

Acyelic and isocyclic compounds are discussed together in chapters whose headings are determined by the particular functional groups present. Thus, the chapter entitled "Hydroxyl Derivatives of Hydrocarbons" deals with Alcohols, Polyhydroxy Alcohols, Unsaturated Alcohols, Cyclic Alcohols, Sterols, Aromatic Alcohols, Phenols and Halogenated Hydroxyl Compounds, in that order. After considering the acyclic and isocyclic compounds in such chapters, there follow two on Heterocyclic Compounds and a final one on Stereoisomerism. Before proceeding to a consideration of the separate chapters, a bibliography of standard reference works likely to be helpful to the reader, and occupying five pages, is inserted; in addition to which numerous references are given throughout the text.

Although, as already noted, the classification varies somewhat from the conventional, the volume constitutes an abbreviated text-book of organic chemistry, in which the usual sections on isomerism, nomenclature, preparation, physical and chemical properties, are supplemented by paragraphs or sections on physiological activity and, where justified, on the apparent connection between such activity and chemical structure. Pharmacological and therapeutic information is presented concisely without attempting to record details more appropriate for treatises in these special fields. Uses and modes of administration are also recorded, as well as the accepted trade names for the more important drugs.

The ancient materia medica, consisting largely or wholly of natural products of complex and variable composition, are rapidly being displaced by the products of the organic chemists' laboratory, and ere long most of them will be as extinct as the dodo, giving place to such triumphs of the laboratory as arsphenamine, the hormones, vitamins and the sulfanilamides. The book is profusely illustrated with structural formulas, tables, charts and diagrams, and is provided with an excellent index. A laboratory manual to accompany the text has been prepared by Drs. Hartung, Summerford and Dunker.

Chemistry of Insecticides and Fungicides. By DONALD E. H. FREAR. viii + 300 pp. $6\frac{1}{4} \times 9\frac{1}{4}$ in. New York: D. Van Nostrand Company, Inc. April, 1942. \$4.00.

IN these days of global warfare, when every one is praying for an early cessation of the conflict, we can not overlook the fact that we are engaged also in another kind of struggle, in which our enemies are not fellow humans but other living organisms, and that this war has been going on since the dawn of man's history and will probably continue until its close. Little is to be feared from the larger animals,

for they all recognize man as their master and their fate as in his hands; but it is in the smaller animals and the lower forms of life that man finds his deadliest and most implacable enemies. These attack him either directly, by causing various diseases, or indirectly by destroying his means of subsistence. One of the important hostile armies in the latter category is that of the plant pests, and the present book discusses the chemistry of those compounds which have been found useful as insecticides or fungicides, in order that the campaign against these enemies may be conducted more intelligently and more successfully.

The text is based upon a graduate lecture course organized and given by the author at the Pennsylvania State College, and each chapter concludes with an excellent bibliography.

After the Introduction, the separate chapters are grouped under five general headings as follows: *Part I. Stomach Poisons or Protective Insecticides.* Arsenicals, Lead Arsenate, Fluorine Compounds and Miscellaneous Stomach Poisons; *Part II. Contact Poisons or Eradicator Insecticides.* Nicotine and Pyrethrum, Rotenone and Miscellaneous Contact Poisons, Sulfur and Inorganic Sulfur Compounds, Oils and Fumigants; *Part III. Fungicides.* Copper Compounds, Mercury Compounds and Miscellaneous Fungicides. *Part IV. Spray Supplements and Residue Removal.* Wetting, Spreading and Emulsifying Agents, and Spray Residue Removal; *Part V. Analytical Methods.* Macro Methods and Micro Methods.

As can be seen from these titles, the book should be useful to inorganic, organic and bio-chemists, as well as to plant pathologists and economic entomologists, and it is cordially commended to them. Paper, type, presswork and binding are admirable; the proof-reading has been done carefully; and some interesting illustrations of natural products are included.

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A FRESHMAN TEXT IN MATHEMATICS

Basic College Mathematics, A General Introduction. By CARL WALLACE MUNSHOWER and JAMES FLETCHER WARDWELL. xiii + 612 pp. New York: Henry Holt and Company. 1942.

THIS text is designed to cover in one year essential selected topics in algebra, trigonometry, analytic geometry and calculus, so as to provide a profitable terminal survey for students taking but one college course in mathematics, and also an introduction for those who prepare for further mathematical work. The subject-matter organization is intended to furnish a psychologically acceptable unified course with the rate concept introduced in the first chapter. So much material has been provided in these twenty-one

chapters that many teachers might desire to omit some entire chapters. The planning of these separate chapters is expected to afford wide freedom of choice for such omission, or for rearrangement, without interfering with the student's progress. The chief claim to novelty lies in the wide variety of fields from which verbal problems have been gleaned. The text has been prepared with somewhat more than average care, al-

though the reviewer notes several definitions and formal explanations which seem not above criticism. Answers are provided for odd-numbered problems. Approximately the last hundred pages are devoted to numerical tables, reference formulas and (somewhat incomplete) index.

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SPECIAL ARTICLES

AN INFECTIOUS AGENT FROM CASES OF ATYPICAL PNEUMONIA APPARENTLY TRANSMISSIBLE TO COTTON RATS¹

RECENTLY a primary atypical pneumonia of unknown etiology has been a rather common disease.² Observations made in this laboratory since March, 1941, suggest that in some cases of this disease an infectious agent is transmissible to cotton rats (*Sigmodon hispidus*) and produces pulmonary consolidation after the first intranasal inoculation of sputum or lung under ether anesthesia. Both the eastern cotton rat (subspecies *hispidus*) and the western cotton rat (subspecies *eremicus*) are susceptible.

The results with material from a total of 78 cases of atypical pneumonia are summarized in Table 1.

TABLE 1
RESULTS OF INOCULATING COTTON RATS WITH SPUTUM OR LUNG TISSUE FROM CASES OF ATYPICAL PNEUMONIA

	Days after onset	Number of specimens causing lung lesions	Number of specimens causing no lung lesions
Sputum	5 or less	8	11
Sputum	6 to 9	4	15
Sputum	10 or more	1	19
Sputum	unknown	2	9
Lung	2	7
Total		17	61

Similar material gave negative results in mice, ferrets, hamsters and other animals. Sputums taken early in the disease often produced lung lesions rather consistently when several cotton rats were inoculated with the same specimen. Fully grown or old animals were more susceptible than those 3 to 7 weeks of age. Of the total of 131 cotton rats receiving material

from cases of atypical pneumonia 35 developed lung lesions. Thirty-four control cotton rats inoculated intranasally with throat washings from cases of influenza or with heated sputum, horse serum broth or other materials did not develop significant lung lesions. All animals were sacrificed 7 days after inoculation. Only one out of more than 50 cotton rats used in experiments not connected with atypical pneumonia has shown lung lesions at autopsy.

By serial intranasal passage of lung suspensions from animals which had lesions on the first passage, strains of an infectious agent from 6 cases of atypical pneumonia were adapted to cotton rats. In 2 cases this adaptation was repeated, starting from the original sputum, but using cotton rats of a different subspecies. After 4 to 6 passages the adapted strains produced gross evidence of lung involvement in over 90 per cent. of the animals inoculated, but seldom caused death. With sputum from 11 cases lung lesions were produced on first inoculation, but no adaptation by serial passage was obtained. When the lungs of normal cotton rats or of animals which developed no lesions after inoculation of sputum were passed serially, the results were uniformly negative.

The lung lesions were patchy red-gray with maximum intensity at 6 to 8 days. Microscopic examination of sections of lungs showed an infiltration of the septa with polymorphonuclear leucocytes and mononuclear cells and hyperplasia of the alveolar epithelium. No inclusion bodies, elementary bodies, rickettsiae or visible microorganisms were seen in sections or in impression smears stained by the methods of Gram, Giemsa or Macchiavello. Cultures on blood agar and horse serum broth were negative. In 2 out of 6 filtration experiments using Berkefeld N candles passage of the agent was demonstrated.

Strains which had been adapted to cotton rats produced lung lesions after intranasal inoculation of Syrian hamsters (*Cricetus auratus*), but caused no detectable disease in mice, rabbits or guinea pigs. Animals which had recovered (in about 14 days) from intranasal inoculation of the pneumonia agent were solidly immune to reinoculation by the same route. Infected cotton rat lung produced neither illness nor

¹ The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of The Rockefeller Foundation in cooperation with the California State Department of Public Health. Most of the material for laboratory studies was obtained through the courtesy of physicians at the Medical Center and the Cowell Memorial Hospital of the University of California.

² For literature review and references see J. H. Dingle and M. Finland, *New England Journal of Medicine*, 227: 378, 1942.