

The Nuclear Age

Continued from page 20

of our own ignorance. Indifference, confusion, panic are the monstrous offspring of ignorance, with us condoned by our superstitions about secrecy.

We have not yet faced the meaning of our own military inventions. And in this general fact Dr. Lapp has played an ambivalent role: no question but that his writings and lectures have been an important source of lay knowledge on atomic energy; no question too but that his earlier work, when he was part of the official team, was devoted to playing down the atomic bomb. His first book "Must We Hide?," written when he was an organization man in the Office of Naval Research, was of the don't-worry-about-atomic-bombs-boys-they're-dangerous-but-so-are-automobiles-tobacco-and-alcohol kind.

Perhaps it was the hydrogen. Perhaps cobalt, or strontium 90, or ICBMs, or that tiny bit of matter, incredibly radioactive three years after, which mattered so much. More likely, though, it is because Dr. Lapp is a free man now, well informed and free to think and speak.

Years ago the author of the first book of the Bible posed the simple question: "Am I my brother's keeper?," to which mankind has never been able to give a simple answer. Yet a kind of answer can now be given; modern nuclear weapons have forced one kind of answer upon us. It is: "Be assured, whatever else you think, from now on thy brother is thy keeper."

ATOMS FOR PEACE: In the almost incredibly quickening pace of scientific development, and of practical application of the results of basic research, it has not been easy for the nontechnically-trained reader to find an authoritative, objective, and yet highly readable account of developments in nuclear energy, the new field of surpassing importance that will revolutionize life on this planet, if it does not end it. The author of "On Nuclear Energy," Dr. Donald J. Hughes (Harvard University Press, \$4.75), has therefore performed a notable service in writing just such a book. Dr. Hughes is not only a top-level research physicist at the Brookhaven National Laboratory; he has also been

considerably involved in activities concerned with increasing the broad public understanding in the area where science and public affairs overlap. He has moreover had extensive contacts with physicists from Russia and vicinity, both at the 1955 "Atoms-for-Peace" conference at Geneva and on the occasion of a month-long visit to Russia and Poland last year.

His book contains an excellent account, in some 160 pages, of such matters as basic principles and current uses of nuclear energy. The remaining ninety pages—three chapters—are devoted to matters of perhaps even greater current interest and importance—"The International Atom," "Safety, Security, and the AEC," and "Fusion." No starry-eyed idealist, Dr. Hughes. He writes clearly of the discouraging Soviet position in the early stages of planning for the 1955 Geneva conference, a position which "threatened to bring the conference to a standstill when it had hardly started moving." The continuing account, in similar quiet tones, then describes the pleasure with which Western scientists subsequently learned that the Soviet papers prepared for and presented at the conference contained none of the propaganda matter that had appeared in the early planning meeting, but "good, solid, technical material, with no boasting or political overtones." This part of the book is especially interesting to read, with its account from a working scientist of the contacts made at Geneva, and subsequently expanded, which supply a "basis for cautious optimism concerning the continuation of beneficial East-West communication in science." International cooperation in the peaceful use of atomic energy, led by the United States with President Eisenhower's UN speech of 1953, and by the Soviet Union with its action making it, in February, 1957, the first nation to ratify the statute of the International Atomic Energy Agency, represents probably the most promising development so far in the attempts of the world's peoples to work towards world peacefulness, in this new era in which one small human failing or accident could bring annihilation.

Henry A. Dunlap, public affairs officer of the U.S. Embassy in Ghana, and Hans N. Tuch, policy officer for the Voice of America in Munich, have written, in "Atoms at Your Service" (Harper, \$3.50), a very brief book evidently intended not so much for the reader who wishes to inform himself to the end that he may more intelligently participate in the discussion and formation of public policy, but rather for the reader who merely

wishes to become "well-informed." The part of the book concerned with the principles and uses of nuclear energy is passable, although a few seriously misleading or incorrect statements occur: e.g., the description of the way in which a nuclear reactor's power level is controlled by control rods seems very likely to give one the erroneous impression that the stable control of power level is an exceedingly delicate matter, perhaps almost unsafe. Twenty-five pages of the book are devoted to broader topics, along lines indicated by the following extract from the preface: "The United States deals with atomic energy on an international as well as a national scale, so we must know about our country's attitude on the political as well as scientific front."

—W. SELOVE.

TOWARD A BRIGHTER WORLD: K. E. Halnan's book, "Atomic Energy in Medicine" (Philosophical Library, \$6), is a good antidote for anyone surfeited with American chauvinism (in the pithy-word-and-picture press) regarding our contributions to radiation medicine. Concerned largely with British work, it makes only limited reference to American efforts and even less to that in other countries. Apart from some minor scientific howlers in the first two chapters, in which the author endeavors in few words to give the reader some special background in atomic structure and physics, the book is well and expertly written: it abounds in a sense of excitement.

Descriptions of the use of radioisotopes in studies of mechanism of penicillin action, of the nature of gout, and of the spread of infectious diseases are a prelude to excellent summaries of radiation biology, of the action of radiation on single cells and higher organisms of increasing complexity, and of the treatment of cancer and related diseases, of thyroid malfunction and of various blood diseases. The statement "No type, site, or class of cancer is completely incurable" is written with a sense of authority and supported by statistical evidence.

The book also reviews briefly the use of radiation or radioactive isotopes in a variety of diagnostic techniques, in monitoring plastic surgery and in studies of nerve action. Different types of electron accelerators and radioactive sources have special applications, all of which the author presents clearly and informatively in spite of the complexity of his subject.

Dr. Halnan concludes his survey with some cautionary comments on the dangers of high-energy radiation and with some interesting statistics

LITERARY I.Q. ANSWERS

Column Two should read: 2, 17, 18, 16, 19, 7, 4, 6, 11, 10, 9, 5, 12, 1, 8, 14, 15, 20, 3 or 13, 13 or 3.

on the radiation exposure of various classes of people at various times. Modern technology increases the hazard somewhat before research recognizes it. He states a maximum permissible dose three times that of the value officially adopted in the last few months. The final words are optimistic: the balance sheet shows that the development of atomic energy has already done more good in industry and agriculture than it has done in the pursuits of war. Dr. Halnan has shown brilliantly its value in medicine, in results already accomplished and in the bright world to come.

—MILTON BURTON.

FUTURE OF PLANT LIFE: Though presumably intended for an essentially British audience, "Atomic Energy in Agriculture," by William E. Dick (Philosophical Library, \$6), will prove intriguing in any land to the expert in some phase of atomic energy, to his wife and children, and to the curious reader. It is a pleasure to relate that the author does not burden the first chapters with the history of atomic energy or with partially popularized, weakly theoretical comments on atomic structure, radioisotopes, and ionizing radiation. Instead, at each step he discusses some aspect of an interesting field and presents just sufficient background to make the exposition intelligible, as well as exciting, to the nonexpert.

Mr. Dick's very conservative opinion on the dangers of high-energy radiation is expressed in a quotation from the geneticist and Nobel Laureate, Professor H. J. Muller, that possibly all mutations produced by X-rays will eventually turn up in nature, but that they are likely to turn up somewhat sooner if X-rays are used. He then proceeds to show how deliberately induced mutations are being combined with standard genetic techniques in the remaking of such important plant crops as barley, lupin, beans, peas, apples, pears, corn, peanuts, and forest trees and also in the recoloring of flowers. The next chapters show how radioisotopes are used in research; the author presents an excellent brief historical review of the progress in photosynthesis research and follows it up with a historical summary of the development of tracer chemistry with particular application to studies of growing plants.

An impressive portion of the book is given over to a description of the use of radioactive materials in the fight against pests and of the importance of that fight; "in Britain, field agricultural losses meant that in 1947 the labor of over 50,000 skilled farm workers, out of a total labor force of around 800,000, was com-

pletely wasted." The chapter on forestry is quite intriguing, that on food preservation by radiation sterilization, scholarly, stimulating, and yet conservative. Finally, the author discusses the genetic problems confronting the radiation biologist. Caution is clearly indicated, both by the volume and by more recent events. The agreed, conservative, tolerance dose of X-radiation mentioned by the author has been officially reduced by two-thirds since this study.—M. B.

IN THE VANGUARD: "Economics of Atomic Energy," by Mary S. Goldring (Philosophical Library, \$6), is written from a British point of view and for a British public. To the well-intentioned and well-insulated American it may come as a shock that British industry is not altogether pleased with the American approach to "atoms for peace."

Miss Goldring's book would be a better propaganda weapon in this country were it better organized. The writing style tends to the school of "good rich prose." There are only a few tables and no charts. As a result, it is difficult to absorb the data she does present, to test them for internal validity, or to understand fully her arguments or her conclusions. Repeated glaring errors of fact or interpretation in science, engineering, and history create in the informed reader a wariness not tempered by the author's inability to distinguish between number of significant figures and figures beyond the decimal point. She stands apparently in as much awe of the latter as of the nuclear physicist, the personality of which she appears to derive from the fact that, to her, Sir William Penney has a "choirboy look."

On the other hand, it should be said that submerged in Miss Goldring's rhetoric, her confused data, and her desire to see Greek temples in power plants is an excellent analysis of why Britain and Europe must succeed in development of atomic power and why they must be first. Their fuel situation is bad and is worsened by political developments in the Near East. Fossil fuel is being won at rapidly rising cost. Even primitive atomic-power plants will pay off in that framework. The United States, in a somewhat luckier position in regard to present power costs, cannot afford anything less than very sophisticated atomic-power plants (the one at Shippingsport is already "on stream") and it will be long before they are competitive with other power plants. Miss Goldring forecasts that every power plant constructed in the U.K. after 1965 will be of the atomic type.

—M. B.

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