and who are concerned with problems of "purity" and homogeneity of substances. Every section concludes with an ample bibliography, so that the book serves as an excellent guide to the basic literature of immunochemistry.

With due respect to the present controversy over the terms serology, immunochemistry, and immunology, *Experimental immunochemistry* by Drs. Kabat and Mayer is a book every worker in these fields should have.

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The hormones: physiology, chemistry and applications. (Vol. 1.) Gregory Pincus and Kenneth V. Thimann. (Eds.) New York: Academic Press, 1948. Pp. xi + 886. (Illustrated.) $13.50.

The hormones is a work designed for the serious student of general biochemistry and physiology. This volume and its forthcoming companion are intended to provide a well-organized and critical description of the chemistry, physiology, and applications of the hormones.

We are in this book treated to a "stock-taking," by experts in their respective studies, of the hormones of plants, insects, and invertebrates. There are excellent discussions of the parathyroid and the gastrointestinal hormones, a somewhat less thoroughgoing treatment of the pancreas, and a very good chapter on the recognized hormones of the anterior pituitary. More than 300 of the nearly 800 pages of text are occupied by accounts of the chemistry and metabolism of the various steroid hormones. (The biology of these hormones, as well as those of the pituitary, will be treated in Volume II.)

Two final chapters, by Folley and Malpress, furnish a most competent guide to the labyrinthine ways of mammary gland development and the control of lactation. From the book as a whole and these last chapters in particular, two essentials to rapid progress in endocrinology are made clear. The first is the need for developing accurate and specific methods of assay. The second is the need for pure hormones in amounts adequate for detailed and extensive study. On the whole, this volume sets a high standard and fulfills its purpose. It is well printed and illustrated, and thoroughly indexed, and its 3,441 references will be invaluable to the student. The editors are to be congratulated both upon their selection of contributors and upon the realization of a needed, useful work.

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The chemistry of penicillin. Hans T. Clarke, John R. Johnson, and Sir Robert Robinson. (Editorial Board.) Princeton, N. J.: Princeton Univ. Press; London: Geoffrey Cumberlege, Oxford Univ. Press, 1949. Pp. x + 1094. (Illustrated.) $36.00.

This book records in detail the results of experimental and theoretical studies carried out by a group of American and British chemists, under the joint sponsorship of the U. S. Office of Scientific Research and Development and the Medical Research Council, London, to determine the chemical constitution and structure of penicillin and to devise synthetic methods for its production. The material published was compiled under the auspices of the National Academy of Sciences, Washington, D. C., under contract with the OSRD and is presented under the following 29 chapters: Brief History of the Chemical Study of Penicillin, by Hans T. Clarke, John R. Johnson, and Robert Robinson; The Earlier Investigations relating to 2-Pentenylpenicillin, by E. P. Abraham, W. Baker, W. R. Boon, C. T. Calam, H. C. Carrington, E. Chain, H. W. Florey, G. G. Freeman, R. Robinson, and A. G. Sanders; The Chemistry of n-Amylpenicillin up to December 1943, by A. H. Cook, and I. M. Heilbron; Status of the Research on the Structure of Benzylpenicillin in December 1943, by Robert L. Peck, and Karl Folkers; Isolation and Characterization of the Various Penicillins, by O. Wintersteiner, W. R. Boon, H. C. Carrington, D. W. MacCorquodale, F. H. Stodola, J. L. Wachtel, R. D. Coghill, W. C. Risser, J. E. Philip, and O. Touster; Penillic Acids and Penillamines, by A. H. Cook; Review of Certain Investigations on the Structure of Benzylpenicillin during 1944–1945, by Robert L. Peck, and Karl Folkers; Some Inactivation and Degradation Reactions of Penicillin, by O. Wintersteiner, H. E. Stavely, J. D. Dutcher, and M. S. Spielman; Desthiobenzylpenicillin and Other Hydrogenolysis Products of Benzylpenicillin, by Edward Kaczka, and Karl Folkers; The Thiocyanate Derivative of Benzylpenicillin Methyl Ester, by Vincent du Vigneaud, and Donald B. Melville; The X-Ray Crystallographic Investigation of the Structure of Penicillin, by D. Crowfoot, C. W. Bunn, B. W. Rogers-Low, and A. Turner-Jones; Identification and Crystallography of Penicillins and Related Compounds by X-Ray Diffraction Methods, by G. L. Clark, W. I. Kaye, K. J. Pipenberg, and N. C. Schieltz; Infrared Spectroscopic Studies on the Structure of Penicillin, by H. W. Thompson, R. R. Brattain, H. M. Randall, and R. S. Rasmussen; Other Physical Methods, by R. B. Woodward, A. Neuberger, and N. R. Trenner; The Constitution of Penicillins, by John R. Johnson, Robert B. Woodward, and Robert Robinson; Penicillamine, Its Analogs and Homologs, by Harry M. Crooks; Penilloaldehydes and Penaldic Acids, by Ellis V. Brown; The Penilloic and Penicilloic Acids and Their Derivatives and Analogs, by Ralph Mozingo, and Karl Folkers; Biosynthesis of Penicillins, by Otto K. Behrens; Chemical Modifications of Natural Penicillins, by R. D. Coghill, F. H. Stodola, and J. L. Wachtel; Oxazoles and Oxazolones, by J. W. Cornforth; Attempted Syntheses of Penicillins, by W. E. Bachmann, and M. W. Cronyn; The Condensation of Oxazolones and D-Penicillamine and the Resultant Antibiotic Activity, by V. du Vigneaud, J. L. Wood, and M. E. Wright; Methyl Benzylpseudopenicillinate, by J. H. Hunter, J. W. Hinman, and H. E. Carter; Thiazolidines, by A. H. Cook, and I. M. Heilbron; The Chemistry of β-Lactams, by S. A. Ballard, D. S. Melstrom, and C. W. Smith; The γ-Lactam of Benzylhomopenicilloic Acid and Related Compounds, by Vincent du Vigneaud and Frederick H. Carpenter; Synthetic Benzylpenicillin, by Vincent du Vigneaud, Frederick H. Carpenter, Robert W. Holley, Arthur H. Livermore, and Julian R. Rachele; Assay of Penicillins, by John V. Scudi, and H. B. Woodruff. There is also an appendix and an index.

During the past three years chemists have looked forward with great expectation to the appearance of this monograph, in which for the first time there would be presented in its entirety a description of the work connected with one of the important war projects, namely, the determination of the structure of the antibiotic peni-