a group of papers outstanding in their variety, which present an excellent picture of the field of psychopharmacology at the time the symposium took place.

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Biochemistry and Human Metabolism. Burnham S. Walker, William C. Boyd, and Isaac Asimov. Williams and Wilkins, Baltimore, Md., ed. 3, 1957. vii + 896 pp. $12.

The third edition of this excellent textbook of human biochemistry incorporates expanded treatment of such topics as the high-energy acyl-mercaptan bond in metabolism, the abnormal hemoglobins, the sodium pump theory of membrane potentials, and the carbon cycle in photosynthesis. The "Tissue chemistry" and "Enzymes" chapters of earlier editions have been subdivided into four chapters, entitled "Carbohydrates and lipids," "Tissue chemistry," "Enzymes and coenzymes," and "Enzyme systems." This last chapter includes a section on thermodynamics.

This edition retains the unique arrangement of subject matter and the excellent chapter on reproduction and heredity of the first and second editions.

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From the Closed World to the Infinite Universe. Alexandre Koyré. Johns Hopkins Press, Baltimore, Md., 1957. xii + 313 pp. Illus. + plate. $5.

Few episodes in the evolution of scientific ideas have been so neglected by historians as the 17th century's infinite expansion of the Aristotelian and early Copernican cosmos. The reasons for the neglect are clear. Since the 17th century produced no evidence for the infinite universe, men like Descartes and Newton could have abandoned the finite cosmos of Copernicus and Kepler only on speculative philosophical grounds. The historian of science has, however, normally spurned speculative philosophy while his colleague in philosophy has shied from the nonmethodological parts of science. As a result, the 17th-century transition "From the Closed World to the Infinite Universe" has, until this recent study by Alexandre Koyré, fallen between two institutionalized areas of scholarship.

Koyré's essay, particularly if it is taken in conjunction with his earlier fundamental contributions to the immediate prehistory of Newtonian dynamics, demonstrates how unfortunate the almost standard neglect of the borderlines between science and philosophy has been. Whether speculative or not, creative concern with the physically infinite proves to have been one of the universally creative elements in 17th-century thought. In his *Etudes Galiléennes,* Koyré graphically described its fruitful impact upon the formulation of physical problems, emphasizing, for example, its role in the transformation of Galileo's limited principle of inertia into the now familiar Cartesian-Newtonian form. In the present study he turns to the infinite universe itself, discussing first its 16th-century roots and then its effects upon the development of 17th-century philosophy and theology. The subject directs Koyré to many of the period's most fascinating figures. In his first four chapters Nicholas of Cusa, Palingenius, Copernicus, Digges, Bruno, Gilbert, Kepler, Galileo, and Descartes debate the finitude of the universe. In the remaining eight, Henry More, Malebranche, Newton, Bentley, Raphson, Berkeley, Clarke, and Leibnitz discuss the implications of physical infinity for the conceptions of space, force, and Deity and for other concepts besides.

Since Koyré's expository technique is *explication des textes* (perhaps a third of his volume is quotations), the penetrating perceptions that are his own characteristic contribution defy summarization. One of them must serve as example for the whole. In both the Aristotelian and early Copernican cosmos, God's throne had been beyond the outermost sphere. In the infinite universe of Descartes and Newton, there could be no such location; therefore, only an immanent Deity could preserve continuing contact with his creation. As a result, one persistent tendency of 17th-century thought was the identification of God with space or with space-filling fluid. During the century, the previously mystical and incommunicable vision of a Neoplatonic *anima mundi* increasingly became a necessity of rational natural theology.

Readers of Koyré's book can find for themselves many other analyses of equal interest. They may question a few of these. (Should any treatment of the transition to an infinite universe pay so little attention to the revival of atomism? Did Newton reject mechanism so explicitly or unequivocally as Koyré believes?) But these questions will concern details, minor in a volume that makes a new area of study accessible to a new group of readers. The word *accessible,* however, raises a more important problem, about which a word of warning may be in order. The lucid colloquial style which makes this book so pleasant to read often combines with the intrinsic limitations of exposition through quotation and commentary to disguise both the coherence and the significance of the topics treated. Koyré has provided the material and has illuminated it with uniformly perceptive and occasionally brilliant commentary. Yet both material and commentary sometimes seem too little controlled. It will take careful readers or ones with more than average background to isolate and follow the conceptual threads that make this volume an important contribution to the study of 17th-century thought.

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The Chemistry of Plants. Erston V. Miller, Reinhold, New York; Chapman & Hall, London, 1957. vii + 174 pp. Illus. $4.75.

There are many ways of organizing a discussion of the chemistry of plants. Erston Miller has chosen a classical and straightforward approach. Twelve successive chapters consider, successively, carbohydrates, proteins and other nitrogen compounds, lipides, plant pigments, enzymes, organic acids, plant hormones, glycosides, alkaloids, vitamins, the inorganic elements, and other miscellaneous plant products such as ethylene and various growth inhibitors. The discussion is an elementary one. Thus, chapter I on carbohydrates gives the reader a little elementary carbohydrate chemistry, a small catalog of the various carbohydrates which are found in plants, and a little physiology. This pattern is followed throughout the book, which then, as a whole, is long on classification of substances and on lists of occurrences of substances and very short on metabolism, on structure, on any feeling for the way in which chemical compounds are put together to make a living plant. In part, this is due to Miller's avowed intention to make his book a chemistry book and not a volume on plant physiology. But the attempt is not a wholly successful one. The phenomenology of the occurrence of compounds in plants is all very well, but there are so many compounds present in a plant that it leaves the reader bewildered. Coherence and clarity would have been contributed to the volume by more detailed consideration of the way in which compounds are biochemically related to one another, more detailed discussion of metabolic pathways, and more detailed discussion of the role of each material in the overall chemistry of the life process.

Although this book appears in 1957, much of the material in it is already outdated. There is, for example, no indication of the extent of our knowledge