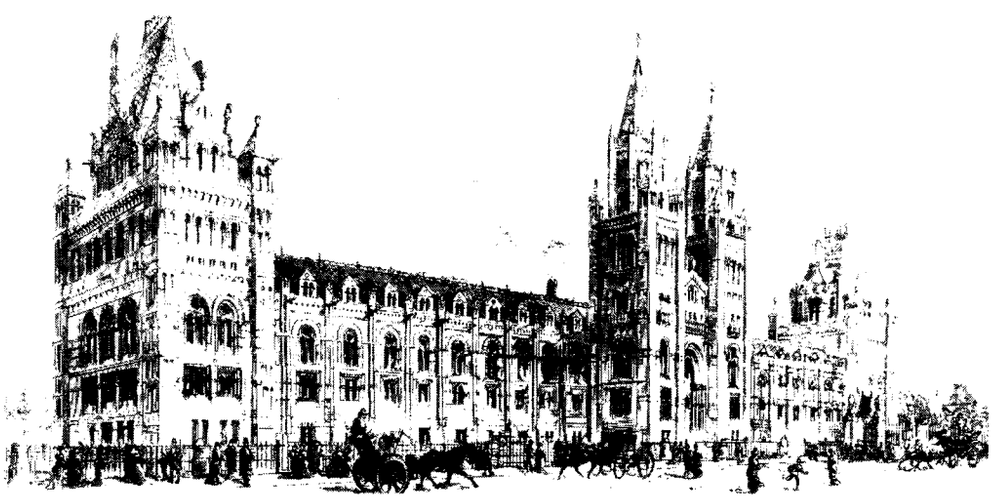
Book Reviews

An Enterprise in Science

The Founders of Science at the British Museum, 1753–1900. A. E. GUNTHER. Halesworth Press, Halesworth, Suffolk, England, 1980. x, 220 pp., illus. $20.

This unpretentious book casts much light on the way science developed in the 19th century by focusing on an institution and its gradual evolution. What we are given is a series of biographies of the officers in the natural history section of the British Musuem, down to its separation from the "arts" side of the collections in 1881, when it moved into a large new building in South Kensington. For the most part, those associated with the museum were not the great or revolutionary figures whose names are familiar to many people, like Darwin and Huxley. We are confronted with more normal and typical science, but this makes the story no less interesting.



The British Museum (Natural History). [From *The Graphic*, 27 March 1881]

The first point that emerges is the gradual increase in professionalism. J. G. Children was appointed keeper of zoology in 1821 not because he knew any zoology but because he knew Sir Humphry Davy. British society still worked by patronage, and Sedgwick, who taught Darwin geology, was in the same way made a professor at Cambridge because he was a sound man who would soon teach himself the subject; even in the United States, Silliman was appointed professor of chemistry at Yale on the same basis. Children's appointment caused an outcry, and generally thereafter competence in their field was expected of those appointed at the British Museum. Many were medical men, but the next keeper, J. E. Gray, was, like Davy and Darwin, a medical dropout. Children was unusual in that his social status made it easy for him to deal with the aristocratic trustees who governed the institution.

The next point is the growth of specialization. Sir Hans Sloane had collected everything, and his bequests formed the basis of the British Museum. The trustees became responsible for stuffed birds and dried insects, for works of art of different ages and countries, for ethnographical material brought back by Captain Cook, and for books and manuscripts. Moth and rust soon corrupted the natural history collections; but the principle was that all culture should be gathered under one roof, and the trustees were suspicious of the rival experts who looked after the various departments and competed for the scarce funds. By the early 19th century, the interests of the natural historians and of the fine arts and library departments were at odds—one can perhaps see here the beginnings of the two cultures to which C. P. Snow called attention in the 1950's.

By the middle of the century, natural history itself had split into parts, with botany, mineralogy, and zoology all competing for fossils; these various departments all had their staffs, and thus divisions between disciplines were displayed in infighting in the museum. There was an attempt to get the botanical collections to Kew; but the museum survived, and even flourished so that the collections increased rapidly in size and, as they were labeled and cataloged, in usefulness. The appointment of Richard Owen as superintendent in 1856 meant that natural history had a powerful advocate, who soon decided that a separate building must be provided for it. He successfully lobbied the trustees and the government and overcame the resistance of many men of science to the move; and by 1900 the Museum had become a center for both public education and specialized research.

The book is not always clear in its focus and has too many misprints, but it is a useful and suggestive contribution to the centenary year of the British Museum (Natural History).

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An 18th-Century Figure

Sir Joseph Banks. 18th Century Explorer, Botanist and Entrepreneur. CHARLES LYTE. David and Charles, North Pomfret, Vt., 1980. 248 pp., illus. $32.

Considering his commanding stature in late-18th-century British scientific circles and the wealth of materials he left behind, Joseph Banks has been poorly treated by biographers. A "Life and Letters" did not appear until nearly 100 years after his death. And when a real effort was finally made by H. C. Cameron to produce a scientific biography (1952) the tale was limited to 280 pages plus appendixes. Granting the difficulties of studying him owing to the unfortunate dispersal of his papers in the last century, the man who circumnavigated the world as "chief scientist" on Cook's first voyage, who directed Kew Gardens

for his friend George III, and who presided over the Royal Society for 42 years surely deserves more press.

The latest attempt, by Charles Lyte, a British journalist, is a visually gorgeous production, sporting two dozen top-quality photographs (eight in color). Its frequent, well-chosen quotations from Banks's letters and journals make it a delight to read as well, notwithstanding the author's propensity for short, one-sentence (newspaperlike?) paragraphs. Over a third of the book is devoted to the career-making *Endeavour* voyage with Cook, particular emphasis being given to Banks's ethnographic interests and talents for dealing with Pacific Islanders. Lyte also provides previously scarce details of Banks's private life and his adventures with the opposite sex.

Indeed, this is a social, not scientific, biography. Precious little is said of the results of all Banks's "botanizing." If we admit that he was more an entrepreneur of science than a scientist, then we ought to expect more than a mere two chapters (totaling 30 pages) on his superintendence of Kew and the Royal Society. Lyte does stress Banks's generosity in subsidizing younger scientists, but he does not refer even once to the most famous of his assistants, Robert Brown. Other prominent scientific personalities who had Banks associations, such as the Forsters of Cook's second voyage, are also missing. The author seems eager to display his protagonist as more the enlightened member of 18th-century England's aristocracy than the leader of her scientific community (an assessment of Banks perhaps generally extant since the professionalization and mathematization of British science in the 19th century). A clearly articulated argument to this effect (or its reverse) would have given additional direction to the narrative.

Historians are likely to be disappointed by the absence of citations for the multitudinous quotations used, the minimal (half-page) bibliography, and the incomplete index, largely of names. A map of the track of the *Endeavour* would also have aided the reader materially. In short, for a chatty, splendidly illustrated introduction to Banks the man, Lyte's book is fine. For an analysis of Banks the pivotal promoter of Georgian science, we must return to Cameron's earlier study or wait until the materials are assembled for the definitive biography.

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Neuroendocrinology

Peptides. Integrators of Cell and Tissue Function. Papers from a symposium, Woods Hole, Mass., Sept. 1979. FLOYD E. BLOOM, Ed. Raven, New York, 1980. xiv, 258 pp., illus. $23. Society of General Physiologists Series.

In organizing a symposium for the Society of General Physiologists on the general topic of peptides, Floyd Bloom wanted to "avoid generating yet another meeting on the same topical molecules with the same group of speakers." This volume is a series of essays written by the people who participated in Bloom's symposium. Their contributions reflect the diverse regulatory roles played by biologically active peptides, and to the extent that Bloom successfully met his goal this is a unique and interesting book. Among the papers that it contains, a few should be singled out for special mention.

Gospodarowicz and his colleagues present their work on fibroblast growth factor. They describe its two most prominent actions on vascular endothelial cells: its mitogenic effect and its effect on the phenotypic expression of cells once they grow to confluence. In a subsequent essay Scher and his co-workers talk about the mechanism of action of fibroblast growth factor and platelet-derived growth factor in initiating cell replication. The two papers complement one another nicely and provide an excellent introduction to studies of cationic polypeptide growth factors.

Truman and Schwartz outline their investigations of eclosion hormone, a peptide hormone secreted by brain neurosecretory cells just prior to the time when the adult insect emerges from the pupal cuticle. In addition to altering the insect's behavior and the composition of its epidermis, the hormone initiates degeneration of a specific set of muscles and their associated neurons, and it is the latter action that is the focus of the review. The story that has evolved from this work is fascinating and well worth reading.

Greenberg and Price have for some years been interested in substances (including peptides) that regulate cardiac function in mollusks. A total of six cardioactive neuropeptides have been found in mollusks to date. Only one of these has been identified: phenylalanyl-methionyl-arginyl-phenylalanine amide. The actions of this peptide are discussed lucidly and in detail, and the information that is available on the other cardioregulatory neurohormones is summarized.

Finally, Strumwasser and his colleagues describe their elegant studies of reproductive behavior in the mollusk *Aplysia*. They have isolated an egg-laying hormone from neuroendocrine cells in the animal's nervous system and two other peptide hormones secreted by cells of the animal's reproductive tract. They consider the role of these peptides in depth in their well-written paper.

Several of the other reviews in the book are quite good, but they are more general, devoted to "the same topical molecules" that have already received so much attention, and written by authors whose work and ideas have been in the limelight. Despite this criticism, I enjoyed reading the entire volume and recommend it to graduate students and workers in the field.

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Population Genetics

The Mathematical Theory of Quantitative Genetics. M. G. BULMER. Clarendon (Oxford University Press), New York, 1980. x, 256 pp. $74.

Population genetics theory has, almost since its origin, been beset by a schism between those concerned with quantitative or continuously variable characters and those concerned with Mendelian characters. The two ways of modeling the inheritance of phenotypic characters were reconciled by Wright and Fisher, but there is still too little contact among the two parts of what should be a single subject. Quantitative geneticists have been concerned largely with the statistical description of populations and the prediction of short-term changes. Population geneticists modeling Mendelian characters have concentrated on characters controlled by one or only a few genetic loci and have been concerned with the evolutionary implications of their models on long time scales. These models, the use of which was characterized as "beanbag" genetics by Ernst Mayr, formed part of the basis for the neo-Darwinian synthesis that was developed in the 1930's and 1940's. Quantitative genetics, by contrast, has had so little effect on evolutionary theory that some evolutionary biologists have seemed unaware of its relevance. For example, S. Løvtrup has written, "The first postulate [of neo-Darwinism] asserts that in an organism all relevant