BOOK REVIEWS

Empiricist Physician

Fundamenta Medicinæ. By Friedrich Hoffmann. Translated and introduced by Lester S. King. (History of Science Library: Primary Sources.) Pp. xxvi + 142. (Macdonald: London; Elsevier: New York, January 1971.) £3.

THE seventeenth century was fertile with new ideas in medicine and science. Long established Aristotelian doctrines began to crumble before the assault of Baconian empiricism and atomism modified by Descartes, Gassendi and Boyle: the emergence of the iatrochemical and iatromechanical "schools" of medicine completed the rout. It is tempting to classify seventeenth century physicians into various "schools" such as Galenist, iatrochemist or iatrophysicist, but these categories, favoured by latter-day interpreters, were not so clearly defined. In spite of the increased knowledge of scientific medicine, adherents of the chemical or mechanical schools did not really succeed in discarding Galenic remedies or dispensing with the basic tenets of humoral pathology. In this respect Friedrich Hoffmann (1660–1742) was typical of his times.

Born in Halle, Hoffmann studied medicine at Jena and Erfurt, qualifying in 1681. After visiting medical schools in France, Holland and England (where he met Boyle) he returned to practise in Minden and Halberstadt. In 1693 Frederick III invited him to become Professor of Medicine at Halle and, apart from a few years in Berlin as court physician, Hoffmann spent the rest of his life there as a university professor. His interest in medical education led him in 1695 to publish his *Fundamenta Medicinæ* as an introduction to systematic medicine.

Hoffmann's faith in scientific medicine is clear from his introduction. "Mechanics alone, wedded to anatomy and chemistry," he wrote, "has so far led natural and medical science from a low position to an exalted one." Although he was able to interpret physiological processes in mechanical terms (his theory of disease too is a mixture of humoral pathology and atomic theory). Hoffmann found it difficult to explain mental processes in similar terms. After removing the theological concept of "soul" beyond

the realm of his treatise, Hoffmann tried to reconcile the rational, volitional functions of the mind with the mechanical functions of the body. He postulated that sensory perception and muscular movement were due to the animal spirits controlled by the sensitive soul—a concept expounded by Willis in *De Anima Brutorum* (1672). His diagnostics, hygiene and therapeutics were concerned with the "art" of medicine and, like Sydenham, Hoffmann followed Hippocratic principles based on generalizations drawn from his own experience. He regarded body fluids as the site of disease and stressed the diagnostic importance of analysing blood, saliva, perspiration, lymph, urine and "spirits". An example of his diagnostic empiricism is the statement that "red urine without fever indicates scurvy". The maintenance of health he thought depended on the balanced interaction of the "six non-naturals—air, food and drink, sleep, useful activities and rest, evacuation and repletion and the emotions and passions". Hoffmann's therapeutics were based on his own experience of drug action within the theoretical framework of humoral pathology. He used Galenicals rather than chemical remedies, and although his theory of drug action was essentially mechanical, his actual prescribing was reassuringly empirical. Thus there was a conflict between the art of the physician using drugs based on past experience, and the scientific doctor anxious to propagate new discoveries in physics and chemistry.

This small volume precisely translated and usefully introduced by Dr Lester King is of general interest to the medical historian and essential reading for the seventeenth century specialist.

KENNETH DEWHURST

Small Mammals

Energy Flow Through Small Mammal Populations. Edited by K. Petrusewicz and L. Pyszkowski. (Proceedings of IBP Meeting on Secondary Productivity in Small Mammal Populations, held in Oxford, England, July 29th to August 2nd, 1968.) Pp. 298. (Polish Scientific: Warszawa, 1969/1970.)

THIS volume contains the proceedings of a meeting held under the auspices

of the International Biological Programme and yet, from the contents, one might get the impression that work on small mammals is non-existent in Africa, Asia, Australasia and South America. Of the fifty-six participants from fourteen countries, twenty-two came from central or eastern Europe five from North America and the remainder from western Europe. Twenty-two of the thirty-one contributions were written by ecologists from eastern Europe and surely this emphasizes the activity and leadership of these scientists within the context of IBP small mammal ecology.

The contents refer primarily to European work but this does not detract from their importance to small mammal ecology throughout the world. The contributions are grouped into four major sections: (1) standing crop evaluations and dynamics of numbers; (2) food resources and bioenergetic parameters; (3) reproduction and survival and (4) energy flow and productivity estimations. The eleven papers in the first section critically examine methods for estimating population density. It is clear that none of the currently used methods are entirely satisfactory for making absolute density estimates; however, both the mark-release-recapture and the standard minimum removal methods can, when combined with a knowledge of home range and residency, give rise to acceptable estimates. Ingenious methods involving the use of coloured baits and/or radioisotopes are suggested for the determination, among other things, of residency and home range.

The second section comprises nine papers and these, although dealing with the common theme of food resources and bioenergetic parameters, are a miscellaneous collection. In one instance the effect of small mammals on vegetation is considered, in others the effect of different food types on the animals is discussed. Yet other papers are methodological in nature, or deal with seasonal changes in the energy content or respiratory rate of single species.

Two of the papers in the third section tackle the difficult problems of estimating the number of young born into a population and the average