Stress Physiology of Man and Other Mammals

Introduction to Environmental Physiology. Environmental Extremes and Mammalian Survival. G. EDGAR FOLK, JR. Lea and Febiger, Philadelphia, 1966. 308 pp., illus. $12.

One can assure the primary audience to which Folk has addressed this book —graduate students, and environmental physiologists in general—that it is a volume worth more than its price. Some details aside, the author has succeeded in quickly encompassing the modern environmental physiology of man and other mammals, and has done it well, in a profusely illustrated work of a moderate size.

Stress physiology is emphasized. The two major stressor land environments, symbolized on the cover of the book by tundra and desert, are not equally treated. The author is clearly more at home in cold climates than in hot, and one of the book's greatest values results from Folk's large personal experience with men and animals in cold, harsh environments.

This is a creative synthetic work, albeit at an elementary level, and in many ways it fills a gap. It begins with a mammal-oriented discussion of the acclimation-acclimatization terminological problem, out of which comes refreshing emphasis of the distinction between physiological adjustment and genetic adaptation. Even with Folk's lengthy and much appreciated treatment of the problem we undoubtedly still have a long wait ahead before the final demise of the use of the unfortunately misleading combination "physiological adaptation" for physiological adjustment.

A review chapter on biological rhythms is followed by the major coverage of stress physiology, most of which is deliberately rather extensive than intensive in treatment. Thus it is not intended to satisfy advanced students interested in relevant mechanisms, which are as diverse as those pertaining to energy exchange and evolution. Greater emphasis on statistical analysis of both environment and rate function would have been welcome. It is not clear why scientific names have been removed from the text and replaced, sometimes with obvious difficulty, by vernaculars of vague description (for example, "a rat-sized rodent related to guinea pigs").

Throughout the book the author leaves little room for doubt that he is a physiologist first and an environmentalist and evolutionist second. Thus he is to be highly commended for his very considerable effort in providing the student of functional environmental biology with a diversified and useful book that provides wide coverage for the harsh effective environments on earth, environments that have molded some of the most interesting mammalian evolutionary adaptations and concomitant mechanisms for physiological adjustment.

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What To Do with What We Know

Knowledge and Power. Essays on Science and Government. SANFORD A. LAKOFF, Ed. Free Press, New York, 1966. 512 pp. $9.95.

It is only a slight exaggeration to say that since Albert Einstein wrote his famous letter to President Roosevelt, American scientists have been trying to unlock the secrets of the universe with the keys to the federal treasury. This is, no doubt, as it should be, since one of a developed nation's most precious assets economically and politically is its capacity to produce technological innovations. These in turn depend upon its capacity to produce and assimilate fundamental knowledge. And so an understanding of the linkages between persons specializing in the exercise of power and those specializing in the production of knowledge is crucial to an understanding of any modern society.

It is by no means clear to me what these linkages are or ought to be; but this collection of essays by diverse people gives a good bit of raw material from which answers applicable to the contemporary United States could be constructed. Its 15 chapters are perhaps not quite 50 percent more useful for these purposes than the 10 essays in Gilpin and Wright's very similar *Scientists and National Policy-Making*, published three years ago (Columbia University Press). But the overlap between the books has to do with shared subject matter; no essay appears in both collections.

Judging from the Lakoff volume, the most striking characteristic of present-day relations between science and government is that they are highly institutionalized. I infer this from the amount of space devoted to the description of governmental institutions in being, emergent, or proposed. Separate chapters by Enid Curtis Bok Schoettle, Roger A. Kvam, Carl William Fischer, and Eileen Galloway chronicle the establishment of NASA, the operations of Comsat, the President's Science Advisory Committee, and three proposals to institutionalize scientific advice to Congress. They all seem to me to be quite competent, clear, and useful narrative accounts.

Two essays pose somewhat more sharply within the context of specific cases a problem that scientists will recognize as especially important—namely, the extent to which scientific findings can be employed in the making of national policy. The two cases have to do with the feasibility of a nuclear test ban (described by Cecil Uyehara) and the relationship between smoking and health (by Stanley Joel Reiser). In the first case, scientists found themselves making judgments that mixed scientific findings with political evaluations. In the second, politicians found themselves unable to interpret scientific advice. These cases demonstrate that the line that runs from scientific evidence to scientific conclusions and from these conclusions to judgments of national policy does not always run straight.

This is not exactly news. It occurs to me that had editor Lakoff been somewhat more intrusive in shaping his material, or more explicit in expressing criteria for his selections, he might have included some remarks that grapple directly with the problem of finding rational decision rules under conditions of scientific ignorance—such as Warner Schilling has discussed in his "Scientists, foreign policy, and politics" (in the Gilpin and Wright volume).

A third cluster of essays addresses the problem of finding appropriate criteria for determining the level and distribution—among projects, disciplines, and institutions—of national resources for the support of science. Most of the essays falling under this rubric—by Alan Waterman, Alvin M. Weinberg, Harvey Brooks, and Philip Abelson—are uplifting rather than penetrating. But in fairness to the authors it should be said that many of these essays were originally written for ceremonial occasions.

Plainly, there is much food for thought in this volume. It did not seem