Journal of the American Medical Association,[7] the term "hypertensine" does not follow North American practice in that its selection evidently is intended to imply its causal relationship to hypertension, a relationship which has not been completely established. Further, the term "urohypertensine" has been used to denote a pressor substance in urine which in all probability had nothing to do with hypertension.

Meanwhile, we had retained the non-committal term "renin-activator" and used it without particular reference to its enzymatic rôle, since it was desired to avoid solidifying concepts and terminology in advance of full and complete evidence of the nature and function of this substance. Plentl and Page[8] have now by kinetic analysis established beyond a doubt the enzymatic nature of the interaction of renin with a protein substrate, the so-called "renin-activator," and Plentl, Page and Davis[9] have gone on to show that this substance is identical with or moves with the same electrophoretic mobility as α_2-globulin. Even with this background of evidence, the otherwise attractive term "hypertensinogen" should not be adopted since, as noted above, the term "hypertensine" is unsatisfactory. Further, the suffix "-ogen" in enzyme chemistry usually refers to a mother substance which, by a molecular rearrangement, gives rise to another substance, often itself an enzyme, *e.g.*, pepsinogen, trypsinogen, etc.

Since it now seems desirable to discard the term "renin-activator" and since the evidence is at hand to substantiate the implications of the terminology, we suggest that the purely descriptive word "renin-substrate" be applied to this substance and that, when it is considered useful to indicate its presence in, or identity with, the protein fraction α_2-globulin, this be added as postscript and the term written "renin-substrate (α_2-globulin)."

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SCIENTIFIC BOOKS

THREE MATHEMATICAL TEXT-BOOKS

Aircraft Mathematics. By S. A. WALLING and J. C. HILL. 189 pp. Cambridge: The University Press; New York: The Macmillan Company. 1942. $1.25.

Principles of College Algebra. By M. S. KNEBELMAN and T. Y. THOMAS. x + 380 pp. New York: Prentice-Hall, Inc. 1942. $2.50.

Differential Equations. By R. P. AGNEW. vii + 341 pp. New York: McGraw-Hill Book Company, Inc. 1942. $3.00.

THESE three books deal with essentially distinct domains of mathematical instruction, both as to the material included and the degree of mathematical knowledge presupposed. They have one important point in common, however. They aim at a genuine comprehension of the material covered rather than a mere training in the formal use of it. Having been written by highly competent teachers of mathematics, with a secure mastery of their subject, they are well adapted to the realization of this aim.

The first book covers material within the range of any properly trained first-year high-school student. In fact, since about a third of the book is devoted to arithmetic, some of the material should be review work for such a student. The other subjects treated may be classified as algebra, geometry and trigonometry, with numerical trigonometry and the use of logarithms in computation marking the upper limit of advancement. The book is frankly intended for the present emergency and selects such elements of mathematical theory and application as are essential for those entering on training for the Air Corps. However, the material is well integrated and arranged in order of logical development. The problems are well selected and pertinent to the aim of the book. Altogether, the authors have done an excellent job.

The second book is primarily suitable for a freshman or sophomore in college, though much of it would be valuable for a junior or senior student who had not previously received a good training in algebra. In view of the recent tendency to cut short the mathematical instruction in high school, and in college to get on as rapidly as possible to the elements of the calculus, there has been a neglect of the domain known generally as college algebra. On account of the importance of algebraic theory in many of the recent developments of theoretical physics, such a lacuna in mathematical training has become increasingly disadvantageous. The inclusion of a course dealing with the material of the book under review is thus seen as highly desirable in a proper scheme of mathematical education.

Professors Knebelman and Thomas have included all the classical topics of college algebra in their book and have given an unusually careful discussion of these. Other topics, not so generally treated, such as

[7] Editorial, *Jour. Am. Med. Asn.*, 120: 923–924, November 21, 1942.

[8] A. A. Plentl and I. H. Page, *Jour. Biol. Chem.*, 147: 135, 1943.

[9] A. A. Plentl, I. H. Page and W. W. Davis, *Jour. Biol. Chem.*, 147: 143, 1943.

matrices and linear dependence, are also included. On the whole, the book is thoroughly modern and pedagogically excellent. It is a valuable addition to available books in the field.

The third book falls in a somewhat more advanced field, being suitable for a junior or senior in college or a first-year graduate student who has had no systematic training in differential equations. A special effort has been made by the author to avoid mere formalism and to see that the student gets at the heart of the matter. This effort will undoubtedly be amply justified in the way of increased understanding on the part of students who make use of the book. The fundamental notions and theorems of analysis that have special significance in discussing the solutions of differential equations, such as the Riemann definition of the integral, the varied behavior of functions as to continuity and existence of derivatives, the widening of a class of functions by considering indefinite integrals of such functions, are introduced early in the book and effectively used thereafter. The choice of problems is excellent, and many of them furnish a good introduction to important applications of the theory.

A valuable feature of the book is the excellent discussion of Picard's method of successive approximations, both as a method of solving equations and as a means for proving existence theorems. This discussion includes the treatment of equations of higher order and of systems of equations. It rounds out in excellent fashion the theoretical side of the work.

From every point of view Professor Agnew's book is a noteworthy addition to available texts for an introductory course in differential equations. Its appearance will be welcomed by those who have occasion to conduct such a course and by students who need to pursue the subject on their own initiative.

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BIOCHEMISTRY AND MORPHOGENESIS

Biochemistry and Morphogenesis. By JOSEPH NEEDHAM. 785 pages. Cambridge: At The University Press. New York: The Macmillan Company. 1942.

ALTHOUGH this book is not a continuation of Dr. Needham's classical work in three volumes on "Chemical Embryology," published in 1931, it is a timely and worthy successor, still concerned with the relation between morphology and chemistry. There are many references back to the earlier work in lieu of repetition, and the present book includes within its treatment most of the advances in the field of chemical embryology that have occurred since 1931. It thus serves as a sequel to bring that subject up to date. It does more than this, however. The present book goes well beyond a descriptive account of the biochemistry of the developing embryo; it goes about as far as the present state of knowledge permits in attempting to analyze the causal aspects of morphogenesis by explaining the unknown in terms of the known or better known, including specific substances when possible. In effect, an integration of chemical embryology and experimental embryology is attempted, which means a meeting on common ground of biochemistry and morphology.

Since the beginning of the present century, and even earlier, it has been shown repeatedly by amputation, transplantation and other types of experiments on many kinds of embryos (and regenerating adults) that the developmental fate of a part of the egg or embryo may be profoundly affected by its physical proximity and relation to other parts. This dependence in differentiation has in many instances been taken to imply the existence of morphogenetic hormones. Morphogenetic hormones have indeed also been found in plants, in which they have in certain cases been more quickly and more readily identified than in animals. The influence of one part of an animal embryo on another is strikingly shown in the "inducing" or "organizer" action of the cells of the dorsal lip of the vertebrate blastopore, which impose the main primary pattern of differentiation of the embryo upon neighboring cells with which they come in contact. In 1931 Spemann demonstrated that destroying the living integrity of such cells by crushing had little or no effect upon their inducing activity, and Holtfreter and others soon found that the inducing activity survived boiling, which destroys enzymes. These far-reaching experiments banished the last remnants of any basis for the mysticism still occasionally associated with the inductor agencies and stimulated intensive attempts both to isolate inductor substances, in which Dr. Needham himself took the lead, and to further understand their action. Substances of known composition were found that possess inducing activity, although it is not yet certain whether they are the same agents that act naturally or whether they stimulate or release the natural agents.

The second and longest part of the book is devoted to a comprehensive and penetrating consideration of morphogenetic stimuli and their actions. There is clear recognition of the great rôle of the reacting systems that respond to the stimuli in ways not yet clearly understood. The account shows that great advances have been made and that many more are yet to be expected. It also reveals the great intricacy and complexity of the processes of development that have for so long intrigued, baffled and fascinated the mind of man.

In Part 1 the morphogenetic substratum is consid-