and whys." Here, with many easily understood diagrams, he explains the circles of the celestial sphere and the seasonal changes of the constellations, as well as the ecliptic and how to find the planets. There are also brief descriptions of the moon and planets, of the nature of stars and the galaxy. A table for locating the planets and a brief "index-glossary" complete this excellent introduction to the sky.

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Engineering Data

Elements of Infrared Technology. Generation, transmission, and detection. Paul W. Kruse, Laurence D. McGlauchlin, and Richmond B. McQuistan. Wiley, New York, 1962. xxi + 448 pp. Illus. $10.75.

This book, with a title descriptive of its content, provides a useful discussion for college seniors or first year graduate students whose interest is primarily academic and for engineers and scientists engaged in research on infrared devices.

Mainly because of its military applications, infrared technology has developed into a complex of many arts and sciences and, within the last two decades, has produced extremely sophisticated systems. The purpose of this volume is to explain the principles, operation, and limitations of the elemental components in infrared systems. A subsequent volume will cover systems and applications.

In the preparation of such a work, a major problem arises from the broad scientific scope underlying infrared technology. The authors' solution comprises careful organization and judicious editing. This is primarily an engineering book; it is an excellent compilation of engineering data. Much information is presented in graphic or in tabular form.

Most sources of infrared radiation are mentioned in the discussion of its generation, but thermal sources are covered in more detail than other methods. This seems justified because of their importance as practical thermal sources. A subject often neglected, photon fluctuation phenomena, is discussed in this section. The treatment of lasers and irasers is disappointingly short, considering their potential as coherent infrared sources. However, an excellent coverage of their use as detectors is given in another section.

The discussion of transmission follows the general pattern: a competent treatment of classical theory and its application to optical elements, then a summary of the optical properties of various media. The presentation of optical data is convenient and quite complete. For the more important materials, the coverage also includes pertinent mechanical properties, types of usable seals, and chemical stability. A discussion of the optical properties of the atmosphere completes the section.

The third subject, detection, which occupies about half the book, begins with a short introduction to solid state physics and noise theory. The authors then develop a complete quantitative engineering analysis of photoconductive, photoelectromagnetic, photovoltaic, and bolometer detectors; in this process they manage to discuss qualitatively the operating principles of all elemental detectors. They conclude with a comparison of various elemental detectors.

The Elements of Infrared Technology presents a great amount of information in a concise, clear fashion. The discussion of noise and its application to the analysis of elemental detectors will be useful to any experimentalist making low level measurements.

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Hazards of Nuclear Energy

Diagnosis and Treatment of Acute Radiation Injury. Proceedings of a scientific meeting, jointly sponsored by the International Atomic Energy Agency and the World Health Organization, Geneva, 17–21 October 1960. Columbia University Press, New York, 1961, 425 pp. Illus. $8.

The publication of these proceedings represents an important event in our attempts to evaluate and deal with accidental serious exposures to external ionizing radiations. Practically all of the material in the first ten papers is concerned with six accidents that have taken place since the end of World War II. Excluding the experience of the U.S.S.R., the exposure to fallout of the Marshallese, and the two more recent criticality incidents (in Nevada and at Hanford, Washington), these six incidents comprise most of the data on which our knowledge of accidental external exposure is based.

The "Lockport incident," which was discussed at the symposium, differs from the others in that the exposures were produced by x-radiation from an unshielded klystron tube in a radar station. The other five incidents all involved accidental criticality reactions, in experimental nuclear reactors in the case of the two old accidents at Los Alamos and also in the more recent one at Vinča, and in salvage operations involving uranium or plutonium, in the case of both the Y-12 accident and the recent one at Los Alamos.

One of the major contributions of this scientific meeting was to bring together the physicians, the physicists, and the radiobiologists who had to cope with the medical care of the exposed individuals. The papers and discussions brought out the very difficult problem of evaluating the degree of injury immediately after an accident in which there were mixed sources of irradiation and of recognizing unique regional injury, such as the heart damage experienced by the chemical operator in the most recent salvage accident (involving plutonium) at Los Alamos. Treatment was also extensively dealt with at the symposium; this ranged from allowing the patients to recover spontaneously, without therapy, to massive supportive measures and bone marrow transplantation.

Diagnosis and treatment of radiation injury were further considered in the next group of five papers, which were concerned with whole-body radiation therapy used to treat leukemia and other cancers and to suppress kidney homograft rejection. Procurement and preservation of human fetal blood-forming tissues, as well as adult bone marrow, were also discussed in detail.

The remaining six papers and discussion emphasized the special problems concerned with bone marrow transplantation. Human autologous marrow transplants have been used as an adjunctive measure to promote recovery from large port radiotherapy for advanced cancer. Particular attention was devoted to autologous and foreign marrow transplants in rabbits and monkeys, and this brought out the well-known problem of secondary disease in irradiated subjects treated with foreign bone marrow. Chemical protection against