PLANT PHYSIOLOGY

NATURE RAMBLINGS

by Frank Thone

Low-Grade Ores

WHEN a man-made ore-reducing plant succeeds in paying its way by getting gold out of rock where its presence is measurable in dollars per ton, we pat the inventors and engineers on the back, give them medals and honorary degrees, and maybe even let them keep some of the money for themselves.

Yet plants and animals every day work lower-grade ores than any industrial establishment would ever dream of tackling. They make their livings that way, and they even have so much surplus that man and his hungry-mawed livestock can appropriate large chunks of the products of their living laboratories.

In the soil, potash, nitrates, phosphates and the other minerals needed by plants exist in minute quantities expressed usually as a few parts per million. Yet plant roots can take in huge quantities of soil water containing this exceedingly thin stuff, and the plants' protoplasm extracts from it as much as it needs for its own purposes. So successful is this living extraction process that when we want to replenish worn-out soils with concentrated fertilizers containing the lost elements, we most commonly use the remains of dead plants or animals, either recent or fossil.

But this successful concentration of thin solutions of mineral salts is only an incident in the life of the plant, which has to make its real foodstuffs out of water and thin air—out of a gas that exists in the air only as a small fraction, carbon dioxide. Again the protoplasm, in its specialized bits known as chloroplasts, manages somehow to catch and hang onto this thinner-than-thin stuff, enslave sunbeams to tie it to pieces of broken water molecules, and eventually turn it into carbohydrates and oils. With nitrates added from the soil solution, proteins also are formed.

Animals do not concentrate minerals and foodstuffs directly from soil water and air, as plants do, but they can take some of the partly concentrated stuffs made by the plants and perform some very creditable jobs of further concentration upon them. In an animal's bones, for example, there is a far higher concentration of lime and phosphorus than one commonly finds in plants. The animal has eaten plants containing these minerals and raised the concentration higher. That is why we use bonemeal for a phosphate fertilizer, rather than any plant stuff.

Again, animals eat the starches and sugars, and even the celluloses of plants and concentrate parts of them into fats like butter, lard and bacon, which have a markedly higher energy content per pound than the stuffs out of which they were made.

Science News Letter, November 30, 1935

•First Glances at New Books

Additional Reviews On Page 352

Photomicrography

PHOTOMICROGRAPHY, 13th ed.—*Eastman Kodak Co.,* 121 p., $1. This new edition represents a considerable advance over the twelfth, both in methods and mechanisms described, and in the makeup and appearance of the book itself. There should be a copy of this handy manual in every laboratory where microscopic work is carried on.

Science News Letter, November 30, 1935

Chemistry

GENERAL CHEMISTRY FOR COLLEGES—Herman T. Briscoe—*Houghton Mifflin,* 872 p., $3.75. Prof. Briscoe has prepared a very comprehensive text in elementary college chemistry which should serve the needs of those teachers who want more material than is commonly provided in the usual textbook. Containing too much information to be given in a normal one-year course, the various chapters are so arranged that almost any type and length of course can be presented. Good typography, many diagrams and scores of industrial pictures add readability to the other merits of the book. A ten-page index is provided.

Science News Letter, November 30, 1935

Herpetology

A CONTRIBUTION TO A KNOWLEDGE OF THE HERPETOLGY OF A PORTION OF THE SAVANNA REGION OF CENTRAL PETEN, GUATEMALA—L. C. Stuart—*Univ. of Mich. Press,* 65 p., 50c.

Science News Letter, November 30, 1935

Biology

THE DARTERS OF THE GENERA HOLOLEPIS AND VILLORA—Carl L. Hubbs and Mott D. Cannon—*Univ. of Mich. Press,* 100 p., 50c.

Science News Letter, November 30, 1935

History

COFFEE: THE EPIC OF A COMMODITY—Heinrich E. Jacob—*Viking,* 296 p., $3.50. Fascinatingly written and ably translated (by Eden and Cedar Paul), this book tells the story of coffee from its first appearance as "Islam's wine" a thousand years and more ago, down to its present state as one of the major economic factors (and hence troubles) of the modern world. The illustrations are numerous, well chosen, well reproduced.

Science News Letter, November 30, 1935

Marine Biology

WATER PEOPLE—Wilfred Swancourt Bronson — *Wise-Parslow,* 104 p., $1. Fishes and other water creatures, fascinatingly pictured and entertainingly written up. If you have any bright youngsters of eleven or twelve or older on your Christmas list, here is a sure-to-please present. The growing army of Bronson "fans" will buy, regardless of their ages.

Science News Letter, November 30, 1935

Botany

AN ILLUSTRATED MANUAL OF PACIFIC COAST TREES—Howard E. McMinn and Evelyn Maino—*University of California Press,* 409 p., $3.50. The native and introduced trees of California, adequately described and illustrated, with suggestions regarding their horticultural, agronomic and industrial uses. An exceedingly useful appendix condenses this latter information into groups of trees classified according to uses.

Science News Letter, November 30, 1935

•First Glances at New Books

Additional Reviews On Page 351

Current History

RIVALRIES IN ETHIOPIA—Elizabeth P. MacCallum—*World Peace Found.,* 64 p., 50c. There is a far-reaching background to the present controversy over Ethiopia. The economic and political situation involving the British, French and Italian penetration into Ethiopia during several decades is set forth in this factual study.

Science News Letter, November 30, 1935

Endocrinology

GLANDS AND EFFICIENT BEHAVIOR—Florence Mateer — *Appleton-Century,* 243 p., $2.50. The use of many illustrative case histories makes this book extremely readable and will probably achieve its author's object of impressing parents, teachers and physicians with the way in which gland therapy can improve many a child's behavior.

Science News Letter, November 30, 1935

Photography

PROFITABLE ENLARGING AND THE MINIATURE CAMERA—H. Rossiter Snyder—*Rossiter Snyder Pub. Co.,* 40 p., 50c. Tenth in a series of booklets telling how to make money out of photography. What to photograph and how to dress it attractively for sale are but two of the items disclosed. Many ifs and ands about the subject of miniature photography are given. It is not all snapping the shutter.

Science News Letter, November 30, 1935

Music—Electricity

A FUGUE IN CYCLES AND BELS—John Mills—*Van Nostrand,* 269 p., $3. In his lucid style, Mr. Mills tells how science has brought music to large audiences through electrical amplifying systems and to millions through the radio. More than that, he tells how science is actually changing music and bringing in new musical techniques.

Science News Letter, November 30, 1935

Engineering

THE REFRIGERATING DATA BOOK AND CATALOG—*American Soc. of Refrigerating Engineers,* 576 p., $3.50. The refrigerating equivalent of the Handbook of Chemistry and Physics, now in second edition.

Science News Letter, November 30, 1935

Philosophy of Science

PHILOSOPHY AND THE CONCEPTS OF MODERN SCIENCE—Oliver L. Reiser—*Macmillan,* 323 p., $3.50. Highly stimulating is this synthesis of science and philosophy. Relatively new ideas in physical and natural science, born largely of the impact of the new physics upon modern thought in other branches of science, are set forth with a breadth and background that are very useful. In the second part, which considers philosophy and the social sciences, emphasis is put upon the idea that human history can be interpreted in terms of the amount of energy available. The closing chapter analyzes humanism as a new religion or philosophy based upon the concepts of modern science.

Science News Letter, November 30, 1935

Chemistry

THE OPTICAL BASIS OF THE THEORY OF VALENCY—R. de L. Kronig—*Macmillan,* 246 p., $4.50. A highly technical book for those chemists who are band spectroscopists. He collects the research in physics relating to valence and chemical binding as gleaned from band spectrum experiments. It is valuable in its field, but tough going, for those who are not specialists in spectroscopy.

Science News Letter, November 30, 1935

Biology

GENETIC VARIATIONS IN RELATION TO EVOLUTION—H. S. Jennings—*Princeton Univ. Press,* 138 p., $2. Some of the newer things in genetics, discussed in their bearing on the problems of evolution by a veteran investigator in this field who, however, knows how to present his facts and interpretations in such a way that any fairly well educated person can grasp them.

Science News Letter, November 30, 1935

Biophysics

BIODYNAMICA — edited by Basile J. Luyet—*Normandy, Mo.,* $1.50 per volume. This recently established journal, devoted to "the elaboration and the experimental study of working hypotheses on the nature of life," is published on a unique plan: it is not issued at regular intervals, but as material develops —about 100 pages a year. Recent contributions have concerned themselves with the specific gravity of protoplasm, ultraviolet absorption by protozoan cells, the specific heat of erythrocytes, and kindred subjects.

Science News Letter, November 30, 1935

Paleontology

THE BOOK OF PREHISTORIC ANIMALS—Raymond L. Ditmars—*Lippincott,* 64 p., $2. Saurians, mastodons, titanotheres, the whole lumbering world of animate antiquity interestingly presented by Dr. Ditmars, and as interestingly pictured by Helene Carter. A feature of especial excellence is the setting of the animals of various geological ages on two-page picture-maps of the continents as they then were. This is a device that might profitably be adopted in much more formal treatments of historical geology.

Science News Letter, November 30, 1935

Medicine

FREE MEDICAL CARE — SOCIALIZED MEDICINE—E. C. Buehler—*Noble and Noble,* 360 p., $2. One of the volumes in the University Debaters Help Book Series, this should ably fulfill its purpose of aiding those who support either side of the subject in a debate. Definitions of terms, briefs of both affirmative and negative arguments, bibliography and reprints of numerous articles by authorities on both sides of the question are included.

Science News Letter, November 30, 1935

Astronomy

ASTRONOMY—Arthur M. Harding—*Garden City Publ. Co.,* 418 p., $1.98. Written in very elementary terms, employing an easy, chatty style, with the subject matter broken up into very short paragraphs, this book should appeal very strongly to younger readers—though it is in no sense "written down" for any set age level and can be read with much pleasure and profit by older persons as well.

Science News Letter, November 30, 1935

Physiology

A TEXTBOOK OF PHYSIOLOGY—William D. Zoethout—*C. V. Mosby Co.,* 694 p., $4. Fifth edition of a text designed for students in dental, pharmacy and normal schools, who have not too much time to devote to the subject. In this edition there is much new material, especially on the hormones, vitamins, muscles and nervous system.

Science News Letter, November 30, 1935