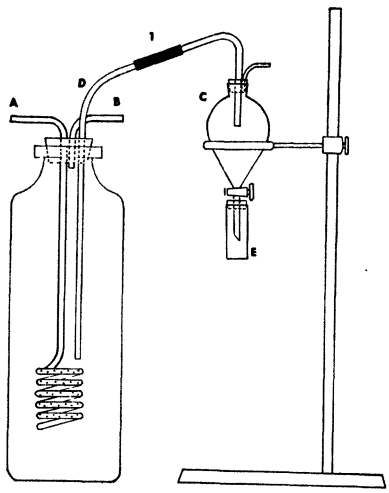

FIG. 1.

escapes at *B*. In operation, a screw clamp is placed at 1 to prevent passage of medium through tube *D*. In order to remove a sample, all that is necessary is to release the screw clamp at 1 and close the opening at *B* with the finger. The pressure created in the bottle will force culture medium through tube *D* into the separatory funnel *C*. When a large enough sample is collected in *C*, the finger is removed to release the pressure in the bottle. The sample may then be drawn off by placing a sterile test tube at *E*.

The aerator may be modified in size and shape to suit the investigator. This illustration merely indicates one type that may be used.

The entire apparatus is easily sterilized. The bottle with culture medium is plugged with cotton and autoclaved. The remainder of the apparatus is wrapped in paper and also autoclaved. When ready to use, the cotton stopper is removed from the bottle, the opening sterilized in the flame of a Bunsen burner, and the rubber stopper carrying the various tubes inserted firmly in place.

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Book Reviews

Industrial Medicine on the Plutonium Project. Survey and Collected Papers. Robert S. Stone, Ed. New York–London: McGraw-Hill, 1951. 511 pp. $6.25.

This recent addition to the "National Nuclear Energy Series" summarizes the evolution and development of the health programs for personnel associated with the three main units of the Plutonium Project—namely, the Metallurgical laboratory at Chicago, the Clinton laboratories at Oak Ridge, Tenn., and the Hanford Engineer Works at Hanford, Wash.

The first 285 pages constitute a survey section, which is preceded by an uncommonly interesting introduction. The ten chapters of this section include a description of the medical services of the Plutonium Project, a survey of past and present bases for maximal permissible exposure, and an account of the development and application of various chemical, physical, and hematological methods of monitoring on an individual basis for overexposure to the various harmful agents with which Plutonium Project workers might come in contact. Two chapters are devoted to an evaluation of certain biochemical studies (such as the excretion of chromogens, liver function tests, and the excretion of uranium) relative to their reliability as indicators of harmful overexposure.

The remainder of the book consists of collected papers that discuss, in more or less detail, studies relative to one or more of the chapters in the first section. In many instances the material in the "Papers" section actually forms the basis for the chapters in the first section. Because of this relationship there is considerable repetition throughout the book. Much of this is pardonable in light of the formidable problem inherent in editing the series, for in many instances the papers represent work done several years before publication by investigators who are no longer available to revise or edit their own papers. A few repetitions, however, where whole sentences or paragraphs are repeated (for example, sec. 9.3, chap. 4; sec. 3.3, chap. 5; sec. 9, chap. 4; and the last few sentences in chap. 5) are particularly distracting.

There is one unfortunate omission from the book —namely, the absence of any mention of the currently accepted tolerance dose of 0.3 r per week or equivalent for whole-body exposure to ionizing radiation. The various discussions are based on the older tolerance dose of 0.1 r per day, a value that was generally accepted at the time most of the chapters were written. A footnote or foreword would have been helpful.

The book is primarily of interest as a reference book for persons working in the field of industrial medicine or health physics and, as such, contains much material not otherwise readily available. In particular, it is a useful and readable source of information for the practical philosophy of health protection in radiation work. As a record of a contemporary adventure in preventive medicine the book is a tribute to the many medical and nonmedical per-

sonnel whose efforts made the Plutonium Project health program so eminently successful.

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Reports on Progress in Physics, Vol. XIV. A. C. Stickland, Ed. London: The Physical Society, 1951. 412 pp. £2 10s.

This volume continues the tradition established by earlier volumes of the series. It consists of 11 review articles on widely differing areas of current interest to physicists, 7 by British and 4 by American authors.

"Recent Advances in Ultra-Violet Absorption Spectroscopy," by W. C. Price (18 pp.), describes recent progress in the design and construction of photoelectric spectrophotometers. Most of the emphasis is on experimental techniques, such as cathode-ray presentation, color translation, high-intensity sources, and photographic emulsions, although there is also a brief review of interpretative work. "Anomalous Fine Structure of Hydrogen and Singly Ionized Helium," by W. E. Lamb, Jr. (45 pp.), starts with a thorough account of the experimental and theoretical history of the structure of the Hα line. The application of radiofrequency spectroscopy to the resolution of the problem by the author and his collaborators is described in considerable detail, and recent experimental and theoretical values for what is now universally known as the "Lamb shift" are quoted. An impressive feature of this work is the relatively large number of experimental techniques that had to be developed or improved, and the analysis that went into the consideration of each. "New Techniques in Optical Interferometry," by H. Kuhn (31 pp.), discusses recent work on the properties of optical surfaces and thin films, interference optics and spectroscopy, and testing methods. Several combinations of dielectric and metallic films are discussed, and a wide variety of applications, to such subjects as solar interferometry and interference microscopes, is briefly reviewed. "The Diffraction Theory of Aberrations," by E. Wolf (26 pp.), starts with a critical historical survey of investigations concerning optical image formation when aberrations are taken into account. Theoretical researches of the past decade, based mainly on expansions for cases where the wave deformation is a small fraction of a wavelength, are given particular emphasis, and several beautiful photographs are exhibited for comparison with the calculated aberration patterns. "The Spectrum of the Airglow and the Aurora," by A. B. Meinel (26 pp.), reviews recent progress in the observation of the night and twilight airglows, and of the aurora. The correlation of observed spectra with theoretical and laboratory results is discussed, and a few discrepancies are noted. Several problems of interest for future investigation, and the possibility of new experimental approaches, such as the use of microwaves and rockets, are mentioned.

"The Microphysics of Clouds," by B. J. Mason and F. H. Ludlam (49 pp.), deals mainly with the growth of water droplets and ice crystals induced by various kinds of nuclei. The authors point out the difficulty of simulating natural meteorological conditions in the laboratory, and the necessity for combining model, theoretical, and field studies of these phenomena. Several interesting photographs of ice and snow crystals are included. "Angular Correlations in Nuclear Reactions," by M. Deutsch (31 pp.), reviews work, mainly of the last 5 to 8 years, and the application of conservation laws to the relative angular distributions of successive nuclear reactions. The emphasis is placed on experimental techniques; the great complexity of the theoretical formulas precludes explicit mention of the theory in all but a few very simple cases. "The Nuclear Interactions of Cosmic Rays," by G. D. Rochester and W. G. V. Rosser (61 pp.), is an extensive review of all established types of nuclear effects produced by cosmic rays. These include evaporation stars, penetrating showers, the nuclear interactions of heavy nuclei, electron-photon mixtures, and mesons, and the transition effects of various combinations of these. In some cases, the various experimental techniques employed are illustrated by photographs. "Nuclear Effects in Atomic Spectra," by E. W. Foster (28 pp.), discusses mainly the results of optical investigations of hyperfine structure. The effects of nuclear mass and volume on the relative term values of different isotopes of the same element are presented from both theoretical and experimental points of view. The hyperfine structure caused by nuclear magnetic dipole and electric quadrupole moments is also considered, and the effect of the finite spatial extent of these moments is briefly discussed. "A Critical Survey of Ionospheric Temperatures," by N. C. Gerson (50 pp.), reviews temperature measurements by several different methods in the altitude range 100–400 kilometers. Quite good agreement is found, indicating the likelihood that thermal equilibrium and a Maxwell distribution of all atmospheric particles exist. Several directions for future research are indicated. "Some Applications of Nuclear Physics in Medicine," by W. V. Mayneord (47 pp.), summarizes the medical applications of radioactive isotopes produced by piles and cyclotrons, and also the therapeutic uses of fast electrons and gamma rays. Both radioactive sources and artificial accelerators are dealt with. Brief mention is made of high-speed neutrons, and there is a more extended discussion of high-energy x-rays. A concluding section emphasizes the vital importance of protection, and points out the difficulties attendant upon the establishment of "safe" dose levels.

The bibliographies appear to provide extensive and representative coverage of the literature. The publishers are to be congratulated on the appearance of the book, as regards typography of text and equations, line cuts, and plates.

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