exemplary objectivity of the social forces generated by colonialism, nationalism, and even apartheid.

The heart of what Herskovits has to say follows an introductory survey of the aboriginal culture areas of Africa south of the Sahara. In this connection, he considers how and why it is that Africans with agricultural traditions now control the dynamic forces about which he writes. The ensuing pages of *The Human Factor* bring a truly fresh approach to the literature on Africa. Even the well-read will find both new material and new insights into what they already know. In basic design, successive chapters set the scene of human relations within which a series of dramas of culture change takes place. Thus one chapter, "The land," covers the aboriginal meaning of the native earth. Starting with these values, we are led through a still incomplete series of adjustments to pressures on the land, first by Europeans and now by Africans themselves.

Some areas of knowledge about Africa, which were heretofore the domain of a few specialists, achieve just recognition. The chapter entitled "The Book" is an unusual anthropological discussion of Islam and Christianity, through their varying fortunes down to their implications for the present. In "The school" another stepchild of the anthropologist is treated in such a way that enrollment figures are subordinated to the fundamental problems of adapting European educational institutions to the divergent motivations and needs of new Africa.

In the same vein, the focus shifts to other situations and institutions within which traditional lifeways are being reshaped as the old colonies drive toward self-fulfillment. But the politics of nationalism is not handled as a matter of political parties and governmental structures. It is a story of new values, their struggle for expression, and the distinctively African form they achieve. Even economic change is not seen in terms of new industries and gross national products, but is dealt with in terms of working people—labor incentives, work rhythms, and trade unions hybridized in transplantation.

The text is true to its title; the pages deal with people facing problems rooted in African culture and African experience. To read the book is to grow in understanding.

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Bone-Seeking Elements

Radioisotopes and Bone. A symposium organized by the Council for International Organizations for Medical Sciences. Franklin C. McLean, Pierre LaCroix, and Ann M. Budy, Eds. Davis, Philadelphia, 1962. xxiii + 522 pp. Illus. $15.

The evolution of bone, some 400 million years ago, gave the vertebrates physical and biochemical superiority over the other animals, but in our time mineralized tissue can be a serious liability. Bone tissue removes harmful radioactive substances from the tissue fluid and circulating blood and concentrates them in the center of the body around the organs of blood formation. Bone is the storage element for a servo or closed-cycle system composed of highly specialized connective tissue cells that are subject to radiation damage and malignant degeneration. But there is a happy side to the subject, and that is all recounted in this book.

Radioisotopes are responsible for many important advances in our knowledge of the normal and pathological physiology of the skeletal system. This book, *Radioisotopes and Bone,* is primarily designed for active investigators working in the fields of physiology and biochemistry. Between 29 August and 2 September 1960, 47 scientists met (at Princeton, New Jersey) to pool information on and discuss terminology or theory of bone-seeking elements. The book consists of 26 scientific reports including valuable tables of data and many new illustrations. The 15-page bibliography, at the end of the book, lists nearly all of the original literature published during the past 25 years.

The rate at which scientists are working on bone exceeds the present rate at which research findings are published between hard covers. Within a very short time, some articles are superseded by additional work, but some of those in this book are original contributions not published elsewhere.

Four chapters cover the kinetics of calcium metabolism, the mechanisms of calcium homeostasis in experimental animals, and patients with various disorders of bone. Ten chapters deal with the morphology and histophysiology of bone, observed with the aid of autoradiographical techniques. There are single articles on the use of C^{14}-proline for observing the synthesis of protein of bone matrix; H^3-thymidine for labeling the nuclei of cartilage and bone cells; C^{14}-labeled vitamins and hormones for studying intermediary metabolism; S^{35} for the biosynthesis of sulfated mucopolysaccharides of the ground substance of connective tissues. The sodium in the mineral of bone is described both by the transformation of Na^{23} and Na^{24} in undecalcified sections by exposure to a neutron flux and by injections of Na^{22}. The relations of radiation dose to radiation injury with Sr^{90} and the production of bone tumors with P^{32} is dealt with in sufficient detail. The application of radioisotopes to the problems of teeth is also covered in a comprehensive way. Four articles present experimental studies on citrate metabolism, vascular tissue, aging, and ultrastructure of bone.

Pierre LaCroix recognized the need to consolidate the research on the metabolism of radioisotopes in skeletal tissue; thus, thanks to LaCroix and all 47 of the conferees, as well as to the sponsor, the Council for the International Organizations of Medical Sciences, the editors, Franklin C. McLean and Ann M. Budy, were destined to create a very useful volume.

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Engineering Education

Introduction to Chemical Engineering. L. B. Andersen and L. A. Wenzel. McGraw-Hill, New York, 1961. xii + 364 pp. Illus. $9.50.

This volume is one of a series that has been published in an attempt to give undergraduate students of chemical engineering a bird's-eye view of just what chemical engineering is and, at the same time, to give them a grounding in the quantitative principles of the energy-mass balance. The authors also briefly cover a multitude of other physical topics, including phase and chemical equilibria, chemical kinetics, and mathematical methods. A section on digital computer techniques emphasizes the logic of employing flow sheets for a given problem rather than the routine mechanics of computer programming. Some descriptive material which, a decade or two ago, comprised a typical course in industrial chemistry is included under these topics: the chemical process industry; inorganic and organic chemistry; and petroleum and petrochemicals.