work singling out the importance of Renaissance Hermeticism as a source of scientific values. The Hermetic philosophy of raising man's dignity by hailing his ability to discover magical powers, developed first in Italy, is shown to have been successively absorbed and transformed in England by Bacon, Boyle, and the Cambridge Platonists to meet the shifting requirements of 17th-century Protestantism. Rattansi's argument is complex and subtle and has the ring of truth about it. The effortless introduction into his story of the content of scientific theories is also a convincing argument for discarding the distinction between "external" and "internal" history of science which Mathias clings to in the introduction. The next speaker, A. R. Hall, seems to disagree with Mathias in his contribution, "Science, technology and Utopia in the seventeenth century," which turns on the separation between "internal" scientific progress and "external" technological change and literary expression. Both articles seem cogent despite their apparent contradiction on a higher plane.

In another useful essay, entitled "Who unbound Prometheus?," Mathias meticulously reviews the known links between scientific change and technological innovation in the 17th and 18th centuries, concluding that the role of scientific attitudes of rationalism, independence from tradition, experimentation, and accuracy were more significant for technology than was specific new knowledge uncovered by contemporary science. As if to offer a counter example, D. S. L. Cardwell argues in the next essay for the relevance of hydro and steam technologies to the concepts underlying thermodynamics. His exposition is too truncated to permit these relationships to be appreciated fully, but the reader is referred to a longer work by Cardwell for elaboration.

The last two articles are confined to topics strictly within England. On the basis of a few significant statistics from the York County Hospital, E. M. Sigsworth challenges the view that hospitals were "gateways to death" where diseases were caught and spread rather than checked and where surgery was often lethal. The evidence, sparse as it is, certainly calls for a reexamination of standard views. R. M. MacLeod's closing talk on "the endowment of science movement, 1868–1900" recounts an important phase in the gradual acceptance by government and society in Victorian England of the need to pay stipends to scientists for their occupation, rather than to award them medals and accolades after their work has proved significant. Failure to grasp this necessity was a serious block to developing research careers in science, hindering science from taking its legitimate place alongside other respectable professions. MacLeod's article, thoroughly steeped in untapped sources, demonstrates the possibilities of this approach for the study of science-society links.

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The Kidney

Developmental Nephrology. WALLACE W. MCCRORY. Harvard University Press, Cambridge, Mass., 1973. xiv, 216 pp. + plates. $12. A Commonwealth Fund Book.

This compact monograph is dedicated to the manifold processes involved in the structural and functional development of the human kidney. Quite properly, the focus is on the tubular units, nephrons, and collecting ducts. The review of their developmental history is conducted under five chapter headings: embryologic development, development of renal function in utero, quantitative measurement of renal function in infancy and childhood, renal function in the postnatal period, and cellular processes underlying growth and development.

The opening chapter describes human nephrogenesis in a setting of comparative mammalian nephrogenesis, both descriptive and analytical, and for its data and interpretations McCrory has relied heavily on Jean Oliver's 1968 monograph *Nephrons and Kidneys* (Hoeber). Included is a reproduction of nine plates of Oliver's exquisite reconstructions of microdissections of developing nephrons. As elsewhere throughout the monograph, attention is directed to important unresolved problems, in this instance (i) the mechanism of junction of nephrons and collecting ducts, (ii) formation of glomeruli, and (iii) the mechanism for segregation of the nephrons to the cortex and branches of the collecting system to the medulla.

The inaccessibility of the human fetus obviously accounts for the paucity of direct measurements of fetal renal function and related roles played by the placenta and amniotic fluid in water and solute exchange. Accordingly, any investigator is confronted with the uncertain validity of extrapolation of data derived from other mammals, notably the exteriorized sheep fetus. Chapter 2 assumes a cautious stance in this regard, to wit: "The reliance on data in other mammals for a description of the pattern of functional maturation of the kidney in man is obviously hazardous" (p. 77).

In contrast to the unknowns of embryonic and fetal life, the continuing structural and functional maturation of the kidney of infant and child is more directly documented. Chapters 3 and 4 summarize current understanding. Particularly interesting to this reviewer are the data, summarized in chapter 5, on developing cellular patterns of enzymes, nucleic acids, and structural proteins. Delineation of these patterns goes far toward revealing the mechanisms of compensatory hypertrophy following uninephrectomy.

McCrory not only has admirably synthesized current knowledge of the structural and functional development of the human excretory system but has submitted thoughtful and stimulating reappraisals of "concepts of the pathophysiology of many childhood renal diseases." Clinicians and researching embryologists and physiologists will find the monograph a valuable asset. A bibliography of just under 400 citations and a brief, but adequate, index round out this scholarly treatise.

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Meteorology

Atmospheric Energetics. JACQUES VAN MIEGHEM. Clarendon (Oxford University Press), New York, 1973. x, 306 pp., illus. $24. Oxford Monographs on Meteorology.

Measurements of meteorological quantities are practically all in some sort of time-averaged form, and meteorological problems can be approached appropriately only with the use of the governing equations in Reynolds form (time-averaged). Books on atmospheric dynamics, however, have mostly been written in the traditional line of approach, namely by the introduction or derivation of the governing equations and analysis and solution of these equations under various assump-