Book Reviews

Science and the White House

Presidential Politics and Science Policy. JAMES EVERETT KATZ. Praeger, New York, 1978. xxii, 294 pp. $22.95. Praeger Special Studies.

The sociology of science has in recent years displayed great vigor in the analysis of the internal structure of science into "invisible colleges," communication patterns among scientists, sociological processes in scientific discovery, norms of scientific behavior, and the reward system of science. Relatively little attention has been given, however, to the effect of the federal government on the internal functioning of science, even though the dominant portion of research support has long come from this source. Nor have sociologists given much attention to the organization and functioning of the federal government as science policy is formulated and implemented. Katz, in *Presidential Politics and Science Policy*, has addressed this last problem by providing us with a political sociology of science policy. His book is noteworthy in its attempt to redress an imbalance within sociological studies of science, and it is to be hoped that other sociologists see fit to pursue some of the problems Katz identifies and treats.

Katz's book is notable for two other reasons. First, it is the only book-length treatment of presidential involvement in U.S. science policy that covers the full sweep of events from the end of World War II to the present. Second, it attempts to "test" two hypotheses about the modern presidency as observable in the domain of science policy, namely, a pluralistic conception of presidential power as opposed to a "power-presidency" conception (à la C. Wright Mills).

The historical portion of the book devotes two chapters to the presidential organization for science, one to the role of the Bureau of the Budget/Office of Management and Budget (BOB/OMB) in national science policy, one each to presidents Eisenhower through Nixon, and one to Ford and Carter. Though the organization is somewhat awkward and the presentation of material rather choppy at times, we are presented with a view that encompasses more than just the presidential apparatus for science policy. On the other hand, the historical account has some serious weaknesses. The science policy role of the National Security Council, for example, in interaction with the Office of Science and Technology, the President's Science Advisory Committee, the BOB/OMB, and the various organizations and advisory bodies within the Department of Defense is never adequately developed. This is unfortunate, since the National Security Council has always been a major (often *the* major) presidential staff agency in foreign and defense policy and a prominent "user" of scientific and technological analyses. In the treatment of the Eisenhower atoms-for-peace initiative (which is discussed under the subheading "Technology Policy: Civilian Technology"), to take another example, the bureaucratic and congressional processes behind the initiative are discussed but the discussion of policy substance and its evolution is simply inadequate. Indeed, this instance illustrates a propensity revealed throughout the book; Katz often does not push behind the available secondary literature for his empirical data. Sometimes the history comes out wrong in irritating ways. The work of the Wooldridge (misspelled Woolidge) Committee, which reviewed the National Institutes of Health in 1964 and reported in 1965, is discussed prior to consideration of the hearings by the Fountain Committee of the House of Representatives in 1962 and 1963, and without any indication that the genesis of the former was a response to the latter. One could perhaps be more charitable if the historical material did not loom so large in the overall effort. In short, Katz has written a useful primer on presidential involvement in science policy for students coming to the subject for the first time, but a book that will be of limited use to knowledgeable persons.

The central purpose of the book, however, is not history but interpretation. Katz's purpose is to examine whether the presidential relationship to science and technology policy is better understood in terms of the "power presidency" or of the "persuasive presidency." In the former conception, a "political directorate," with the president and his advisers at the center, constitutes a power elite with the capacity to prevail in policy formation conflicts. The power of the presidency arises from the limitations of the Congress, the ineffectiveness of political parties, the impotence of popular will, and the limits of the bureaucracy. The "persuasive presidency," a contrasting pluralistic interpretation, is construed as limited by the significant role of the Congress, the importance of political parties, the effective check on presidential action of the popular will, and the residual power of the bureaucracy. The conclusion is that "the president and his officers are able to exert a powerful and sustained influence over science policy and technology programming" and that "presidential power in all its manifestations constitutes the prime instrument of national science and technology policy," with the consequence being that "the power-presidency theory accounts for national science policy more successfully than pluralistic theory."

There are serious problems, however, with the basic argument. First, no criteria are developed for "testing" the relative explanatory power of the two theories and no careful method is used to weigh the evidence. Second, the numerous small difficulties with the historical data limit their persuasiveness in supporting the power theory. Third, the importance of political parties in the pluralistic theory is overstressed and the importance of multiple power centers that challenge presidential power is underemphasized. Fourth, it is a basic fact that national security policy and the controllable portion of the federal budget, in which most of the basic allocation choices in science and technology policy are embedded, are, for constitutional, historical, and structural reasons, subject to a high degree of presidential discretion. This fact is not adequately recognized. Finally, the data in support of the power-presidency theory can be easily turned to support a pluralistic view, with the result of the argument being a standoff at best.

Within the past year, the nation has witnessed a protracted conflict between the President and the Congress on national energy policy, with numerous producer and consumer interests being among the political positions represented. Energy policy has to be regarded as the central science policy issue of our times. But the near-paralysis evidenced by the prolonged debate does little to support a power-presidency view of the world.

Katz has written a book that will have a utility to many because of its historical sweep of a complex subject. But it is a

book whose promise is not fully realized. It is to be hoped that the genuine need to which he has addressed himself will lead to further research that goes beyond the limitations of this treatment.

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Historical Oceanography

Oceanic Micropalaeontology. A. T. S. RAMSAY, Ed. In two volumes. Academic Press, New York, 1977. Vol. 1, xii pp. + pp. 1–808, illus. + index. $87. Vol. 2, xxi pp. + pp. 809–1454, illus. + plates and index. $70.25.

The paleontology of microscopic organisms of the open ocean constitutes the most valuable part of the memory of the deep sea. Probing of this memory—by piston coring since the Swedish Deep Sea Expedition of 1947–1948, and since 1968 by deep-sea drilling from the *Glomar Challenger*—is rapidly changing our understanding of the role of the ocean in the evolution of climate and life on earth.

The cyclicity of the Quaternary climate, first demonstrated in the '50's, has now been definitely linked to the "Milankovitch" mechanism. The temperature fields and the circulation of glacial seas have been mapped as a first step for climatic modeling. The history of Cenozoic oceans is gradually emerging from paleontologic and isotopic studies and from preservational analysis. Mesozoic oceans are next, promising a glimpse of an entirely different system, with sluggish circulation and low oxygen content of deep waters. The stratigraphy of pelagic microfossils, established in the '50's and since refined, is the crucial tool for interpreting the drilling results: it was the stratigraphers who provided the time scale for those clever plots showing that distance to ridge crest increases with age, that sedimentation rates change through time, and that the record contains many gaps—as yet unexplained.

The structure of the book at hand suggests that the editor had in mind a treatise providing a comprehensive account of the state of the art both in paleoceanography and in the biostratigraphy of plankton remains. The book contains contributions of several kinds.

A handbook aspect is realized in a number of papers on the taxonomy and stratigraphic use of pelagic microfossils (foraminifera, radiolarians, coccoliths, dinoflagellate cysts, silicoflagellates). In the main, these papers are written by leaders in their fields (W. A. Berggren, W. R. Riedel and A. Sanfilippo, E. A. Pessagno, W. W. Hay, G. L. Williams, E. Martini). The stratigraphically oriented papers constitute just over 60 percent of the work (930 pages), with an immodest 430 pages for a catalog of Mesozoic foraminifera (from marine sediments on land) by B. Masters. The treatment of Cenozoic foraminifera falls short: instead of a review, a report of a leg of the Deep Sea Drilling Project was included.

A number of the papers (including some of the stratigraphic ones) are reviews of broad interest. A. W. H. Bé gives a thorough summary of the ecology, zoogeography, and taxonomy of living planktonic foraminifera and (with R. W. Gilmer) provides a similar overview for pteropods. R. E. Casey summarizes radiolarian ecology, J. van Donk surveys the use of oxygen isotopes, and A. T. S. Ramsay, the editor of the book, closes with a chapter on Tertiary paleoceanography. These reviews (about 400 pages) add up to a little over one-fourth of the book.

The remaining papers (about 200 pages) give a sampling of current research in the field. One focuses on the Quaternary oceanography of the North Atlantic (W. F. Ruddiman), three address the question of distribution of Recent coccoliths (S. Honjo, K. R. Geitzenauer *et al.*, N. Schneidermann), and one treats computerized biostratigraphy (T. R. Worsley and M. L. Jorgens). Not surprisingly, the excitement of the youngest offspring of biostratigraphy—paleoceanography—comes through in the papers in this last category. In the contribution by Ruddiman, for example, the special character of the North Atlantic as a climatic amplifier system is beautifully displayed in the deglacial retreat of polar waters, from a position at the Iberian peninsula back toward Greenland.

Ramsay's contribution to the work summarizes an immense quantity of raw data from the Deep Sea Drilling Project volumes, emphasizing fluctuations of the CCD (calcite compensation depth) and hiatus fluctuations. The CCD fluctuations are becoming ever more enigmatic. The simple idea of basin-shelf fractionation (with carbonate accumulating on shelves during transgression and therefore not available for the deep sea, and vice versa) is attractive. However, it has received a severe blow from the recent compilation of global oceanic sedimentation rates showing low values during the Oligocene, which is a time of regression and of a deepened CCD. It appears, therefore, that to explain CCD fluctuations we must look not only to mass balance but to the shape of saturation profiles and to bottom water flow. Ultimately, the fertility of the ocean and the intensity of deep circulation are probably the best candidates for agents of CCD variation.

The study of hiatus distribution through time is an entirely new departure in deep-sea stratigraphy and is of great conceptual importance. Ramsay's efforts in this direction are to be highly commended. T. C. Moore and co-workers, who presented results on hiatus stratigraphy in 1974 at the Conference on Marine Plankton and Sediment in Kiel, have made considerable progress in this field.

While Ramsay's contribution is impressive in scope and originality, he could have done better as an editor. Besides the—perhaps—unavoidable typesetting errors, there are some serious difficulties. For example, figure 7 and table 1 of the chapter on Recent radiolarians are incomprehensible—it is not clear where the information comes from. The illustrations in the chapter on Paleogene foraminifera are substandard; some have to be looked at with a hand lens. This is carrying the "micro" thing too far. These (and other) problems, such as the lack of information on diatoms and benthic foraminifera, tend to detract from the basically appealing makeup of the work.

There is no question that micropaleontologists and historical oceanographers will want to have access to this book and that professors will want to assign certain chapters to their graduate students. I have been giving Bé's chapter to my students for the last four years, in preprint form. It is still essentially up to date. Time has not been as kind to some of the other papers.

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Magnetochemistry

Magnetic Properties of Transition Metal Compounds. RICHARD L. CARLIN and A. J. VAN DUYNEVELDT. Springer-Verlag, New York, 1977. xvi, 264 pp., illus. $18.80. Inorganic Chemistry Concepts, vol. 2.

Frequently, magnetic properties of transition metal compounds are measured by chemists who are seeking information about the substances they encounter in the investigation of fundamental chemical problems. Often, simple measurements made with the most rudimentary equipment provide all the information necessary to answer the questions at hand, and meaningful research programs continue advantageously with such results.