employment level was caused by a system instability inherent in the relationship between the purchasing practice of the firm's customers and the firm's own inventory, production, and employment practices. Suggestions for improving the situation were made on the basis of further model runs, but no evidence of their efficacy is presented.

In view of the very exciting beginning presented in *Industrial Dynamics*, one looks forward to further development of the techniques described and particularly to more evidence confirming the ability of the models to accurately point the way to improved managerial performance.

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Three-Dimensional World

IGY. The year of the new moon. J. Tuzo Wilson. Knopf, New York, 1961. xxi + 350 pp. Illus. $5.95.

As president of the International Union of Geodesy and Geophysics, J. Tuzo Wilson was intimately involved both in the preparations for the IGY and in carrying out its program. He traveled some 100,000 miles, visiting installations in such far-away places as Antarctica, China, Greenland, and Taiwan, as well as many others. His account of the IGY is, therefore, a sort of personal narrative which lends great charm to the recital of the tremendous accomplishments of this greatest cooperative scientific enterprise in man's history.

Here we see how the IGY opened up new horizons on the earth, above the earth, beneath the earth, and even beneath the sea. Verily, Wilson introduces us to the new three-dimensional IGY world, and he manages somehow to place things in their proper perspective. For instance, the most publicized aspects of the IGY program—namely, the satellites—fall into proper proportion as he recites the accomplishments of the Soviets versus the Americans.

Wilson's interesting comments on cosmic rays, aurora, and other atmospheric phenomena are especially clear and give new dimensions to our understanding of these phenomena. Being a trained geologist, Wilson gives much attention to the solid earth and the fabulous discoveries made concerning it, discoveries such as the greatest mountain chain in the world. This chain, which stretches along the bottom of the ocean from the north Pacific into the Atlantic and then south around Africa into the Pacific again, is a single chain, 40,000 miles long and with branches of up to perhaps 60,000 miles. The highest mountains in the world, the Hawaiian Islands, are a part of it.

Wilson does not neglect the importance of the human or the sociological aspects of the IGY. Indeed, he ends with the pertinent comment that the IGY demonstrated scientists are also good humanists.

One puts this book down with a realization that the prophetic statement made by Hugh Odishaw, executive director of the United States National Program of the IGY, was soundly true: "The IGY is the single most significant peaceful activity of mankind since the Renaissance and the Copernican Revolution."

Wilson's book is not only a mine of information for the scientist who wants to learn more about the overall achievements of the IGY, but it is written in such lively, clear style that it will intrigue any intelligent reader who wants to extend his knowledge about the manner in which the planet earth fits into the universe.

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Population Control

The Giant African Snail. A problem in economic malacology. Albert R. Mead. University of Chicago Press, Chicago, Ill., 1961. vii + 257 pp. Illus. $7.50.

Economic malacology is a discipline so new that few if any college courses are offered in the subject—this despite the facts that mollusks (both clams and snails) have been used as food by man for centuries, that public health officials must deal with an increasing number of diseases in which mollusks act as vectors, and that horticulturists have long been plagued by snails (usually introduced forms) with an appetite for choice plants. It was not until the Giant African Snail came on the scene, irresponsibly transported throughout the Orient by human agents, that the need for effective means of snail control became urgent. Entomologists, having met and solved similar problems with insect pests, were among the first specialists to be called upon to find a way of checking the burgeoning snail populations. Snail control, however, proved to involve factors more complex than one would suspect, and the control devices all too often set up unanticipated chain reactions.

Mead has the advantage of being a trained malacologist. Although he does not pretend to have found at once the answer to the large problem presented by this number one snail pest, which has been his special study for several years, in both the field and the laboratory, he can make very clear what steps must be taken if a solution is to be reached. In this book he assembles the basic data on what is known about the present dispersal of the Giant African Snail and its habits and on the various control measures that have been tried, with an evaluation of their advantages and disadvantages. He suggests some methods that merit further investigation and reports a population decline (perhaps through disease) in some areas, which may prove significant; otherwise the picture is bleak.

The 41-page bibliography reveals how many facets must be taken into account in the study of such an organism. A graphic summary chart showing the immensely complex relationships of this snail to associated organisms in the field should be required study for anyone contemplating the addition of a fresh predator to the web: a stern warning against further irresponsibility.

As a handbook on methods for a new field, this book sets a high standard. Layman and specialist alike can profit from it, and its interesting style makes it easy reading. The illustrations are clear and well chosen, adding to the general attractiveness of the book.

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Sunlight and Health Hazards

Photochemistry of Air Pollution. Philip A. Leighton. Academic Press, New York, 1961. ix + 300 pp. Illus. $11.

This book brings together the available material in the important but complicated field of air pollution. Sunlight causes photochemical reactions that convert relatively innocuous pollutants into health hazards and major nuisances. In an introductory chapter,

Leighton treats the elementary nature of photochemical reactions. This is followed by a chapter on the nature of sunlight and its intensity over the whole spectrum, but especially the intensity in the high-frequency range active in causing reaction. Next, an effort is made to apportion responsibility for the important reactants among the known absorbers of radiation. These primary reactions lead to a variety of secondary reactions, which are examined and their relative importance assessed. Out of this scientifically interesting complexity the practical problem still remains—the problem of deciding just what it is that causes the changes observed in the atmosphere. It eventually emerges "that all of the major photochemical products, all of the photochemically produced eye irritants and phytotoxicants which have thus far been identified, and probably a major share of the photochemically originated organic particulates in photochemical smog are due to the nitrogen dioxide-olefin photolysis and the reactions which follow."

The author draws on a wealth of experience with photochemical reactions in simple systems. This information is indispensable, but without the careful appraisal that was made of the peculiar situations existing in the atmosphere itself it would not suffice.

This is a pioneering report, and although many features will undoubtedly be modified and amplified with time, no one interested in atmospheric pollution can afford not to read it. It also provides an interesting account of many important reactions and should be widely read by people with an understanding and appreciation of chemical kinetics.

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Panorama of Early Man

The Epic of Man. Editors of *Life* and Lincoln Barnett. Time Inc. New York, 1961. 307 pp. Illus. $13.50.

Beginning in November 1955 and continuing irregularly for a couple of years thereafter, *Life* magazine presented, in installments, a journalistic version of the story of man's physical and cultural evolution. A feature of this series was the colorful and imaginative artist's reconstructions of man and his ways of life at various times and places in the past. Credit for the ideas behind the text and illustrations in each issue was indicated by listing names of scientists, led by the well-known anthropologist, Carleton Coon of the University of Pennsylvania. The fact that a scientist was consulted does not necessarily mean that his suggestions were followed, and certainly not in full. Therefore, the list, while giving an aura of authenticity, actually bears about the same relation to the series as the names on the program of a scientific meeting do to the news accounts emanating therefrom.

Now, 6 years later, mainly the color sections of the series, reedited, rearranged, and indexed, appear in book form. That this time-lapse was not more fully offset by rewriting is unfortunate, because much has happened in this area of science since 1955 and some of the ideas represented in the paintings or expressed in the text are no longer current. For example, in the book earliest recognized man (Zinjanthropus) is still given an antiquity of only 600,000 years (the new figure is 1,750,000 years), whereas the modern variety of man is said to go back nearly half that far (the evidence is very poor). Also, Neanderthal man, who lived until 45,000 years ago, is pictured as a bull-necked, bent-kneed creature, a concept certainly no longer held by many of the authorities cited. I am less sensitive to the cultural details, although some of the reconstructed scenes startled me, for instance on page 51 where so many beautiful women of northern Europe 7000 years ago are shown in such scanty attire.

In spite of such defects and dubious reconstructions from sparse evidence, the book has much to recommend it, not the least being a lively format that is guaranteed to catch and hold the attention of readers of all levels. Once caught, many readers may even be induced to dip into some of the 80 books, written by scientists, which are listed in the bibliography.

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New Books

Biological and Medical Sciences

Annual Review of Entomology. vol. 7. Edward A. Steinhaus and Ray F. Smith, Eds. Annual Reviews, Palo Alto, Calif., 1962. 563 pp. $7.

A Flora of the Alaskan Arctic Slope. Ira L. Wiggins and John Hunter Thomas. Univ. of Toronto Press, Toronto, Ont., Canada, 1962. 437 pp. Illus. $9.50.

Fundamentals of Human Physiology for Students in the Medical Sciences. W. B. Youmans. Yearbook, Chicago, Ill., ed. 2, 1962. $8.50.

Introduction to the Mathematical Theory of Genetic Linkage. Norman T. J. Bailey. Oxford Univ. Press, New York, 1961. 308 pp. $8.80.

Keratin and Keratinization. An essay in molecular biology. E. H. Mercer. Pergamon, New York, 1961. 330 pp. Illus. + plates. $12.

Laboratory Studies in Developmental Anatomy. Theodore W. Torrey. Burgess, Minneapolis, Minn., ed. 2, 1962. 120 pp. Illus.

Methods in Enzymology. vol. 5. Sidney P. Colowick and Nathan O. Kaplan. Academic Press, New York, 1961. 1112 pp. Illus. $28.

The Molecular Control of Cellular Activity. J. M. Allen, Ed. McGraw-Hill, New York, 1962. 335 pp. Illus. $10.50.

Nerves and Muscles. R. Galambos. Doubleday, Garden City, N.Y., 1962. 159 pp. Illus. Paper, $0.95.

Nervous Inhibition. Proceedings of the second Friday Harbor symposium. E. Florey, Ed. Pergamon, New York, 1961. 490 pp. Illus. $15.

The Psychoanalytic Situation. An examination of its development and essential nature. Leo Stone. International Universities Press, New York, 1961. 160 pp. $4. Freud Anniversary Lecture Series, New York Psychoanalytic Institute.

Research and Public Health. Sir John Charles. Oxford Univ. Press, New York, 1961. 122 pp. $4.50.

Rhythmic Activity in Animal Physiology and Behaviour. J. L. Cloudsley-Thompson. Academic Press, New York, 1962. 236 pp. Illus. $6.80.

Second Conference of the International Organization of Citrus Virologists, Proceedings. W. C. Price, Ed. Univ. of Florida Press, Gainesville, 1961. 279 pp. Illus. $7.50.

The Structure and Function of Skin. W. Montagna. Academic Press, New York, ed. 2, 1962. 474 pp. Illus. $16.50.

Symposium on Proteins, Proceedings. 14–16 August 1960. Chemical Research Committee and Society of Biological Chemists of India, Mysore, 1961. 474 pp. Illus. $7.

The Terrestrial Acari of the British Isles. An introduction to their morphology, biology, and classification. vol. 1, *Introduction and Biology*. G. Owen Evans, J. G. Sheals, and D. MacFarlane. British Museum (Natural History), London, 1961. 226 pp. Illus. 40s.

Traité de Paléontologie. vol. 6, pt. 1, *Mammifères.* Origine reptilienne. Évolution. Jean Pivetaeu, Ed. Masson, Paris, 1961. 1138 pp. Illus. NF. 165.

Trematodes of the Pacific Northwest. An annotated catalog. Ivan Pratt and James E. McCauley. Oregon State Univ. Press, Corvallis, 1961. 125 pp. $2.50.

Vitamins and Hormones. vol. 19. Robert S. Harris and Dwight J. Ingle. Academic Press, New York, 1962. 377 pp. Illus. $13.

The Wild Species of Gossypium and Their Evolutionary History. J. H. Saunders. Oxford Univ. Press, New York, 1961. 70 pp. Illus. $2.40.