R. P. Hall with his contribution did a real pioneer service summarizing the few available research data on "Growth-Factors for Protozoa." Here is a field which undoubtedly will receive more attention in the years to come.

G. R. Minot and M. B. Strauss in their masterly contribution on the "Physiology of Anti-Pernicious Anemia Material" were able to draw from rich experimental and clinical material of past studies.

In his chapter on "The Significance of the Vitamin Content of Tissues," R. J. Williams introduces the interesting problem of vitamin distribution. Special emphasis is laid on the significance of such distribution with regard to the functioning of the respective vitamins and also to the correlation with respiratory activity of tissues. More data have to be collected before generalization can be made.

The last contribution to be reviewed is that of G. Wald on "The Photoreceptor Function of the Carotenoids and Vitamins A." It is one of the outstanding chapters in the volume and its study should be highly recommended. It gives a lucid, logical exposition of all the available findings as gathered mainly from the research of the author. His conclusion, based on comparative physiology of photoreception, is that all photosynthetic cells appear to contain carotenoids, beginning from carotenes, xanthophylls, through astaxanthin in protistan phototaxis to vitamin A_2 (in fresh-water vertebrates) and finally to vitamin A_1 with active and determining participation in the primary processes of photoreception.

The volume contains a complete and useful subject and author index in addition to the bibliographic references attached to each chapter. (The latter are not handled with complete uniformity throughout the volume).

Workers in the fields of vitamins and hormones will gratefully acknowledge the present first volume of "Vitamins and Hormones" and will wish to the editors, to their contributors and to the publishers success for the future.

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ORGANIC CHEMISTRY

Electronic Interpretations of Organic Chemistry. By ARTHUR EDWARD REMICK. v + 474 pp. 19 figs. 13.8 × 21cm. New York, N. Y.: John Wiley and Sons, Inc. 1943. $4.50.

THE purposes of the book, as stated in the preface, are to review the contributions of physical chemistry to the theory and practice of organic reactions and to teach the organic chemist how to apply the new knowledge in attacking his problems. The task of relating physical properties with structure is not undertaken.

The first four chapters trace the historical development of the electronic concept of chemical bonds and reactions, emphasis being placed on aspects of interest to organic chemists. The long chapter V outlining the electronic theory of the English school of organic chemists contains a clear exposition of the many principles developed for the explanation and prediction of the course of organic reactions. In the sixth chapter the nature of resonance and its significance to organic chemistry is presented with acknowledged indebtedness to Pauling's "Nature of the Chemical Bond." Chapter VII, concerned with contributions of kinetics to organic reactions, describes the Eyring-Polanyi transition-state theory of reactions, Hammett's work on the importance of the entropy factor in the rates of organic reactions and Remick's thermodynamic prediction of reaction mechanism and rates. There follows a chapter on electrochemical studies of organic oxidation-reduction reactions. Chapter IX discusses the characteristics of electron-pairing reactions (a new term for reactions involving free radical intermediates), and a thermodynamic method for estimating quantitatively the products formed. In the penultimate chapter the quantitative and qualitative effect of solvent changes on the thermodynamic possibility and kinetics of organic reactions is elucidated, leaving little doubt of the importance of these matters to organic chemists. The last chapter, brief for one dealing with displacement reactions, reviews the mechanisms of hydrolysis of alkyl halides and carboxylic esters, elimination reactions and olefin addition reactions.

By title and content this book has been written for the large number of organic chemists who desire a working knowledge of modern theories of organic chemistry. Realizing that the complexity of organic molecules makes the application of qualitatively valid concepts of wider use than quantitative estimations, Professor Remick has been careful to designate fundamental principles by number and to summarize them conveniently at the end of the book. These principles are simple to learn but present difficulty in application, overcome only by practice and study of many examples. While the number of examples is greater than that found in the other books on theoretical organic chemistry, the reviewer feels that the progress of an initiate will be impeded by the comparative paucity and simplicity of the examples. Furthermore, the majority of illustrations exemplify the old English idea of mesomerism or electromeric shift. Subsequent discussion of the nature, advan-

tages and applications of resonance is inadequately illustrated, and does not replace the idea of mesomerism by the more general conceptual scheme of resonance.

Somewhat surprising is the omission of the few principles delineating the characteristics and generalizing the behavior of carbonium ion intermediates. Some of the reactions, intelligent understanding of which is made difficult by the omission, are the Wagner-Meerwein rearrangement, the reaction of diazomethane with ketones, the reaction of nitrous acid with primary amines and the Friedel-Crafts reaction. Among other important topics not treated is the work of Lucas and Winstein in which they produce convincing evidence for the bromonium ion intermediate, important in the displacement reaction and mechanism of addition to olefins.

There is at present no single book fulfilling the requirement of organic chemists and since many subjects are well discussed and comprehensively reviewed in Professor Remick's book alone, it is another work of circumscribed organic applicability which will be useful for chemists seriously interested in studying modern theories of organic chemistry.

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REPORTS

WARTIME HEALTH AND EDUCATION[1]

THE decisive contribution of science and technology to the winning of the war is recognized by all. The maximum contribution of science is equally essential in the postwar development of America. A nation free from fear and free from want, a nation which guarantees to its citizens a Bill of Economic Rights, is possible only with continued scientific research and development.

Scientific workers are as widely varied in economic status as the workers in any other field. The term "scientist" describes the $25,000-a-year director of an industrial laboratory as well as the $1,500-a-year laboratory worker in a hospital or school. There has been great variability moreover in wartime changes in the salaries of scientists. Many workers in the field of physics have left their jobs to go into war work, often at a considerably higher salary. But in government and academic science, particularly in the biological branches, scientists have in most cases remained at their pre-war positions, with rigidly fixed pre-war salaries.

It is unfortunate that no adequate data are available on the economic status of scientists; but from the meager information at hand, one can safely conclude that large numbers of American scientists are receiving salaries in the neighborhood of $150–$200 a month, or between $35 and $50 a week.

Even where salaries have increased in the course of the present war, they have been largely offset by increased taxation and the rise in the cost of living. All scientists—not only those in the lower income groups—have a great stake in the quick institution of the complete stabilization program proposed by President Roosevelt. Unless the current trend to inflation is halted, the scientist, along with all other professionals, will be faced with a serious situation which is bound to reduce the effectiveness of his contribution to the nation.

A wartime problem which many scientists face is that of the difficult living conditions in "war-boom" communities. Many scientists from distant parts of the country have been brought to communities where living costs have risen far more than for the country as a whole and where housing facilities are wholly inadequate to meet the new demands.

Scientists, perhaps more than most professional and white collar workers, are involved in war work for which they are paid, directly or indirectly by the Federal Government through such agencies as the Office of Scientific Research and Development and the National Defense Research Council. Unless a proper plan of action is followed by the Federal Government in turning from the wartime to a peacetime economy, there will be disastrous economic dislocations among scientific workers after the war. This would be both a personal and national calamity. As has already been indicated, the maximum contribution of all scientists is as essential to the welfare of the people after victory as it is now.

The American Association of Scientific Workers suggests the following steps, which would help to avert such economic dislocation:

(1) Continuation and expansion of governmental financing of scientific research, through subsidies to universities and other academic institutions as well as through the expansion of the government's scientific and technical agencies. Only by such governmental action can the full scientific skills developed during the course of the war be used.

(2) Continue the activities of the National Roster of Scientific and Specialized Personnel, with increased possibilities of functioning in a broader way, in the selection and placement of scientific personnel after the war.

(3) Those scientists who have left their homes to do

[1] Summary of statement presented to Senate Sub-committee on Wartime Health and Education on January 27, 1944, by Dr. Kirtley F. Mather, president of the American Association of Scientific Workers.