surveys, and the WHO emphasize the importance of cooperation between operator and the health authority in ensuring a satisfactory environment.

Perhaps the most interesting part of the book is the fifth section, concerned with research in support of environmental surveillance. Some of the papers in this section present data derived from the escape of fission products in experiments with nuclear rockets, but most of the data relate to experience in the development of nuclear power, including the behaviour of radiostromium in streams, of tritium in air and soil, and of radioiodine on pastures and in milk. Other papers deal with the calculation of doses to various organs from inhaled fission products and with the calculation of doses from gamma spectrometer measurements in environmental surveys.

This book demonstrates the wide extent of the knowledge and experience available regarding the behaviour of radioactivity in the environment and the passage through food chains to man. While much of the information will be well known to the professional health physicist, the book may reassure the layman about the protection of human beings in the vicinity of nuclear facilities.

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