

specialists to pursue further any topic of interest. The chapters deal with the central nervous system, with the sense organs having to do with taste, smell, equilibration, vision, and hearing, with the complex actions and interactions of the endocrine glands and their effect on other bodily functions, with the various problems of sex, secondary sexual characters, and of reproduction, and with those of energy metabolism, thermoregulation, and body temperature. The other topics covered are less often included in physiological treatises, but they clearly have physiological "roots"; these are flight, breeding seasons, migration, long-distance orientation, the nature and analysis of behavior, and demographic aspects of bird populations—such as longevity, sex ratio, territorial behavior, and the natural regulation of population numbers.

The contributing authors are R. H. J. Brown, D. S. Farner, J. A. Gibb, R. A. Hinde, E. O. Höhn, J. R. King, the late G. Kramer, A. J. Marshall, A. Portmann, R. J. Pumphrey, W. Stingelin, and E. Witschi. To them and to those who gave of their time and energy to the first volume of this highly useful compendium are due the continuing gratitude of all who have occasion to use the volumes.

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Modern Physics for Laymen

The Atom and Its Nucleus. George Gamow. Prentice-Hall, New York, 1961, 153 pp. \$1.95.

Atomic Physics Today. Otto R. Frisch. Basic Books, New York, 1961. vii + 254 pp. Illus. \$4.50.

The Atom and Its Nucleus is both brief and densely packed with ideas. It is carefully organized with a definite continuity that begins with the early chemical evidence for the existence of atoms. The next four chapters present the experiments and the theoretical ideas which led up to the modern view of atomic structure. The development is well handled, within the limitations of extreme brevity.

The two chapters on radioactivity seem less impressive, perhaps because so many others have dealt with this topic on the popular level. The later chapters come alive when the author

discusses the atomic nucleus, nuclear reactions, and the great variety of newly discovered elementary particles.

The careful reader who remembers some elementary algebra and elementary physics will find this book a rewarding summary of the highlights of atomic physics. There is very little mathematics, but this minimum is quite essential to the presentation. One can hardly criticize the author for the inevitable defects of a condensed treatment, but one can criticize the publisher for what seems to be hurried production with errors that will trouble the reader. The illustrations, in particular, show signs of undue haste; for example: I think the reader will wonder how the Davisson Germer experiment could produce a circular diffraction pattern. In one or two other cases the caption and the figure do not agree with each other, nor with the text.

Atomic Physics Today is a collection of articles and lectures and is therefore less rigidly organized. It is almost entirely qualitative and requires a minimum of technical background. Several chapters of this book, also, are devoted to developing the modern picture of atomic structure. In addition, Frisch covers such topics as the economics of nuclear power, the biological effects of radiation, and the use of radioisotopes in medical research and treatment. It should therefore appeal to a much wider audience than *The Atom and Its Nucleus*.

Perhaps the most worthwhile part of *Atomic Physics Today* is the section which describes the "hardware" of modern physics. Here the author does a remarkable job of explaining and putting in proper perspective various devices such as the bubble chamber, nuclear emulsions, scintillation counters, and other instruments essential to particle physics. He gives an excellent summary of the techniques of experimental physics, giving proper credit to the vital instruments which enable us to "see" elementary particles, but which are not so glamorous as the well-publicized accelerators.

The chapters on nuclear models and elementary particles are good, but perhaps suffer from being entirely non-mathematical and from making minimum use of illustrations. The concluding chapters present an interesting speculation about the notion of causality in relation to quantum theory and a well-argued justification for basic research. In spite of the limitations of a wholly verbal approach this may be

an excellent first book for the adult with no previous exposure to physics.

In summary, both books endeavor to present modern physics to the non-physicist; they differ in style and content, and each will appeal to a different group of readers.

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Administration in Education

Governance of Colleges and Universities. John J. Corson. McGraw-Hill, New York, 1960. vii + 209 pp. \$5.50.

The author of this book, the director for an international management consultant firm, who himself has had broad experience not only in business management but also in higher education as a professor and as a trustee, has investigated the obligations and responsibilities of college and university regents, administrators, and faculties. From a survey of institutions of higher education representative of private, public, and denominational colleges and universities with enrollments varying from 800 to 27,000 students, he has sought to determine how such schools are governed and how their governance might be improved.

The study was made to elucidate the general theory behind decision making in such institutions and to determine at what level decisions are made and how they are carried out. Unprecedented demands are about to be made upon colleges and universities because of the imminent increase in the numbers of students, the necessity of adapting higher education to the needs of modern society, and the need to continue to stimulate creativity.

Governance in colleges and universities differs from that of businesses and industries in that it serves a multiplicity of purposes. It must therefore be more dispersed than that of a typical business. The problems of decision making are carefully analyzed from the viewpoint of the board of trustees, the president, the deans, the department chairman, and the faculties. Among the problems are whether the final authority in matters of education policy should be delegated to the faculty, to what extent the faculty should act as advisors to the president and deans, and whether the president should hold himself apart

as a chief executive to whom recommendations go for approval or should serve largely as chairman of the faculty.

Additional discussion is concerned with the degree of communication that should be maintained between the faculty and the trustees and with how it should be maintained; with what organizational arrangements of faculties—such as senates, councils, and committees—can best assemble faculty opinion for the president and trustees; and with how faculties can be trained or persuaded to consider broad aspects of policy rather than the interests of individual disciplines.

Like other enterprises, the administration of a college involves the making of decisions, which are then implemented, communicated to those who must carry them out, and appraised in the light of results and of changing conditions. Unlike the administration of business and industry, good educational administration must focus on the development of the individual and must have the capacity for adaptability rather than the ability to maintain a smooth-running machine: a "tight ship." The goals of a university are not likely to be as clearly defined as those of an industry. They give greater opportunity for individual decisions by faculty members, but concomitantly place larger demands for leadership on presidents and trustees. Furthermore, the product or service provided by the university is less tangible than that of a business or industry. The commitments of the faculty are more likely to be to professions or disciplines than to the university or college itself. Moreover, faculty members expect the privileges of self-direction in their work and of participation in major decisions. As a result, the right to participate in decisions is far more diffused in universities than in almost any other enterprise.

One chapter gives special attention to the influence of outside agencies on the governance of universities: agencies such as contractual research organizations; federal, state, and local governments; accreditation agencies; and donors.

The final chapter is given over to a searching analysis of institutional character. This chapter will be of exceptional interest not only to those who govern universities but to all who are connected in any way with college and university communities.

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Yesterday in Tanganyika

The Lake Regions of Central Africa. A picture of exploration. Sir Richard F. Burton. Introduction by Alan Moorehead. Horizon Press, New York, 1961. vol. 1, xxiv + 421 pp.; vol. 2, viii + 468 pp. Illus. \$15, the set.

The Lake Regions of Central Africa first appeared in 1861. In 1857, Burton had set out with his companion John Speke to reach and explore Lake Tanganyika. When they returned in 1859, they were the first European travelers to have followed the caravan route from the coast to the lake, and they had also made the first circumnavigation of Tanganyika. The route they traveled was already well known to Arab and Indian merchants. Indeed, the expedition would have ended in failure at a number of points had it not been for the hospitality and assistance offered by Arab traders who had established posts far inland. This in no way diminishes what Burton and Speke accomplished, for they were the first to seek to describe the country and to share their knowledge with the world. In the hundred years since Burton's account first appeared, it has become one of the classics of African exploration, notable not only for its description of an Africa of yesterday, set forth in magnificent prose, but also for the light it throws on one of the most remarkable men of the 19th century. Long out of print, it has become a rare book. Now Horizon Press has republished it in a beautiful two-volume edition carrying the original illustrations.

In a hundred years, Tanganyika has changed dramatically, yet Burton's book remains of enduring interest. There is no question of its importance as a historical document. In many instances it is the earliest report on various peoples of the interior. Burton had the seeing eye, the questioning mind, the interest in manners and customs that made him the ideal observer. He could also be opinionated and prejudiced, and sometimes he was just plain wrong, but at this distance, this seems to matter little. His eye for country was even better than his eye for custom. He gives the results of his geographical observations and then tops this with a word picture of the landscape. He describes African villages and Arab trading camps, discusses the

terms of trade, examines the organization of the various types of caravans, and passes free comment upon all whom he encounters. He leaves little to the imagination with regard to the physical hardships and great discomforts to be encountered over almost every leg of the journey.

The reappearance of *The Lake Regions of Central Africa* will be welcomed by anthropologists, historians, and geographers interested in Africa, and no less by all those who enjoy books of exploration.

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Soviet Oceanography

Okeanologiya. L. A. Zenkevich, Ed. Oceanographic Commission, Soviet Academy of Sciences, Moscow, 1961. 190 pp. Illus. \$12.50 per year (six issues per year).

The first issue of a new journal, *Okeanologiya* (*Oceanology*), has just been released by the Oceanographic Commission of the Soviet Academy of Sciences. The journal, which will bring together papers from Russian oceanographic research, should be translated into English as an aid for Western readers who wish to keep abreast of the rapid advances in Soviet oceanography.

Volume 1, Number 1, the first of six issues to be released during 1961 under the general editorship of L. A. Zenkevich, contains 190 pages and includes 16 papers dealing with physical, chemical, biological, and geological oceanography; 2 articles on apparatus and methods; 3 book reviews; and 12 news items. An English table of contents is supplied, but unfortunately no abstracts, either in English or in Russian, are provided.

Twelve basic problems, which are to be reflected in papers published in the journal, are outlined in a nine-page editorial. These problems are: structure of waters of the world ocean and physical processes taking place in it; chemical structure of water masses of the ocean and chemical processes occurring therein; interaction of the ocean and atmosphere; biological structure of the ocean and its organic resources; geologic structure of the ocean floor; structure of the earth's crust under the ocean; interaction of the