Book Reviews

Asa Gray. A. Hunter Dupree. Belknap Press of Harvard University Press, Cambridge, Mass., 1959. 506 pp. Illus. $7.50.

Almost every botanist in the United States has, as a student, used Asa Gray's *Manual of Botany,* which is still one of the more useful aids for studying the flora of our northeastern states, and still a very useful tool for teaching students how to identify plants. To beginning botanists, "Gray" is practically synonymous with *Manual of Botany*. Biologists who are interested in evolution (and in 1959, the 100th anniversary of the publication of Darwin's *Origin of Species*, nearly all biologists are) know that when Darwin and Wallace presented their famous papers to the Linnaean Society of London, Darwin included in his, as evidence for his priority in describing natural selection, a letter he had written to Asa Gray. Today, we remember Gray both as a leading systematic botanist of the 19th century and as a personal friend of Charles Darwin —a friend who aided Darwin in establishing and spreading the theory of evolution. How much more there was to Asa Gray, what kind of a man he really was, and what he accomplished as a scientist is told in this remarkably well-written biography by Hunter Dupree.

Now the life of a respectable 19th-century botanist, who labored over his *desiccata* ("baled hay" to irreverent scoffers), who collected specimens over a wide territory, who assembled a herbarium, and who named new genera and species, may be deadly dull even though the subject of the biography may have engaged in the no-holds-barred and no-quarter-given fights over nomenclature. To both students and teachers, reading the biographies of such worthy men may be an unpleasant but necessary chore. But reading this life of Asa Gray is no chore at all. It is a pleasure; in fact, the author has made his book so interesting that most readers will resent, rather than welcome, any little incident that interrupts them. *Asa Gray* is an excellent example of the kind of writing that has recently made biographies so popular.

This is not intended to imply that Dupree has fictionalized his subject. On the contrary, he has documented it thoroughly by citing over 800 references to primary sources, and if he peers into the subject's mind at times and tells us exactly what Gray's thoughts were, he is always able to cite Gray himself as the authority. In this biography Gray definitely comes alive. But, perhaps, despite his narrative skill and mastery of his subject we need not give the author all of the credit for the interest that this book arouses, for Asa Gray cooperated with his biographer by leading a very interesting life.

Gray was born in 1810 in Sauquoit, New York, and grew up in the central valley, at just the time that the first educational institutions of the region were being established. He became a doctor of medicine in 1831, but practiced only a little more than a year. His primary interests were always those of a naturalist, and he spent all the time that he could spare in gathering botanical, zoological, and mineral specimens. He had the good luck to meet and fall under the influence of John Torrey and, in working with Torrey, he became an expert taxonomist. After some years of odd jobs and financial insecurity, but years of productive scientific labors, he established an outstanding reputation as a botanist, and in 1842 was offered an endowed chair at Harvard University, where his salary of $1000 a year relieved his financial insecurity. But, to earn his stipend, he had to become a one-man department of botany. He taught botany, established what later became the Gray Herbarium, and supervised the Harvard Botanic Garden. But over and beyond these routine occupations, he indulged his wider interests and spent as much time as he could in identifying and classifying the western plants sent him by various governmental exploring parties.

As Gray's knowledge of the American flora increased, he discovered regularities in the distribution of certain genera and species, and his interest in plant distribution grew. In fact, he was one of the founders of plant geography, and it was in this field that his very original work came to the attention of Charles Darwin. It was here that, without knowing it, he made an important contribution to the theory of evolution. Gray and Darwin exchanged letters and became close, personal friends, and when Darwin published *The Origin of Species*, Gray reviewed it and saw to it that Darwin got a fair hearing in the United States. Gray was Darwin's first American sponsor.

From a personal standpoint, Gray's long and sometimes bitter contest with his Harvard colleague, Louis Agassiz (who did *not* accept Darwinian evolution) furnishes the material for perhaps the most interesting portion of the book. Here, we get a glimpse of academic politics, of the growth of science in the first American university, and of the establishment of the National Academy of Sciences. We also get a view of contemporary scientific standards.

Attention should be called to two aspects of this biography that are not adequately expressed in its brief title, *Asa Gray*. First, Dupree's treatment transcends Gray as an individual and depicts, in fascinating detail, the alarms and excursions of 19th-century biology. Dupree makes the science of the time very real, and the actors—the scientists —very human. Finally, he gives us a great many important facts about the group of men who worked with and around Charles Darwin—Sir Charles Lyell, Thomas Henry Huxley, Joseph Hooker, Alfred Russell Wallace and others—the group that introduced evolution to the world. Gray was a very important member of this group.

This biography of Asa Gray is definitive.

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Law and Administration. vols. 1 and 2. Herbert S. Marks, Ed. Pergamon Press, New York, 1959. xiii + 994 pp. $26.50.

This work is an authoritative and comprehensive source of background information in the field of atomic energy. The tenth of 12 subject categories in the ambitious series "Progress in Nuclear Energy," the work is in two

volumes. Volume 1 presents authoritative articles on specific aspects of law and administration relating to the nuclear-energy programs of the United States, the United Kingdom, Euratom, the International Atomic Energy Agency, and Israel. Volume 2 presents the texts of nuclear-energy legislation and regulations in effect in 25 countries, together with succinct commentaries on the history and status of atomic-energy control in each country.

Each chapter in volume 1 is written by a recognized authority. These chapters present a distillation of the history, conflicts, compromises, and status of the new legal and administrative arrangements that have evolved, primarily in the United States and Britain, as governments respond to the new nuclear technology. John Palfrey's opening chapter is an excellent "legal chronicle" of the United States federal statute, while William Krebs' chapter on state activities and Casper Ooms' chapter on patents are clearly indicative of the authors' deep understanding of the subject matter. I wish that chapters had been included on the new administrative arrangements evolving out of AEC-contractor relationships, or that there had been more specific material concerning the growing federal-state-local problem of licensing and control of private atomic-energy facilities. These are minor criticisms, however, of a noteworthy treatise.

Volume 2, except for the commentaries, is a reference source on foreign legislation and procedures—clearly of limited interest to all but the specialist. The commentaries are useful summaries.

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The Emergence of the German Dye Industry. John Joseph Beer. University of Illinois Press, Urbana, 1959. vii + 168 pp. Cloth, $4.50; paper, $3.50.

This detailed account of the German dye industry begins with Perkin's discovery of mauve dye (analine purple) and terminates with the formation of the I. G. Farbenindustrie. It is less a history of the scientific and technical development of the industry than an analysis of the social, economic, and scientific factors which brought about that most spectacular chapter in the extraordinary history of the chemical industry in the 19th century.

It is surprising that this story has not previously been recounted in English, especially since the German dye industry has been celebrated in the United States as an example of commercial and scientific iniquity. It is the more surprising inasmuch as a considerable number of general histories, company histories, and personal memoirs on the subject in German have long existed.

From this account, the *bête noire* appears to be little worse or better than the rest of us. In fact, while the influence of the chemical industry on German technical education and the patent system was instrumental in securing the initial advantage Germany enjoyed in World War I, Beer concludes that the failure of the German chemical industry consciously to prepare for war in 1914 constituted a limitation on that initial advantage. His conclusions are drawn from published data, plus a few unpublished German sources.

The extent to which Beer brings the German dye industry into the realm of the familiar is illustrated by his remark that "the only reason all the dye companies continued to spend heavily on dye research was for prestige reasons very similar to those which impel the American auto industry to change models every year" (page 123). He emphasizes the role of capitalistic enterprise as a factor in the spectacular growth of the dye companies and notes that Carl Duisberg (later board chairman of I. G. Farbenindustrie) credits to his observations of the American trusts in 1903 some of the ideas which led to the formation of the German combine. The detailed history of the I. G. Farbenindustrie is not a part of this book, however.

Having reduced the story of the German dye industry from the mysterious to the familiar, Beer points out that the factors cited point to the inevitable emergence of the institutional research activities represented by that industry. But he also points out that the coincidences of time and circumstance revealed by an analysis of a specific example such as this are often of the greatest importance in the world as it is. The truth of this is quite evident in the fascinating case history that he has written.

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Family Planning, Sterility, and Population Growth. Ronald Freedman, Pascal K. Whelpton, and Arthur A. Campbell. McGraw-Hill, New York, 1959. xi + 515 pp. Illus. $9.50.

A quarter of a century ago, voluntary parenthood seemed inconsistent with population maintenance. Demographers forecast declining populations with reasonable surety, for birth rates had been moving downward for more than a century. Then birth rates increased in practically all social and economic groups except the lowest, where the decline continued. Moreover, the increases were generally greatest in the groups where the birth rates had been lowest. Voluntary parenthood was consistent not only with childlessness and disappearance of ethnic differences but with a familistic orientation of life that would sustain continuing increase of the population. The assessment of the future population of the nation became a topic of wide conjecture.

The studies made by P. K. Whelpton of the Scripps Foundation for Research in Population Problems had shown that the measurement of trends in fertility should be based on the life-time performance of cohorts of women rather than on the levels of general or age-specific birth rates in specific time periods. However, the past childbearing record of cohorts of women did not provide an empirical basis for estimating future childbearing. These future estimates required knowledge of the wishes and anticipations of families, and of the probable relationship between the numbers of children that were expected and the numbers that would be born. It is these new dimensions of population research that were the goals of the study reported in *Family Planning, Sterility, and Population Growth.*

The Survey Research Center of the University of Michigan and the Scripps Foundation for Research in Population Problems cooperated in this study of family planning and fertility. The 2713 white, married women who were interviewed represented a probability sample of the national population of some 17 million white wives aged 18 to 39 in 1955. The trained interviewers of the Survey Research Center met with unexpected frankness and cooperation in the responses to queries concerning attitudes toward, and practices of, family limitation. Interviews were secured