SCIENCE

VOL. 96 FRIDAY, OCTOBER 16, 1942 NO. 2494

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE CHEMIST IN THREE WARS[1]

By OTTO EISENSCHIML

PRESIDENT, SCIENTIFIC OIL COMPOUNDING COMPANY, CHICAGO

THE CIVIL WAR

AT the beginning of the Civil War chemistry was in its infancy. The chemical requirements of armies at that time were, of course, proportional to the world's contemporary scientific standards; they comprised in the main the procurement of a few basic materials such as iron, copper and saltpeter; among manufactured products, gunpowder was the most important. Small as these demands appear when compared to those of modern fighting forces, they constituted problems of magnitude for the chemists and industrialists of the time.

The agricultural South, having built its economic structure on cotton, found itself in a precarious position at the outset of the conflict. According to census figures for the year ending June 1, 1860, the United States had produced in twelve months 884,474 tons of pig iron; out of this total the South, represented only by Tennessee and Virginia, had contributed a mere 25,513 tons. The blast furnaces in the South were small and antiquated; a daily output of thirteen tons, reached by newly erected furnaces in Alabama, was considered a decided improvement over the older plants of Virginia and Tennessee. The methods used were obsolete, chemical control unknown. In many cases iron ore and fuel had to be brought from distant places by a dilapidated railroad system or by teams; nevertheless, the Confederacy is said to have produced 50,000 tons annually during the war—a remarkable achievement, especially in view of the

[1] A paper read before the American Institute of Chemists at Chicago, September 18, 1942.

TABLE II

ANTIHELMINTHIC ACTIVITY ON ASCARIS LUMBRICOIDES FROM INTESTINE OF THE PIG. (pH 5, BUFFERED WITH CITRIC ACID AND DISODIC PHOSPHATE, AT 40° C)

Enzyme concentration	2 hours	4 hours	8 hours	24 hours
1 per cent.	An ulcer attaining body cavity	Partial digestion	Intense digestion	Total digestion
0.5 " "	Several ulcers	Incipient digestion	Partial digestion	Total digestion
0.1 " "	No change	Several ulcers	Incipient digestion	Partial digestion
0.05 " "	No change	No change	Several ulcers	Partial digestion

The fresh latex and dry weight relation is 30 per cent., while in papain it is only 20 per cent.

Pileus mexicanus is quite abundant in Mexican tropical regions, making its industrialization possible, to compete with papain. Methodic breeding of the plant would be an important source of the enzyme. We propose the name of "mexicain" for this enzyme.

M. CASTAÑEDA
F. F. GAVARRON
MARÍA R. BALCAZAR
ESCUELA NACIONAL DE CIENCIAS BIOLÓGICAS,
INSTITUTO POLITÉCNICO NACIONAL,
MEXICO, D. F.

FUNGICIDAL VALUE OF THE SALICYLATES

THE problem of finding suitable substitutes for copper fungicides is becoming increasingly important. In recent discussions, prominent mention has been made of such organic compounds as phenothiazine, tetramethyl thiouram disulfide and ferric dimethyl dithio carbamate. However, one of the major needs for copper fungicides is in the control of various downy mildew diseases (caused by species of *Phytopthora, Peronospora* and *Pseudoperonospora*), and information as to possible copper substitutes in this field appears to be lacking. During the past ten years, the Bureau of Plant Industry, in cooperation with the state experiment stations of Georgia, South Carolina, North Carolina and Maryland, has conducted an extensive search for sprays effective against the blue mold or downy mildew disease of tobacco. The organic compounds mentioned above have been tested along with numerous others. Most promising results have been obtained with the salicylates, practically all of which were more or less effective. The best of these compounds so far tested has been bismuth subsalicylate, used at the rate of 1½ pounds, plus 1 pound of Vatsol O.T.C. (sodium dioctyl sulfosuccinate) in 100 gallons of water. With the aid of the wetting agent, the subsalicylate makes a quick and stable suspension, and the spray adheres very well to tobacco leaves. This spray used against blue mold has given excellent control, with strong residual protection after spraying was discontinued, and no plant injury. It has been superior to the regular copper oxide-oil in all three respects, and the copper oxide-oil has, in turn, been much superior to bordeaux mixture. The second best of the salicylate mixtures so far developed has been benzyl salicylate, one fourth pound dissolved in 1 gallon of cottonseed or soybean oil, emulsified and diluted to 100 gallons. This mixture has been very effective, but has occasionally caused plant retardation, and it does not have quite the residual protection of the previous. Salicylic acid and zinc salicylate at the rate of one half pound dissolved in 1 gallon oil, emulsified and diluted to 100 gallons, have been effective fungicides, but likely to cause plant injury. Materials showing some promise are butoxyethyl salicylate, dinitrosalicylic acid and salicyl salicylic acid, all at the one half pound rate in oil. So far, most of the salicylates do not appear to be critical materials, but difficulties regarding availability and price may be expected. It would seem most important to find out as soon as possible what fungicides can be used against each specific disease, and it would not be surprising if very much improved spray treatments would ultimately result.

E. E. CLAYTON
BUREAU OF PLANT INDUSTRY,
U. S. DEPARTMENT OF AGRICULTURE

BOOKS RECEIVED

British Graham Land Expedition, 1934–37: Vol. 1. J. P. HARDING. *No. 6, Lower Crustacea.* 9 figs. Pp. 4. 1s. O. W. RICHARDS. *No. 7, Sphaeroceridae (Diptera).* 1 fig. Pp. 4. 1s. BRIAN ROBERTS and R. H. CORKAN. *No. 8, Tidal Observations in Graham Land.* 5 figs. Pp. 9. 1s. BRIAN ROBERTS. *No. 9, A Bibliography of Antarctic Ornithology.* 1 fig. Pp. 33. 2s. 6d. British Museum (Natural History).

CASTETTER, EDWARD F. and WILLIS H. BELL. *Pima and Papago Indian Agriculture.* Pp. xv + 245. The University of New Mexico Press.

ENGELDER, CARL J. *Calculations of Quantitative Analysis.* Second edition. Pp. x + 174. John Wiley and Sons, Inc. $2.00.

Expedition to South-West Arabia, 1937–8. Vol. I. Nos. 1–8. Illustrated. Pp. xiv + 66. The British Museum. 7s. 6d.

FIELD, R. M. and H. T. STETSON. *Map Reading and Avigation.* Illustrated. Pp. xiii + 129. H. D. Van Nostrand Company, Inc. $2.50.

HAWTHORNE, KENNETH C. *How to Get Ahead in a Defense Plant.* Illustrated. Pp. xvi + 270. Thomas Y. Crowell Company. $2.50.

Philosophical Essays in Honor of Edgar Arthur Singer, Jr. Edited by F. P. CLARKE and M. C. NAHM. Pp. x + 377. Philadelphia: University of Pennsylvania Press. London: Oxford University Press. $3.50.

SNODGRASS, R. E. *The Skeleto-muscular Mechanisms of the Honey Bee.* Pp. 20. The Smithsonian Institution.

TANNEHILL, IVAN RAY. *Hurricanes.* Illustrated. Pp. x + 265. Princeton University Press. London: Oxford University Press. $3.50.

Textbook of General Botany. Fourth edition. Illustrated. Pp. x + 668. Macmillan. $4.00.

VON ENGELN, O. D. *Geomorphology.* Illustrated. Pp. xxii + 655. Macmillan. $4.50.

WESSON, LAURENCE G. *Outline of the Chemistry of Dental Materials.* Pp. 106. C. V. Mosby Company.