places merely symbols for far-off regions, like the schoolboy's proverbial Asia Minor? Does not the extraordinarily vivid picture of the dog with rabies attacking a man deserve some comment and perhaps an inference as to its place of origin? These and other queries spring to mind as one turns over the pages. It would, however, be wholly unreasonable to concentrate on such insignificant details, when so much industry and expertise have gone into the making of this book. The final product is a consideralbe achievement for so young a scholar and gives promise of even better things. No small credit is due also to her supervisor, Professor Pächt, and to her publisher.

BRIGITTE HOPPE, *Biologie, Wissenschaft von der belebten Materie von der Antike zur Neuzeit* (Sudhoffs Archiv, Beiheft 17), Weisbaden, Steiner, 1976, 8vo, pp. ix, 368, DM. 75 (paperback).

Reviewed by Vivian Nutton, M.A., Ph.D., Wellcome Institute for the History of Medicine, 183 Euston Road, London NW1 2BP.

This complex study, a Munich *Habilitationschrift,* concentrates on two aspects of the history of biology and, especially, botany, the development of appropriate methods of enquiry and, second, theories of the material composition of organisms, from Aristotle to G. B. Treviranus at the beginning of the nineteenth century. Dr. Hoppe describes how the traditional classificatory systems of Aristotle and Theophrastus, which were based on specific differences between plants, came gradually to be replaced, in the works of Jungius and John Ray, by an emphasis on essential similarities. As in recent studies of sixteenth-century medicine, the humanist recovery of Greek technical treatises is seen as a stimulus to scientific discovery, although perhaps more might have been made of the various contributions of the Renaissance editors and commentators of ancient botanical works, such as Manardi, Ruelle, and Matthiolo.

An interest in classification and in proper method, since both depended largely upon logic, could be held to some degree independently of any practical investigations into the workings of living things. To reduce natural phenomena to an ordered system was an attainable task for the biologists of the sixteenth and seventeenth centuries: the investigation of plant metabolism, the subject of much of the book, was far more difficult and always encumbered by a multitude of unprovable, and often erroneous, hypotheses. The classical theory of Theophrastus, who believed in an interchange of three elements, earth, fire, and water, with their attendant qualities, the gradual removal of water within the plant through "cooking by its innate fire", and a series of minute natural substances as the product of metabolism, was highly influential in the Renaissance. The art of distillation to make the "quintessence" of a thing led at first to Costeo's identification in 1578 of the life-principle of a plant with its proper moisture, and later to a systematic analysis of plant-chemistry in the service of botany rather than pharmacology.

From the second half of the seventeenth century interest in plant metabolism focused on the functions of the vessels and cells within the plant, and, although experimenters like Stephen Hales might emphasize air as the life-principle and study

its properties, it was not until Treviranus that the study of the structure of plants and its significance for physiological functioning were investigated with a knowledge of chemistry and by experimental methods. But, as Dr. Hoppe shows, the fact that students of biology and botany were seeking to explain continuous processes meant that a static chemical and physical analysis was not always adequate and that biology, or biochemistry, was gradually forced to develop its own methodology and its own scientific norms and procedures.

This summary of the argument cannot do justice to the many careful insights contained in this book, which has all the virtues and few of the vices of a thesis. Dr. Hoppe's investigations will, it is hoped, provide a model for a study of the development of methods of enquiry into another living organism, man, for many of the authors she draws upon were perhaps even more concerned with the human body. Certainly few medical writers of the sixteenth and seventeenth centuries were unaware of the prime importance of the correct method of diagnosis and treatment, and it was not for nothing that John Caius regarded as his greatest medical achievement his reworking of Paduan orthodoxy, his own *Methodus medendi.* It may also be true that, as with botany, it was not until the alliance of chemistry, physiology, and medicine in the nineteenth century that significant progress was made in the understanding of the body and of disease. Such observations are prompted by the reading of this valuable and constructive book, whose complex argument well repays study.

ROBERT JOLY, *Hippocrate. Tome XIII. Des lieux dans l'homme; Du système des glandes; Des fistules; Des hémorrhoïdes; De la vision; Des chairs; De la dentition,* Paris, Les Belles Lettres, 1978, 8vo, pp. 234, 120 F.

Reviewed by Vivian Nutton, M.A., Ph.D., Wellcome Institute for the History of Medicine, 183 Euston Road, London NW1 2BP.

Professor Joly has once more put us in his debt by presenting further writings of "Hippocrates" in a new edition, with a lucid translation, accurate indexes, and generous discussion of many details, both medical and non-medical. His chosen texts, the important *Places in Man, Glands, Fistulae-Haemorrhoids, Vision, Fleshes* (if that is the correct wording), and *Dentition,* have all been neglected because they were thought to contain Cnidian rather than "Hippocratic" doctrine, a distinction which hampered the understanding of classical Greek medicine. Only *Dentition* finds a place in Jones's Loeb edition (and Joly rightly rebuts the idea that it formed part of an otherwise lost medical dictionary or encyclopaedia), and since Littré a century ago, only *Fleshes,* in 1935, has received a comprehensive modern edition.

As always, Joly shows himself sensitive to nuances of language and argument, and fair to those who favour different interpretations or who have anticipated his conjectures. A rare omission is a reference at p. 51, 20f. to the sixteenth-century Paduan professor, Mercurialis, who, in his *Variae Lectiones* II 8, Venice, 1570, uses a reading in a (lost?) manuscript to clarify the corrupt vulgate text.

This Budé Hippocrates bears ample testimony to the continuing vigour of French Hippocratic scholarship: the planned revival of the Loeb Hippocrates will do well to attain the high standards that Professor Joly has set.