Book Reviews

An Autobiography

Memoirs of a Physicist in the Atomic Age. WALTER M. ELSASSER. Science History Publications (Neale Watson), New York, and Adam Hilger, Bristol, England, 1978. xii, 268 pp. + plates. $15.

Walter Elsasser, who was born in Germany in 1904, belongs to the generation of physicists who formulated quantum mechanics in the '20's, the generation of Heisenberg, Pauli, and Dirac. Although he has lived in this country since 1936 working on problems of atmospheric physics, geophysics, and theoretical biology—he is best known for his theory of the earth's magnetism—Elsasser has chosen to devote most of his *Memoirs* to his early years in Europe as an atomic and nuclear physicist. It was then that he came in contact with "an unusual number of the great and famous" as his studies took him from Heidelberg and Munich to Goettingen, where he worked with both James Franck and Max Born and received his doctorate in 1927. The next few years saw him in Leyden, Kharkov, Berlin, and Frankfurt. When the Nazis seized power in 1933 Elsasser, whose grandparents were all Jews, promptly left for Switzerland, and then was fortunate enough to find a position in Joliot's group in Paris, where he worked until he left for the United States.

The years Elsasser spent as student and beginning physicist before his move to France were neither very happy nor very successful, as he makes clear in his book. He had written a remarkable first paper in 1925, a short note showing that the matter waves recently proposed for different reasons by Einstein and Louis de Broglie could be used to explain some anomalous results in the electron scattering experiments of C. J. Davisson and C. H. Kunsman. Elsasser's note in *Die Naturwissenschaften* is the first work relating de Broglie's ideas to experiment. Unfortunately Elsasser was not in a position to follow up this brilliant start, and neither Franck nor Born offered any help in this direction.

Although Elsasser was at Goettingen from 1925 to 1927 he conveys no sense of excitement there as quantum mechanics was coming into being. It may well be that as a student he was not close enough to the principal figures to sense what was happening, or that Born chose not to share the drama of the time with his students, but surely that is itself worth Elsasser's comments in these *Memoirs* written 50 years later. At this point as at many others one misses both the details that might enliven and give immediacy to Elsasser's account of what happened then and also his reflections on what these experiences mean to him now. Despite his resolution "to record just what I succeeded in recalling and not to yield to a desire for elaboration," much of what we are told about the people he met is what could be found elsewhere. Of Erwin Schroedinger, who meant a great deal to Elsasser, he writes "I felt like a Boswell to this remarkable genius"; but he reports none of the characteristic conversation or actions of his Dr. Johnson.

Despite all its actual interest I have a sense of opportunities missed in this book. Elsasser's career was not just a passage from success to success. He won his way to academic security, scientific recognition, and personal peace more slowly than some and at greater expense to himself. For these reasons, and because of his own awareness of human complexity, one wishes he could have shared more of his real life with his readers. On those occasions when he does the result is rewarding. He describes a day in the fall of 1922 when Professor Philipp Lenard entered the large lecture room at Heidelberg to begin his course on general physics. Lenard was wearing a large silver swastika pinned to the breast of his "impeccably tailored suit," and was greeted by the tumultuous approval of the students who filled the hall. Elsasser's moving description of the devastating effect this incident had on him is an indication of what he might have given us in this book.

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Medical Mores

A Social History of Medicine. FREDERICK F. CARTWRIGHT. Longman, New York, 1977. viii, 210 pp. Cloth, $12.95; paper, $7.50. Themes in British Social History.

Health Care and Popular Medicine in Nineteenth Century England. Essays in the Social History of Medicine. JOHN WOODWARD and DAVID RICHARDS, Eds. Holmes and Meier, New York, 1977. 196 pp. $18.

These two small books provide valuable historical perspective on the relationship of medicine and society in England. Cartwright's well-written study is designed for the general reader. It is therefore not documented with the footnote apparatus of the professional historian, but it is authoritatively written, makes excellent use of contemporary sources to brighten the narrative, and includes reading lists giving some of the major secondary sources.

Cartwright opens with a very brief survey of changing ideas in the philosophy of medicine from the earliest times to the mid-19th century. This is followed by a short review of the care of the sick before 1800 and a section on the history of medical licensing. Separate chapters explore diseases that resulted in widespread mortality—bubonic plague, smallpox, and cholera. Cartwright believes that the end of the 300 years of plague in Europe in the mid-17th century was due to some natural process and cannot be attributed to any medical or scientific discovery, advance in social hygiene, or improved standard of life. Plague was replaced as the most dreaded disease in late-17th- and early-18th-century England by smallpox, in its lethal, variola major form.

In a composite chapter on alcohol, syphilis, and tuberculosis, Cartwright observes that these damaged the people of industrial Britain to an extent even greater than smallpox and cholera. He sees alcohol as becoming a major social problem in Britain only after the 17th century, with the development and popularization of distilled spirits. Noting that, despite widespread reform efforts, the first Licensing Act did not pass until 1904, Cartwright quotes the sentiments of the Bishop of Peterborough in an 1872 speech to the House of Lords: "If I must take my choice whether England should be free or sober, I declare, strange as such a declaration may sound coming from one of my profession, that I should say it would be better that England should be free than that England should be compulsorily sober." A final chapter

covering the introduction of the National Health Service in 1948 has space only for a few highlights, concluding with a resume of the problems posed for society and the individual by increasing longevity.

Although Cartwright occasionally touches upon international developments, the book focuses on England. It can be recommended as an attractively presented brief overview for the reader seeking some historical background on the role of medicine and disease in society.

In contrast, *Health Care and Popular Medicine in Nineteenth Century England* is a series of essays by a group of historians and sociologists that concentrate primarily on the relationships between medicine and society in the first part of the 19th century.

The editors' exploratory essay, "Towards a social history of medicine," constitutes about a fourth of the book. In it they urge a synthesis of historical and sociological perspectives with medicine and the use of medicine as a theme for the elaboration of historical and sociological knowledge. They then review the existing body of literature on 19th-century English medicine and society, principally works by social historians, economic historians, and sociologists. This well-documented bibliographic survey should be particularly useful to physicians and historians unfamiliar with the field.

The five essays that follow Woodward and Richards's long introduction explore such sociomedical topics, within 19th-century English history, as the development of the early birth control movement, physicians' views (principally, contemporary male stereotypes) of the nature of male and female sexuality, and a case study of the status and social role of medical men in Sheffield from 1790 to 1850. Ivan Waddington's concluding essay on the conflicts between general practitioners and consultants traces the changes that took place in the structure of the medical profession in the first part of the 19th century to the widening demand for medical care stemming from the growth of the middle class brought about by the Industrial Revolution.

Woodward and Richards's collection of essays, drawing upon wide-ranging, original source materials, should provide new insights for historians, sociologists, physicians, and devotees of the Victorian period.

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Behavioral Biology

Biological Determinants of Sexual Behaviour. J. B. HUTCHISON, Ed. Wiley-Interscience, New York, 1978. xviii, 822 pp., illus. $43.

Exposure to gonadal hormones has an organizational influence on the developing brain of an organism to direct its later responses to be congruent with its genetic sex. Similarly, a well-conceived book can help to set the direction of research as a field matures. This volume, in addition to performing the more usual function of reviewing the information available in the field, has the potential for performing such a function for the study of the mechanisms underlying sexual behavior.

The volume is divided into four sections: on developmental processes; on the integration of sexual behavior, with a focus on physiological mechanisms; on the patterning of sexual behavior; and on the biosocial factors influencing sexual behavior. The development of sexual behavior is described from a genetic perspective by T. E. McGill in a chapter containing many novel ideas not only for future research but for integrating available facts. This chapter is followed by several on the role of early experience in the development of sexual behavior, and the section concludes with chapters on the ways in which gonadal hormones act on the developing brain to guide neuroendocrine and behavioral responses in a feminine or masculine direction. Among the intriguing findings reviewed in this section is the finding that circulating testosterone can be metabolically altered, for example aromatized to an estrogen in the brain. It may be that the product of this reaction operates at the cellular level to orient specific neurons in a masculine direction. This idea, when taken in the context of the chapter by D. B. Kelley and D. W. Pfaff that opens the next section of the book, suggests that we can now add known metabolic events within the cell to the web of events connecting hormones with behavior. This web, and it is more of a web than a chain, includes not only changes in the level of circulating hormones but, as is pointed out by Kelley and Pfaff, modifications in specificity and affinity for hormones by target tissues. Two factors that modify what hormone or what quantity of a hormone a target cell may remove from the circulation are prior exposure to the hormone and, as discussed in a provocative chapter by Hutchison, environmental stimuli such as seasonal events or even prior experience. The demonstration that such events can modify hormonal responsiveness at the cellular level opens new avenues of inquiry into the mechanisms underlying behavioral expression. Although the recent discovery of sexually dimorphic structures in the brain and their possible dependence on the presence of gonadal hormones at critical times of early development has a great potential for influencing future research, this subject is given only brief attention in this volume. This is an unfortunate omission because it could have provided some anatomical underpinning to the biochemical events described.

The section on the integration of sexual behavior, consisting of 11 chapters, occupies almost half the volume. The most thorough and useful of the chapters in this section are those discussing the neural substrate for sexual behavior and the effects of hormones on its sensitivity. Two chapters deal with the neurotransmitters, especially the monoamines, that are known to be involved in sexual behavior. These chapters provide a very basic brief introduction to neuropharmacology that may be of considerable use to researchers oriented toward the behavioral and more traditional endocrinological aspects of sex. Here again, particularly in the chapter by B. J. Meyerson and C.-O. Malmnäs, some clear directions for future research are indicated. The authors point out that only 1 to 2 percent of the brain's neurons are known to contain aminergic transmitters and only about another 10 percent contain acetylcholine. This leaves neurotransmission in almost 90 percent of the brain's neurons unknown, although evidence is accumulating that amino acids such as glycine and gamma-aminobutyric acid (GABA) may perform part of this function. Strong suggestions that peptides such as luteinizing-hormone–releasing hormone (LRH) and derivatives of the adrenocorticotropic hormone (ACTH) may have direct effects on sexual behavior and memory processes support the notion that amino acids or peptides may play important roles as transmitters in the central nervous system.

In the brief section on the patterning of sexual behavior J. C. Fentress focuses on the short-term transitions in behavior and makes a strong plea for definition of behavioral units so that it will be clear whether an investigator is dealing with functional endpoints, movements and postures, or causal antecedents of behavior. Clarification of these issues is essential in a field that is clearly becoming more interdisciplinary.