two from Guatemala and three from Mexico. Eight of these nine were selected for fellowship awards of the American Foundation for Tropical Medicine following careful scrutiny of a large group of endorsed applications. Some of the North American physicians in attendance plan to practice in missionary stations in Africa, India and the Netherlands East Indies; others expect to specialize in tropical medicine in the United States or with the defense forces.

The course is carefully integrated and consists of lectures, conferences, quizzes, laboratory, clinic and hospital practice covering the fields of hematology (16 hours), protozoology (40 hours), helminthology (40 hours), medical entomology (40 hours), tropical bacteriology (48 hours), mycology (32 hours), tropical pathology (24 hours), tropical surgery (12 hours), deficiency diseases (24 hours), preventive medicine and public health (24 hours). Approximately 120 of the total of 412 scheduled hours consist of work with patients in the wards of Charity Hospital in New Orleans.

This course is in charge of eight full-time staff members of the Tulane Department of Tropical Medicine, supplemented by time contributed by members of the departments of medicine, surgery, pathology and preventive medicine and public health of Tulane University, as well as of the Louisiana State Department of Health and U. S. Quarantine Service in New Orleans. In addition, the following guest lecturers, specialists in their subjects, have contributed to the success of the course:

Dr. Clarence A. Mills, professor of experimental medicine, University of Cincinnati, "Tropical Climatology" (October 8–10).

Dr. George W. McCoy, director, department of public health, Louisiana State University Medical School, "Plague and Tularemia" (October 29–30).

Dr. Herbert C. Clark, director, Gorgas Memorial Laboratory, Panama, "Malaria" (November 17–18).

Dr. G. H. Faget, senior surgeon, medical officer in charge, U. S. Marine Hospital, Carville, La., "Leprosy" (November 18–19).

Dr. C. G. Eccles, pathologist, U. S. Marine Hospital, Carville, La., "Pathology of Leprosy" (December 2).

Dr. A. W. Sellards, associate professor of comparative pathology and tropical medicine, Harvard Medical School, "Yellow Fever and Dengue" (November 24–25).

Dr. Rolla E. Dyer, director, division of infectious diseases, National Institute of Health, Bethesda, Md., "Typhus and Tick Fevers" (November 27–28).

Dr. E. B. Vedder, Colonel, M. C., U. S. A. (retired), professor of experimental medicine, the George Washington University, Washington, D. C., "The Deficiency Diseases," "Cholera" (December 8–13).

Dr. E. R. Kellersberger, general secretary, American Mission to Lepers, for twenty-four years missionary physician in the Belgian Congo, "Medical and Human Aspects of African Trypanosomiasis and Leprosy" (December 12).

No academic degree is awarded but a certificate is given to enrollees after successful completion of this work.

With the full endorsement and whole-hearted support of the American Society of Tropical Medicine, the American Academy of Tropical Medicine and other interested groups, it is expected that this course in tropical medicine at Tulane University will become a permanent contribution to American medical education.

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SCIENTIFIC BOOKS

GASES

The Separation of Gases. By M. RUHEMANN. Oxford University Press, xiii and 279 pages. 1940. $5.75.

THE importance of natural gases and all the primary gaseous products of industrial processes and the necessity of some degree of gas separation and purification in order that these gases may be used more economically is too well known and appreciated to need comment. The technique and theory of the process of separation of gaseous mixtures, mainly by liquefaction at low temperatures, has developed rapidly in recent years and in other countries—notably Russia—the knowledge and experience acquired by workers in the field have gone far toward establishing low-temperature gas separation as a field of applied science. Moreover, it is claimed that in the near future all gases used in bulk commercially will probably first be separated, at least partially, into a number of constituents, with a great gain in efficiency. Nevertheless, it is the author's contention that this "deep refrigeration," as it is called, has not received the attention it deserves from physicists, chemists and engineers in this country. It is with the intention of stimulating investigation in this field, and making the information already acquired available in English, that this book was written. While, according to the author's preface, the book is designed, in large degree, for those who may be instrumental in training future workers, it is the reviewer's opinion that the subject matter will appeal mostly to those already engaged as scientists or engineers in industrial laboratories where gas products are an important consideration. However, it must be stated that there is

a great deal which is useful for the production of such low temperatures as may be attained by mechanical means and the book is therefore of interest for research of a more academic nature.

Since the value of a book dealing with a rather specialized subject depends so greatly on the detailed nature of the information presented, the following brief description of contents is given. After a short introduction dealing with general principles involved in gas separation the author reviews in Chapter I the gas mixtures of greatest importance from the industrial point of view. As a preparation for the problems involved in the separation and therefore of primary importance for the design of the separating plant, the equilibrium of vapor-liquid systems (binary and ternary) is treated in Chapter II. While the discussion is presented in an entirely adequate manner some readers will no doubt find it necessary to consult more detailed texts. For instance, although frequent use is made of the phase rule no explicit statement of it is made. This chapter also contains useful equilibrium diagrams for a number of gas mixtures (pp. 44–59). The methods of gas separation and a discussion of the pertinent thermodynamical principles are presented in Chapters III and IV, and in Chapter V refrigeration as applied to gas liquefaction is treated in detail. The remainder of the book is concerned with the separation of special gas mixtures the most important of which is air. Chapters VI to IX are devoted to a discussion of the types of separation plants, the efficiency of various separation methods and the effect of the non-binary character of air, with especial reference to the extraction of rare gases from the atmosphere. The final chapters, X to XII, deal with coke-oven gas, the production of methane and helium and the separation of olefines from cracker gas.

In summary the reviewer feels that this book should be very useful in its field of application and would be more so if greater emphasis had been placed on experimental data.

ATOMS

The World and the Atoms. By C. MOLLER and E. RASMUSSEN, with a foreword by NIELS BOHR. Translated from the second Danish Edition. 193 pages and 40 figures. D. Van Nostrand Company, 1940. $2.75.

THAT "The World and the Atoms" gives to its readers an admirable account of the fascinating discoveries of modern physics and of the important basic concepts to which they have led is in itself a sufficient recommendation of this most enjoyable book. It is perhaps equally noteworthy that the complementary nature of theory and experiment, so essential for the progress of physical science, is more than adequately expressed. The development of atomic physics starting from the discovery of radium and culminating in the contemporary researches into the atomic nucleus is traced in a very logical and understandable manner—with no mathematics more complicated than multiplication. It is unfortunate that the date of writing prevented more than a brief mention of cosmic radiation.

While no serious fault is to be found with the translator's version the substitution of *brass* for *messing* (facing page 78), *sodium* for *natrium* (Fig. 14) and *tungsten* for *wolfram* (Fig. 21) would have been preferable. Fig. 27 contains a misprint in that the last element of the radioactive chain pictured should be an isotope of *lead* and is therefore *stable* rather than *stabbe*.

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SPECIAL ARTICLES

THE PROTECTION OF MICE AGAINST INFECTION WITH AIR-BORNE INFLUENZA VIRUS BY MEANS OF PROPYLENE GLYCOL VAPOR

SINCE our earlier report on the germicidal action of certain glycols dispersed as fine droplets (aerosols),[1] we have found that the vapors of these compounds exert a rapid and highly bactericidal effect on air-suspended bacteria.[2] Our studies show that the lethal action of glycol aerosols is due principally to the liberation of gas by rapid evaporation of the aerosol droplets. When employed in the gaseous form the amounts of glycol required for effective air sterilization are much smaller than when the substance is introduced as an aerosol. Continued accumulation of evidence indicates that propylene glycol is the agent of choice for this method of killing air-borne bacteria because of its high bactericidal activity and low toxicity for the body as compared with other glycols.

In order to test the action of propylene glycol vapor on influenza virus it was first necessary to devise a simple and effective means of recovering this virus

[1] O. H. Robertson, E. Bigg, B. F. Miller and Z. Baker, SCIENCE, 93: 213, 1941.

[2] O. H. Robertson, E. Bigg, B. F. Miller, Z. Baker and T. T. Puck, *Transactions of Assoc. of Amer. Physicians.* In press.