The Research Situation in West Germany

Forschung in der Bundesrepublik Deutschland. Beispiele, Kritik, Vorschläge. CHRISTOPH SCHNEIDER, Ed. Verlag Chemie, Deerfield Beach, Fla., 1983. xvi, 976 pp. $41.

The title and format of this lengthy but surprisingly readable compilation suggest a routine, discipline-by-discipline review of the status of West German science. In fact, this book is much more important and revealing. The leaders of the Deutsche Forschungsgemeinschaft (DFG, German Research Association) have produced a volume laced with penetrating insight into the difficulties faced by current German researchers; it will be both praised and condemned within the ongoing controversy over the disenchanting quality of West German science.

In the immediate aftermath of the Third Reich, the Germans faced the combined impact of the forced emigration of thousands of talented researchers in the 1930's, the wartime devastation of personnel and facilities, and the intellectual isolation that persisted into the postwar period. As the postwar economy strengthened and West Germany regained a measure of its place in international affairs, research conditions began to improve. Efforts to construct a coherent science policy, however, were confounded by federal claims to manage the economic implications of science and state claims to administer its educational and cultural elements. Eventually, in the 1950's, a division of labor emerged whereby the states supported institutions whose functions included teaching (notably the universities and institutes of technology) and the state and federal governments jointly funded research organizations and institutions of supraregional significance (among them the network of Max Planck Society institutes, the DFG, and the Grossforschungseinrichtungen—Big Science establishments—such as the space program, the nuclear research center at Karlsruhe, or the electron-synchrotron facilities at Hamburg). Coordination and long-range planning were entrusted to a Science Council of notables representing all interested parties. This was an extremely complex process, since numerous coordinating bodies were erected to aid communication and generate consensus, and there were also scores of lesser laboratories and organizations (not to mention industrial facilities) to be fitted somehow into the scheme. Although organizational structures have flourished, substantive achievements and international competitiveness have not seemed to return to pre-Nazi heights.

One of the reasons is that the once-vaunted universities have become the Achilles heel of the German research enterprise. Reforms initiated in the 1960's were designed to grant broader access to higher education and break down the often overweening authority of the full professors. Developments included both rapid expansion of the university system and entry of the federal government (from 1969 on) into planning and funding procedures. The result for science has been at best problematic—the universities are overcrowded, bureaucratically stifled, underfunded, and simply not as attractive to the best young researchers as the laboratories of the more politically insulated Max Planck Society institutes. The fear is that the universities—the training ground for the coming generation—will deteriorate, while other institutions fare rather well.

The generic difficulties of maintaining an effective scientific research base in a time of economic downturn have made the German situation of interest abroad, especially in Britain, as a recent succession of major articles in *Interdisciplinary Science Reviews*, *Nature*, and *The New Scientist* attests. Creating positions for the young and embarking on university-industry-government ventures in high technology are two solutions currently being pursued in the Federal Republic. Yet the overall impression of the German research enterprise is one of tentativeness and a lack of ability to move the unwieldy system toward improvement.

Immobility does not stem from a lack of ideas. A plethora of theoretical and programmatic works has combined with frequent structural reorganization—the Federal Ministry of Research and Technology has had six different names and redefinitions since 1955—to produce a morass of competing conceptions and instruments for change. There are so many ideas that there are few clear lines of debate, although a general division exists on whether to spread research funds around widely or to support best science (*Spitzenforschung*) disproportionately.

The present volume documents the DFG's position on behalf of best science. Ever since it was founded as an emergency association in the aftermath of World War I, the primary purpose of the DFG has been independent and impartial dispensation of government grants to individuals and research teams. Its interests encompass basic and technical research in the physical, biological, and social sciences plus the humanities (rather like a combined National Science Foundation, National Institutes of Health, and National Endowment for the Humanities). The DFG is thus directly concerned not only with discussing the state of German science but with doing something about it.

Publication of this book as a reflection of the DFG's concern indicates the impasse that has been reached. Rather than take an overtly political stand or add yet another programmatic treatise to the list, the notion here is to present an argument for what constitutes good research by an empirical method: nearly a hundred scholars, scientists, and engineers were asked to reflect on their own fields and careers and then suggest improvements. Their memoranda—a more apt designation for the contributions than "articles"—are thus largely autobiographical, often quite personal. (The sequence of represented disciplines—from Roman archeology through history, literature, the social sciences, biological and medical disciplines, chemistry, and physics eventually to machine tools and transportation technologies—may appear confusing but roughly follows the organization of grant proposal offices in the DFG.) The result is at times trivial, but more often refreshing, sobering, and thought-provoking. It is an effort not to map the research forefront or to poll the representatives of best science but to provide a sense of the wellspring of German creativity and quality in science.

Many themes that emerge in this book are predictable. A number of authors stress the role of accident in good research, and several others emphasize that too much planning and inflexible paperwork accounting are antagonistic to the freewheeling imagination essential to discovery. Some note an unwillingness to take risks and follow bold new thought rather than safe, incremental advancement.

But other observations are arresting. A molecular biologist, who had studied at Caltech with Max Delbrück and turned down offers at Caltech, MIT, and Bell Labs to stay in Germany in 1960, offers that perhaps too many Germans learned their postwar science abroad and have never broken away to follow their own German paths. An organic chemist suggests that today's funding allows for enormous institutes that are inherently unmanageable but perhaps as characteristic for our age as cathedrals were for another.

The essays that bracket this collection are of particular interest. The introduction by the physicist Heinz Maier-Leibnitz, past president of the DFG, shows how much the format owes to his own personality. His tone is distinctly humanistic. He emphasizes how one can see what made so many of these authors successful researchers, how many of them refer to their own teachers (as he has often referred to his tutelage under James Franck in Göttingen before 1933), and how often they are caught between what they want to do and what they feel they are constrained to do in the daily administration of their institutes or laboratories. It is clear that to him research is more vision than logic and science administration is more like tending a garden than running a machine. Each researcher needs a different kind of nurturing appropriate to his personality and the standards of his discipline.

The concluding essays by the editor of the volume, Christoph Schneider (head of the planning staff of the DFG), and the current DFG president, the geologist Eugen Seibold, try to come to some conclusions based on the memoranda. They focus on the importance of transmission not only of information but also of style, values, and a sense of community from one generation of researchers to the next. They then note the contrast between favorable research conditions described by those outside the universities and relatively poor conditions lamented by those in them and point out that for many researchers teaching the younger generation is perceived as a secondary activity. Yet they do not confront the conflict between the importance of value transmission and the desire of excellent researchers to relegate teaching to the background. Instead of just expanding research opportunities directly, it would seem that some effort to make teaching more rewarding and less harried would be called for.

Schneider and Seibold carefully draw attention to the appearance of the word "elite" in the essays of numerous authors. It is claimed that financial support for individual researchers, the capabilities of specific universities, and personal recognition are all areas in which egalitarian pressures have worked against first-rate research. The thrust of their comments is in effect to revert to the tradition begun by Wilhelm von Humboldt at the opening of the 19th century: pick a proven scholar full of curiosity, determination, and a sense of direction, support him, and let him follow his head. This is not a suggestion likely to find resonance among those on the left who have been fighting for nearly two decades to constrain the liberty of those in older positions of authority. Whether the conservatives currently leading the government are inclined to restore some of that liberty remains to be seen.

Finally, the book concludes with a concern for the relationship between the individual and the broader research community. Interdisciplinary contact is desirable, exchange of ideas between Max Planck Society researchers and university teachers is encouraged, and participation in international forums is essential. Yet, Seibold holds, in the final analysis it is the individual who discovers something new and who then communicates it to the young: the personal interactive process is the heart of research, and to further it is the greatest challenge to the cumbersome machinery of science policy and administration in West Germany today. Seibold has begun to lobby for the creation of more permanent positions for young researchers. At the annual meeting of the DFG just held in June, his call for action to replace endless discussion was underscored by support from Federal Chancellor Helmut Kohl and various education officials.

Yet for all the openness this compilation of internal memoranda displays, there seem to me three problems skirted in the essays that would have to be confronted to improve the quality of West German research. The first is illustrated by the fact that, of 97 memoranda representing as many different fields, only one is by a woman. It is not clear how a return to older attitudes would change this ratio and tap the potential of the female German population. The second is that in an attempt to balance the claims of all interested parties an equilibrium has been reached, leading to a widespread sense of futility. This is not a phenomenon peculiar to the Germans, of course, but it involves some awkward questions in a country where strong leadership is still suspect. The third problem is that too few observers seem to notice that the level of science in West Germany today is not compared to that of West Germany prior to 1933. It is compared instead to a Germany that now includes both East Germany and major portions of Poland. It is clear that many West Germans are still not reconciled to the fact that the Federal Republic cannot be expected to measure up to that which all of erstwhile Germany could accomplish. This false comparison demonstrates a burden of the past that has yet to be overcome and that is not only the source of much of the disenchantment surrounding West German science today but also a barrier to the creation of a new research tradition truly characteristic of the Bundesrepublik.

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Reproductive Behavior

Parental Behaviour of Rodents. R. W. ELWOOD, Ed. Wiley-Interscience, New York, 1983. x, 296 pp., illus. $49.95.

It is appropriate in this 50th anniversary year of the publication of Wiesner and Sheard's germinal monograph, *Maternal Behaviour in the Rat*, to review a half-century of progress in the laboratory study of parental behavior in rodents. The intervening years have witnessed both increased sophistication in the observation and description of the components of parental behavior and more detailed and technically innovative analyses of the hormonal and stimulus control of the interaction of parents and young. In consequence, there is deeper understanding of all the phenomena discussed in Wiesner and Sheard's pioneering work, as well as a range of new facts about and approaches to the study of rodent reproduction.

Elwood's volume, comprising 10 chapters by 11 authors, provides largely descriptive reviews of many of the actively studied aspects of reproductive behavior in laboratory rodents: development of maternal behavior (Mayer, Priestnall), effects of hormones and pup stimulation on the onset and maintenance of maternal behavior (Rosenblatt and Siegel), analysis of communication between adults and infants (Elwood and McCauley, Porter), maternal aggression (Ostermeyer), suckling and the physiology of lactation (Drewett), and the role of maternal nutrition in pup development