security. Growing suspicion of danger in almost any type of federal assistance seems to have inhibited the experimental attitude that one would expect in a scientific organization. No one wishes to be controlled by a bureaucracy, but there were many instances where vigilant acceptance would have been better than total rejection. It is interesting to note that in recent years, the budgets of medical schools have been sustained to a very large degree by federal grants but that there has been no appreciable interference with educational policy or research programs.

Burrow gives relatively large space to the struggle against compulsory health insurance. He reveals the struggle within the Association and gives examples of the bitter distortions that damaged the image of the AMA with both the medical profession and the public. The author speaks of "the association's somewhat exaggerated suspicion of innovations" and quotes the early warning of the Council on Health and Public Instruction (of the AMA): "Blind opposition, indignant repudiation and bitter denunciation is worse than useless; it leads nowhere and it leaves the profession in a position of helplessness if the rising tide of social development sweeps over them."

The author closes his discussion of this complicated problem astutely and tolerantly: "While the Association had strengthened the democratic process by retarding the nation's drift toward a comprehensive program of medical care that had no convincing popular mandate, it had failed to provide the electorate with adequate information so essential to the formulation of national policy. By publishing distorted accounts of deficiencies in the operation of compulsory systems abroad, it stood in danger of ultimately damaging its own cause: in finding behind much of the legislation it opposed the spectre of 'socialized medicine', it resorted to a use of loose terminology that stood in sharp contrast to its insistence on clarity of language in the drafting of federal legislation."

This unemotional appraisal is quite different from Morris Fishbein's bitter charge (in 1936) that opposition lay "among the 10 percent of our people who, because of ignorance, stupidity or prejudice, prefer the byways of charlatanism and faith healing."

The AMA has been a strong and effective force for good; it deserves so much credit for highminded leadership that many of its members and its friends are saddened when it uses some of the worst methods of politics as its responsibilities require it to enter the political arena.

DANA W. ATCHLEY
Englewood, New Jersey

National Conservation Policy

Federal Conservation Policy, 1921–1933. Donald C. Swain. University of California Press, Berkeley, 1963. 221 pp. Illus. Paper, $4.

It is generally believed that federal interest in the conservation of natural resources sank out of sight in the interval between Roosevelts I and II. But I recall that, during an otherwise not especially edifying talk with the then Secretary of the Interior Harold Ickes, he told me that he had gone over the documents of the Pinchot-Ballinger controversy and that, to his surprise, he had found Ballinger was in the right. To what extent the Terrible-Tempered Mr. Bang was swayed by the historic conflict between Agriculture and Interior, I cannot say.

Be that as it may, Donald C. Swain has justified, in a workmanlike manner, his final sentences: "Contrary to widely held opinion, the national conservation program did not deteriorate in the 1920's. It expanded and matured." His bibliography and acknowledgments give impressive support to the analysis in the text of his nine chapters. Seven of these chapters deal with the commonly recognized types of natural resource. Bracketing these seven are the first, a brief but useful survey of the conservation movement, and the last, "Prelude to the New Deal," which gives tardy and deserved credit to Herbert Hoover.

The gist of Swain's argument, and of his evidence, is that the several official resource agencies, whether inaugurated or encouraged during the administration of Theodore Roosevelt, carried on effectively during the following two decades. Although not all were equally aggressive, the net effect was one of substantial accomplishment.

What might be described as background music, or, to use the current fashion, "noise," were important differences in political and social philosophy. One of these involved federal versus state control, the latter at times shading off into reliance upon the entrepreneur. The other, especially dramatized in the conflict between Gifford Pinchot and Steven Mather, was the issue of the utilitarian versus the esthetic view of land use and management. Curious as it may seem, there is more than a hint that, as a matter of long-range economics, the esthetic view is the sounder guide. But if one reflects on the fact that the patterns of resource use are essentially problems in design, to be guided by scientific knowledge as well as taste, rather than by immediate self-interest, the paradox withers.

One of the conventions of the business requires a reviewer to establish his good faith by noting a few flaws in any book that he admires. The author might have shown the connection between overprotection of the Kaibab deer herd and his discussion of predator control. He might also have noted instances of overpromotion in the field of irrigation. And it would have been helpful to point out that problems have arisen because, in civil matters, the Corps of Engineers is more directly responsible to the legislature than to its commander-in-chief.

But these are minor items. I for one am extremely grateful to Donald Swain for his labor. There is, by the way, a good index.

PAUL B. SEARS
Yale University,
New Haven, Connecticut

Behavioral Science

The Behaviour of Domestic Animals. E. S. E. Hafez, Ed. Williams and Wilkins, Baltimore, Md., 1962. xiv + 619 pp. Illus. $14.50.

This book consists of 19 chapters, organized into four parts, and an epilogue. Part 1, Behaviour and Domestication, consists of two chapters: "Introduction to animal behaviour," by J. P. Scott, and "Domestication and the evolution of behaviour," by E. B. Hale. Part 2, Fundamentals of Behaviour, consists of seven chapters: "The genetics of behaviour," by J. L. Fuller; "The physical environment and behaviour," by M. W. Schein; "The social environment and behaviour," by A. M. Guhl; "The effects of early experience," by V. H. Denenberg; "Physiological mechanisms and behaviour patterns," by J. I.

Johnson, Jr., R. W. Goy, and K. M. Michels; "Behavioural pharmacology," by S. Ross and C. J. Carr; and "Techniques of measurement and evaluation," by V. H. Denenberg and E. M. Banks. Part 3 consists of seven chapters: "The behaviour of cattle," by E. S. E. Hafez and M. W. Schein; "The behaviour of sheep and goats," by E. S. E. Hafez and J. P. Scott; "The behaviour of swine," by E. S. E. Hafez, L. J. Sumption, and J. S. Jakway; "The behaviour of horses," by E. S. E. Hafez, M. Williams, and S. Wierzbowski; "The behaviour of rabbits," by A. N. Worden and J. S. Leahy; "The behaviour of dogs," by J. L. Fuller and E. M. DuBuis; and "The behaviour of cats," by J. S. Rosenblatt and T. C. Schneirla. Part 4, Behaviour of Birds, consists of three chapters: "The behaviour of chickens," by A. M. Guhl; "The behaviour of turkeys," by E. B. Hale and M. W. Schein; and "The behaviour of ducks," by E. N. Collias. The epilogue, Comparative Behaviour, was written by E. B. Hale.

In the foreword W. C. Young appropriately states that this book is timely because many research workers in many disciplines, notably psychologists, physiologists, ethologists, and ecologists, are probing into the physiology, structure, and behavior of man and other animals. The domestic birds and mammals—carnivorous, herbivorous, and omnivorous—present a much wider range of experimental materials than the usual laboratory animals. There is a great deal of information gained from observation and experience and a rapidly increasing mass of material from experiments on the domestic animals. This book presents both.

Hale, in the epilogue, defines two constellations of behavior pattern in mammals. One pattern includes polytocous reproduction, altricial development, sexual monomorphism, nocturnal habits, and extensive play. (The rabbit is exceptional since it belongs in this group but is an herbivore.) At the other extreme is found herbivorous diet, monotocous reproduction, precocial development, sexual dimorphism, promiscuous sexual behavior, diurnal habits, and limited play.

Birds have similar convergent trends in behavior. Herbivorous diet, precocial development, sexual dimorphism, promiscuous sexual behavior, and diurnal habits tend to be associated. Among both birds and mammals with this array of traits, "peck-right" dominance tends to be established, while altricial birds and mammals tend to be territorial.

In general, domestic species provide excellent material for quantitative studies of behavior, but standardized conditions necessary for cross-species comparisons have not been established.

Ancient lore substantiated and quantified through recent experiment is illustrated by the mother-young relationship. Shepherds have known for centuries that a lamb separated from its mother at birth may not be accepted by her when it is returned after a few hours. Nor will ewes readily accept foster young. Hafez and Scott (chapter 11, p. 320) discuss the relevant research in which Collias demonstrated that following a separation which lasted for an hour after birth lambs would be accepted but that some were rejected following a two-hour separation. Collias also found that he could exchange new borns from different mothers but that this could be done only immediately after birth. Goats are a bit less attached to one another and to the flock. Hafez and Scott note that in a mixed flock the goats are likely to move sooner than the sheep in responding to a disturbance and that the sheep follow the goats. They note that the old practice of using a "Judas Goat" to lead lambs to slaughter in stockyards is in keeping with this behavior.

Behavioral science is in the adolescent phase. Adolescent science, like adolescent children, is exciting in its promise, disturbing in its implication, and occasionally awkward and fumbling. This book contains material that provides a still half-spun web connecting the ancient art of animal husbandry with the emerging behavioral sciences. It provides an insecure link between genetics and behavior. It carries implications for human behavior which are based on demonstrated effects of imprinting of neonatal animals on their subsequent behavior and on demonstrated genetic and physiological bases for social dominance in animal communities.

The book contains some thought-provoking statements—for example, in chapter 3 (by Fuller), "The genetics of behaviour": on page 67, "It is probable that dominance in genetically heterogeneous populations is in part determined by heredity"; but, on page 68, "Perhaps we can fairly state that there is, as yet, no good evidence in animals for a general factor of intelligence which operates in all learning situations."

The contributors to this volume are and may continue to be significant contributors to behavioral science. Behavioral research with domestic animals is important in its potential to contribute new knowledge of general significance. It is especially important to the better understanding of these animals and of their roles in work and in the production of meat, milk, eggs, wool, and other essential animal products, including the companionship they provide as pets.

T. C. BYERLY
Cooperative State Experiment Station Service, U.S. Department of Agriculture

Note

Historical Chronology

William D. Stahlman and Owen Gingerich have served all who are interested in precise historical chronology by compiling and publishing these fine longitudinal tables for the sun and the planets—**Solar and Planetary Longitudes: For Years −2500 to +2000, by 10-Day Intervals** (University of Wisconsin Press, Madison, 1963. 596 pp. Paper, $10).

The tables cover the Julian calendar from the years −2500 to +1700 and the Gregorian calendar for the period from +1582 to +2000. Scholars who are anxious to establish the date of an event by referring to planetary positions that may be contained in a historical document must, as Stahlman remarked in his lucid introductory statement, "use the existing astronomical tables essentially in reverse in such a manner as to find an historically plausible date on which the planets were in fact in the given positions." This is usually a complicated task that is beyond the purpose of the chronological problem itself, though necessary to its proper solution, and often it is beyond the capacities of those interested in determining a particular date. The present tables avoid this complexity and add another analytical weapon to the armory of historical scholarship. It is a measure of the nature of learning in our time that production of the table was made possible through the work of a historian, an astronomer, and the IBM-7090 computer at the Smithsonian Astrophysical Observatory.

HARRY WOOLF
Department of History, Johns Hopkins University