not to have changes made in his work without his permission.

In his letter of January 21, 1944, E. H. McClelland ignores Dr. Boyd's reasoning and supports his objection to Dr. Boyd's position solely by the statement that "equine serum" is exact and can not be misunderstood, whereas "horse serum" might be interpreted to mean a number of different things.

According to the definition, given in Webster's New International Dictionary, of "equine" when used as an adjective, "equine serum" might mean "serum of a horse," "serum pertaining to a horse," or, God save the mark, "serum resembling a horse."

Incidentally, what would Mr. McClelland prefer to corn whisky?

ROBERT J. LAWTHERS

BOSTON, MASS.

AN article appeared in SCIENCE (January 21, 1944) written by E. H. McClelland, in which he justified the change made by the editor of some journal in a manuscript of Dr. William C. Boyd. Dr. Boyd objected to the change from "horse serum" to "equine serum." Mr. McClelland laments the omission of connectives in English speech which results in nouns modifying nouns and believes this practice is a serious factor in the impairment of the English language. He claims that the change from "horse serum" to "equine serum" not only elevates the words from the dismal category of bad English, but also restores them to the realm of clarity from that of ambiguity.

As grammar is the basis of correct speech, we violate one of its rules by permitting a noun to modify a noun. But since the pattern of language is subject to evolution, is there any reason why a noun may not transmigrate to an adjective?

And as for ambiguity even the dictionary does not claim that "equine" will define serum any more rigorously than "horse," for in Funk and Wagnalls' "New Standard Dicitionary" (unabridged) "equine" means "of, pertaining to, or like a horse," so one has still to make a choice to suit the context.

Also in that dictionary "horse" has done very well as an abortive noun and gallops over more than a page (!) as an adjective.

Perhaps the answer to all the argument is to confer on "horse" a new degree and give him his A.D.J. It is noteworthy that "human" has done as much for himself, so why not bestow a similar honor upon this other noble animal?

All of which may merely serve to evoke equine cachinnations.

ANN O. EDISON

WEST ORANGE, N. J.

IN the discussion of editorial changes in scientific papers started by Dr. William Boyd[1] and continued by E. H. McClelland[2] there is one topic of importance that is hinted at but, it seems to us, not sufficiently emphasized. Leaving aside the merits of the point principally at issue, the use of substantives to modify nouns, we have the question of authorship and responsibility. Is the author responsible for the language employed in the paper, or is the editor responsible? When the reader detects inaccurate statements or faulty grammar in a paper, should he blame the author or should he blame the editor? The position often taken, that the author should determine the content of the paper and the editor the form, is not tenable. Every scientist well knows that the alteration of a single word or the misplacing of a single comma may totally change the meaning of a sentence. There can be no satisfactory division of responsibility unless the editor is willing to make himself the joint author of every paper.

It appears that friction between editors and authors could be avoided if they would govern themselves by the following principles. No editorial alterations, however trifling, shall be made without the consent of of the author. Consent may be given verbally, or by initialing a proof. If the author is furnished with a proof that is not in exact agreement with the copy he shall be privileged to approve it, to insist that it be made to agree with the copy or to withdraw the paper. But if the proof is typographically correct and in exact agreement with the copy, the author shall be bound to approve it without change, if the editor insists.

G. M. CLEMENCE
PAUL HERGET

U. S. NAVAL OBSERVATORY

SCIENTIFIC BOOKS

VITAMINS AND HORMONES

Vitamins and Hormones. Advances in Research and Applications. Edited by ROBERT S. HARRIS and KENNETH V. THIMANN. Volume I. With a foreword by E. V. MCCOLLUM. 1943. New York: Academic Press, Inc., Publishers. Price, $6.50.

THE present volume of "Vitamins and Hormones" constitutes the beginning of a new periodic publication and is planned to be the first of a succession of yearly volumes, which—in the words of the editors—

[1] SCIENCE, August 27, 1943.
[2] SCIENCE, January 21, 1944.

"will chronicle progress and point the way to new achievements." In his foreword Professor E. V. McCollum rightly points out "that the time is ripe for the founding of such a venture, since it is no longer possible for any one to read sufficient of the current papers and the library files dealing with these two classes of substances to assimilate all the knowledge which has accumulated."

Whereas the "Annual Review of Biochemistry" brings only reviews limited more or less to the publications of one year, giving a very comprehensive picture of this one year's work with the inclusion of vitamins and hormones, the present publication "Vitamins and Hormones" endeavors to interpret the records of many years in their relation to a few special problems. Thus the limitation lies here not in the time element but in the selection of the subjects to be incorporated in the current volume.

The high biological activity is the most conspicuous common link between vitamins and hormones. Hormones as endocrine products contribute in a large, even decisive manner to determining constitutional reactions, within physiological or pathological range. Vitamins introduced in the body with the food have a similar capacity in many respects. Here is a future possible field of research, the opening of which might be facilitated through the intermediary of "Vitamins and Hormones."

In the present first volume the scale is tipped rather in favor of vitamins. Of ten chapters two and part of a third contribution deal with hormones. The extraordinary achievements of the last 10 to 15 years in the chemical research of sex hormones are representatively reviewed by G. Pincus and W. H. Pearlman who wrote on "The Intermediate Metabolism of the Sex Hormones" and by T. Reichstein and C. W. Shoppee, whose subject is "The Hormones of the Adrenal Cortex" with special reference to the chemistry of cortical steroids. Pincus and Pearlman discussed the chemical reactions and transformations of the sex hormones in the body and *in vitro*.

"Physical Methods for the Identification and Assay of Vitamins and Hormones" is the title of the chapter written by J. R. Loofbourow. Spectrophotometry, colorimetry and fluorophotometry are described, analyzed and critically compared. For isolation, identification of the substances in quest, for determination of their purity the spectrophotometric method has its advantage. For assay procedures, so far vitamin A, α- and β-carotene and especially for esterone and androsterone colorimetric methods are just as good or even better than spectrophotometry. In the case of thiamine and riboflavin, fluorophotometry is by far the most sensitive of the assay methods.

The first chapter in the volume was written by C. C. Lucas and C. H. Best. Perhaps on account of his special and therefore biased interest in the subject, the present reviewer feels that this report is in almost every respect beyond possible criticism and was the best possible selection as an introductory contribution. Lucas and Best give a concise, clear and objective résumé of various problems connected with choline as a dietary factor. Choline "should take its place with the other members of the B complex from which it can not now legitimately be separated in any complete consideration of metabolic changes." The interrelation of choline, methionine and cystine is discussed by Lucas and Best in great detail, with special reference to the phenomenon of transmethylation (and dimethylation) as first formulated by du Vigneaud and his group. The questions whether choline and methionine are the only effective lipotropic factors, and whether the lipotropic activity of a protein is sufficiently determined by its relative content of methionine and cystine are left open. With Griffith the anti-lipotropic activity of cystine is considered by Lucas and Best as probably non-specific and due to the raising of the metabolism nearer to the normal level thus resulting in an increased demand for lipotropic factors. The present reviewer is not in agreement with this assumption and is in favor of assigning to cystine a specific role not only with regard to its anti-lipotropic activity but especially with regard to the experimental finding that whereas cystine alone is anti-lipotropic and promotes hepatic injury (necrosis and especially cirrhosis), given in combination with choline it is more beneficial than choline is alone. These and similar problems are now in the center of research activities. Workers engaged in this field should not miss the close study of the excellent report of Lucas and Best.

"The Appraisal of Nutritional States" is reviewed from the point of view of a clinician by N. Jolliffe and R. M. Most. Evidence for the prevalence of malnutrition is adduced from mortality statistics, morbidity rates, dietary surveys and from food supplementation. Under the factors contributing to nutritional failure the most important are intercurrent illnesses of great variety. The recognition of nutritional inadequacy is based on dietary, medical history and on the results of special examinations, using purely clinical and laboratory methods.

The title of the chapter, "The Chemical and Physiological Relationship Between Vitamins and Amino Acids," written by H. H. Mitchell is misleading. This report deals not only with amino acids but also with amino acid derivatives and with proteins as "amino acid aggregates." In consequence, the territory to be covered is too far extended and the views given are seen more from a distance than in their details.

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.

PAUL GYÖRGY

BABIES AND CHILDRENS HOSPITAL AND THE DEPARTMENT OF PEDIATRICS, SCHOOL OF MEDICINE, WESTERN RESERVE UNIVERSITY

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-