

# New Books

## Annual Review of Plant Physiology. Vol. IX

Edited by A. S. CRAFTS, LEONARD MACHLIS, and JOHN G. TORREY. 510 pages. Annual Reviews, Inc., Palo Alto, Calif. 1958. \$7.00. Reviewed by A. E. HITCHCOCK, Boyce Thompson Institute, Yonkers 3, N. Y.

THE 15 chapters in this volume describe recent advances in plant physiology up to late 1957. A preface by Editor A. S. Crafts assesses the need for reorientation in many phases of plant physiology—given in a reflective and speculative mood while in Oxford, England.

The topics, authors, and this reviewer's comments are as follows: "The Quantum Yield of Photosynthesis," R. Emerson—evidence pro and con for the concept of the "energy trap," whereby excitation energy from all chloroplast pigments is funneled into chlorophyll-a, and thence to biochemical steps in photosynthesis; "Physiology of Salt Tolerance," L. Bernstein and H. E. Hayward—osmotic inhibition of growth, nutritional imbalance, and moisture availability in saline soils; "The Naturally-Occurring Auxins and Inhibitors," J. A. Bentley—methodology stressed, and concludes indoleacetic acid is not the auxin physiologically active in normal growth; "Destruction of Auxin," P. M. Ray—concludes there is no actual connection between auxin destruction and the growth mechanism; "Metabolism of Ascorbic Acid in Plants: Part I. Function," L. W. Mapson—suggests dehydroascorbic acid-ascorbic acid system acts as respiratory carrier but ascorbic acid is not proved essential for plants; "Physiology of the Tobacco Plant," R. A. Steinberg and T. C. Tso—deals with physical and chemical qualities of the leaf, and describes all phases of culture and curing; "Mineral Nutrition of Tree Crops," W. Reuther, T. W. Embleton, and W. W. Jones—leaf analysis, mineral deficiencies and interrelationship of elements in relation to fertilizer practices; "Physiology of the Fresh-Water Algae," R. W. Krauss—considers cultural techniques, nutrition, N metabolism, C assimilation, vitamins, hormones, and pigments; "The Metabolism of Amino Acids and Proteins in Plants," E. W. Yemm and B. F. Folkes—critical discussion favoring the "amino acid" hypothesis for regulation of glycolysis and cell respiration over the "alternative" hypothesis of protein synthesis

by recycling; "Auxin Uses in the Control of Flowering and Fruiting," A. C. Leopold—describes background for practical applications of auxins; "Herbicides," E. K. Woodford, K. Holly, and C. C. McCready—discusses mechanisms of action; "Morphogenesis in Lower Plants," L. F. Jaffe; "Postharvest Physiology of Fruits," R. Ulrich—changes associated with ripening and senescence; "The Biogenesis of Flavonoids," L. Bogorad—suggested sequence of reactions in flavonoid biosynthesis; "Cytochromes in Plants," L. Smith and B. Chance—methodology, oxidative systems, respiratory mechanisms, and light induced reactions.

## Our Hormones and How They Work

SARA R. RIEDMAN. Abelard-Schuman. New York 1957. 168 pages. Illustr. \$2.50. Reviewed by FRANCIS JOSEPH WEISS, Arlington, Va.

BEGINNING with the dramatic story of the saving of a life by the first administration of insulin, Dr. Riedman presents in simple and understandable form a fascinating account of the discovery of the hormones and their functions in human, animal, and plant life. She discusses the organs of glandular secretion and the application of the latter in human and veterinary medicine. An interesting chapter covers "auxins" or plant hormones and the prospects they hold for higher yields and better crops.

Agricultural chemists and food technologists will find Dr. Riedman's book particularly valuable and most appropriate to their special field of endeavor, since there hardly exists any aspect of animal or plant life in which hormones do not play an important role. In animal and plant breeding, fertilization, reproduction, dairy, poultry, and egg production, and animal and human metabolism, the proper function of hormones is of utmost importance; their malfunction is the cause of inefficiency and economic loss, disease and death.

## Chemical Aspects of Ecology in Relation to Agriculture

By HUBERT MARTIN. Queen's Printer, Ottawa, Canada. Pub. 1015: 1-96. 1957. \$3.00. Reviewed by JAMES G. HORSFALL, Connecticut Agricultural Experiment Station, New Haven.

MARTIN has taken a novel, and as usual for Martin, an exceedingly stimulating approach to the term ecology.

The usual study of ecology sometimes impresses me as a type of dynamic flagpole sitting. It aims to assess the interactions of plants and animals, but often uses a pretty static approach.

Martin's approach is dynamic. Martin dredges up from the literature a fantastic collection of references on the chemical aspects of cooperation and competition among and between four groups of organisms—fungi, bacteria, insects, and higher plants.

Almost any organism can poison others of its kind. In laboratory cultures we used to call these poisons staling products, until their chemistry was established. In the field we refer to soil sickness, and resort to crop rotation.

Fungi and bacteria, of course, fight higher plants—and higher plants fight back. This is plant pathology. Only recently have we been able to make the chemistry of these problems sit up and beg.

Similarly, insects and higher plants conduct chemical warfare with each other. This is entomology.

Then, of course, we have cases where fungi and bacteria, fungi and insects, bacteria and insects engage in chemical combat. Martin gives data on many of the compounds that are involved.

Then, there are cases in which these organisms chemically cooperate with each other. The combinations are endless.

This review is no place to discuss the details of the subject. One example should suffice. Martin cites the case of the larvae of the cabbage butterfly that feeds only on plants containing mustard oil glycosides. They will feed on other green plants or even on dried leaf powder of other plants if the parts are smeared with the glycosides. The gustatory stimulus is reduced if the glycosides are subjected to enzymatic hydrolysis. This indicates that the mustard oils themselves are necessarily responsible even though they are odorous.

This is a very valuable little book.

## Safety in Handling Phosphorus Pentasulfide

Safe handling practices for phosphorus pentasulfide, a highly reactive intermediate used in making insecticides and organophosphorus compounds, are described in a new safety data sheet just issued by the Manufacturing Chemists' Association.

Since phosphorus pentasulfide reacts rapidly with water or with the moist-

ure in the atmosphere to release hydrogen sulfide, a poisonous flammable gas, the manual details safe handling practices for chemical workers.

MCA's 14-page safety booklet shows how hazards can be avoided, describes protective equipment for high gas concentrations, recommends safe handling containers and waste disposal methods. First aid measures and suggestions for physicians also are included.

In addition to its importance in insecticide manufacture, phosphorus pentasulfide is used in production of lubricating oil additives and as a catalyst in the production of air-blown asphalt for roof surfacing.

Copies of "SD-71, Phosphorus Pentasulfide" are available for 30 cents a copy from the Manufacturing Chemists' Association, 1625 Eye Street, N.W., Washington 6, D. C.

## **LITERATURE AVAILABLE**

**Batch Weight Recorder.** Two-page, two-color bulletin shows use of inventory counter and totalizer, outlining how instrument provides accurate account of how much material has been taken from storage, how much has been used per batch, hour, day, or week, in operations involving up to 24 ingredients. For copy of Product Data Sheet 5805, contact Hart Bandstra, Dept. A&F, RICHARDSON SCALE CO., Clifton, N. J.

**Consultant Services.** Trace analyses in foods, screening for new uses, toxicology and safety evaluations, quality control, industrial hygiene, and other types of basic and applied research done by independent biological research laboratory. Field consultation available. For further information, write for detailed brochure. Dept. A&F, HAZLETON LABORATORIES, INC., Box 333, Falls Church, Va.

**Feed Rate Regulator.** Brochure describes "electric ear," an electronic device for regulating feed rate to grinding mills, based upon grinding sound from the mill. Instrument includes a sound-level recorder, which makes it possible to keep a 24-hr. record of grinding mill operations, and indicates variations which may adversely affect efficient operation. Bull. AH-480, Dept. A&F, HARDINGE CO., INC., York, Pa.

**Films Available.** Booklet, "Film Reviews," describes six films, one of which is entitled "The Case of the Disappearing Poison," a discussion of TEPP insecticide. Available upon request from Dept. A&F, CHEMICALS AND PLASTICS DIVISION, EASTMAN CHEMICAL PRODUCTS, INC., 260 Madison Ave., New York 16, N. Y.

**Flavor Catalog.** Illustrated catalog covers 30 different flavor groups embracing a total of over 700 varieties of flavors. Distribution limited to those who buy in wholesale quantities. Dept. A&F, FRITZSCHE BROTHERS, INC., 76 Ninth Ave., New York 11, N. Y.

**Fluorescent Compounds.** Research centering on the fluorescent qualities of various compounds accelerated through use of an instrument called Aminco-Bowman Spectrophotofluorometer. Scientific papers published on this instrument are incorporated into a bibliography. This publication, and Bull. No. 2278, which describes instrument, may be obtained from Dept. A&F, AMERICAN INSTRUMENT CO., INC., 8030 Georgia Ave., Silver Spring, Md.

**Micro-prilled Feed Urea.** Four page folder points out that company's coated micro-prilled urea is free flowing and the particles are right size for blending properly with other ingredients for even distribution through the finished feeds. For more detailed information, Dept. A&F, SOHIO CHEMICAL CO., Lima, Ohio.

**New Products Catalog.** Properties and uses of 375 industrial, pharmaceutical, and agricultural chemicals described in 1958-59 issue now available from Dept. A&F, THE DOW CHEMICAL CO., Midland, Mich.

**Pneumatic Conveying Systems.** Illustrated, 16-page bulletin points out how pneumatic conveying systems can reduce plant operating costs and improve efficiency. Bulletin covers high-density (fluidizing type) and low-density conveying systems and equipment. Installation arrangements diagrammed. Photos show actual installations, basic equipment and accessories. Request Bull. M-588, Dept. A&F, DAY SALES CO., 810 Third Ave. N.E., Minneapolis 13, Minn.

**Potassium-Magnesium Sulfate.** Bulletin, issued periodically, reviews many of the results growers and farmers are getting from sulfate of potash and Sul-Po-Mag, and tells of any new developments in sulfate. To be put on mailing list, write S. B. McCoy, Mgr., Agricultural Sales, Dept. A&F, POTASH DIVISION, INTERNATIONAL MINERALS & CHEMICAL CORP., Old Orchard Rd., Skokie, Ill.

**Shipping Drums.** Pamphlets review advantages of and explain uses of open- and tight-head 55-gal. drums; single- and double-blade, 55-gal. agitator drums; open and closed 15-gal. drums; and 100- and 120-lb., open-head, grease drums. Write Dept.

A&F, PRI, VULCAN CONTAINERS INC., Bellwood, Ill.

**Story of Pest Control.** Booklet, entitled "Open Door to Plenty," tells the story of agricultural chemicals and how they are used to protect food, property, and health. This 64-page, illustrated booklet reviews the progress made in control of all types of pests, and reports on future benefits to be expected. Write Dept. A&F, NATIONAL AGRICULTURAL CHEMICALS ASSOCIATION, 1145 Nineteenth St. N.W., Washington 6, D. C.

**Surface Active Agent.** Technical bulletin on *N*-acyl sarcosine surfactants known under the tradename Sarkosyl. Compounds may be considered as modified fatty acids in which the hydrocarbon chain is interrupted by an amidomethyl ( $-\text{CON}(\text{CH}_3)-$ ) group. This modification is said to impart greater solubility and crystallinity to the molecule, increase the acidity of the carboxylic acid group, and enhance adsorption characteristics. For greater details write Dept. A&F, GEIGY INDUSTRIAL CHEMICALS, Saw Mill River Rd., Ardsley, N. Y.

**Sulfur Dioxide.** A 15-page, 2-color booklet on sulfur dioxide discusses physical and chemical properties, specifications and specification test methods, suggested uses, toxicity, and shipping and handling procedures. Designed for use by those who use sulfur dioxide in manufacturing. May be obtained by writing Dept. A&F, Chemical Products Division, ANSUL CHEMICAL CO., Marinette, Wis.

**Trademark Information.** File of trademarks in the chemical and allied fields, located in Coliseum Towers, New York City, ready for immediate use. For further information, write CHEMINFORM INSTITUTE, 10 Columbus Circle, New York 19, N. Y.

**Wall Chart for Fungicidal Levels.** Quick reference wall chart lists properties, suggested applications, and recommended treatment levels for 22 industrial fungicides. May be obtained from Dept. A&F, NUODEX PRODUCTS CO., Elizabeth, N. J.

**Water-Soluble Gums.** Sixty-page handbook gives information and use data on Methocel, Dow's trademark for a family of methylcellulose ethers. Presented are physical properties of the compound, its chemical composition, preparation of solutions, effect of additives, gelation of solutions, and other essential information. Copies may be obtained from Dept. A&F, Organic Chemical Sales, THE DOW CHEMICAL CO., Midland, Mich.