BOOK REVIEWS

Research in the Third Reich

Surviving the Swastika. Scientific Research in Nazi Germany. KRISTIE MACRAKIS. Oxford University Press, New York, 1993. xiv, 280 pp. + plates. $39.95 or £40.

Science, Technology and National Socialism. MONIKA RENNEBERG and MARK WALKER, Eds. Cambridge University Press, New York, 1993. xx, 422 pp., illus. $59.95 or £40.

Adolf Hitler abhorred much about modern life, including large cities, liberal democracy, and modern art. But modern science and technology called forth a different reaction. Hitler was one of the first German politicians to see the symbolic and practical importance of campaigning by airplane. He used radio to cajole and charm the German people into rearmament and eventually into another world war. During the later stages of that conflict, his underlings promoted a number of projects aimed at providing wonder weapons to snatch victory out of approaching defeat. Hitler and the Nazis may not always have used modern science and technology either effectively or to desirable ends, but they enthusiastically embraced the products of scientists and engineers.

Given this enthusiasm and fascination on the part of Hitler and his regime, it is astonishing how little historians have written about science and technology under National Socialism until recently. The two books at hand provide valuable contributions to the emerging literature on this crucial subject and indicate some future directions for research.

Kristie Macrakis delves into the history of Germany's most prestigious scientific institution, the Kaiser Wilhelm Society (Kaiser-Wilhelm-Gesellschaft, or KWG), which operated a wide variety of institutes devoted to basic and applied scientific research between 1911 and 1945. (Its successor in West Germany is the Max Planck Society.) She finds that the KWG retained a surprising amount of freedom of movement and autonomy between 1933 and 1945, despite Nazi aims of total control of German society and its institutions. Because of this extensive independence, "much high-quality science existed at the Society" throughout the National Socialist period (p. 4).

Even in the most politicized area of basic research, biology, Macrakis finds that ideology made few inroads. She notes that "scientists continued to do important work in the life sciences" in the Nazi period, pointing in particular to "Kühn's work in developmental physiology, Wettstein's in cultivated plants, Hartmann's on sexuality in protozoa, . . . Butenandt's . . . in sex hormones and virus research, and Timoféeff's in mutation genetics." Eugenics and other "racial sciences" flourished during the period, too, of course, but Macrakis argues that "eugenics was not a product of National Socialist Germany" (p. 130): German eugenics was part of a worldwide movement that had started before 1933; the Nazis simply used it to legitimate their racial policies.

The Kaiser Wilhelm Institute of Chemistry, Berlin-Dahlem, after an air raid in February 1944. [From B. Weiss's chapter in *Science, Technology and National Socialism*; courtesy of the Archives of the Max Planck Society, Berlin-Dahlem]

Macrakis does not argue that the KWG emerged from the Nazi period unaffected; in fact, the Society changed fundamentally between 1933 and 1945, most notably in its reorientation toward extensive war-related research and industrial applications. But she parallels her arguments on eugenics by suggesting that some of these changes were not necessarily peculiar to Nazi Germany: reorientation away from the prewar mission emphasizing basic scientific research may be a phenomenon shared by the KWG with advanced scientific institutions in other countries engaged in the war, whether they were democracies or dictatorships (pp. 7, 204). In making this argument, however, Macrakis avoids addressing the question of how the special importance of war-making in Nazi ideology might have differentially affected the KWG during World War II.

Macrakis's arguments are based on an impressive array of archival and secondary sources, and her interpretations of the evidence fit well with those of other historians that establish continuity from the Weimar period through the Third Reich and into the postwar period, that emphasize the complexity of pressures on and motivations of those acting in the Third Reich, that explore varieties of resistance and opposition and the limits of Hitler's power, and that see parallels between developments in National Socialist Germany and in other industrialized countries at about the same time.

Still, there is a danger of misunderstanding inherent in such claims. Does emphasis on complex pressures and motivations affecting individuals shift our attention away from issues of responsibility? What constitutes meaningful resistance and opposition to authoritarian rule? What was the distinctive stamp that National Socialism put on German society and its institutions?

Many of the German and American contributors to the superb collection *Science, Technology and National Socialism*, edited (and with a fine introduction) by Monika Renneberg and Mark Walker, address these questions directly. Herbert Mehrtens's concluding essay "Irresponsible purity: the political and moral structure of mathematical sciences in the National Socialist state" seeks to refocus attention on the issue of the responsibility of the scientist. Mehrtens suggests provocatively that one problem with science during the Nazi period was that scientists pursued "pure science" and "pure science is irresponsible" (p. 336).

Ulrich Albrecht's fine piece on military technology and National Socialist ideology also makes controversial claims in arguing that there were distinctive features to Nazi military technology. Examining the designs and products of aeronautical engineering from the end of the war, Albrecht finds "exceptional characteristics such as de-

manding Herculean pilot performance, the lowering of recruitment age, suicide weapons and hypertrophic vengeance weapons" (p. 96).

The impetus for Albrecht's essay is his irritation at the tendency to glorify German achievements in arms technology at the end of the war. Referring to one case in particular, he notes, "The literature often prefers to describe the failure of the demonstration flight of the people's fighter in 1944 as an annoying trifle—without the slightest appreciation of the fact that, taken together, poor cement, insufficient gluing techniques and wooden jet fighters symbolically mirror the hypertrophy of technological development in the decaying Third Reich" (p. 123). Albrecht's claims are meant to be controversial, and they should provoke scholars to ask whether the kinds of technological developments he describes were the desperate products of a regime about to lose a war or were instead the logical and brutal expression of the essence of National Socialist ideology.

Such provocative essays are just part of a book that is the best overview of the subject available to date. It includes four essays on Nazi technology (a subject even less well explored than Nazi science) and a number of others on a variety of scientific disciplines and scientists. It brings together the foremost German and American specialists to sketch out the "state of the art" of historical research on science, technology, and National Socialism. The book also provides implicit and explicit challenges to scholars, suggesting the vast amount of historical research that remains to be done.

One such challenge is posed by Sheila Weiss, who contributes an essay on the teaching of biology in the Third Reich in schools during the National Socialist period. Given most historians' fascination with university research, one of the least obvious ways of studying science in the Nazi period is to examine the way it was taught in schools. Yet what was taught in schools affected virtually the entire population directly, while science and technology developed at universities directly concerned only a small (although admittedly important) elite.

Weiss's essay is a fine example of the kind of work that could be done for other sciences and for areas of technology (with regard for example to apprenticeship and vocational training). She describes the community of interests between biology teachers, who already in the Weimar Republic believed that they could make a unique contribution to training citizens and keeping them healthy if only biology were at the center of the school curriculum, and Nazi party officials, who were interested in using biology instruction to inculcate patriotism and racism into the citizens of the Third Reich. Neither side was ultimately satisfied with this relationship, since their goals were not entirely identical and the outcome of their cooperation was a compromise.

Still, the key point is that aspects of the biologists' program preceded and succeeded the Third Reich, indicating a complex mixture of continuity and change through time. For obvious ideological reasons, biology is a special case in the study of National Socialist science. What of other disciplines? Clearly, there were ways in which teaching of other fields of science and technology to those in elementary, vocational, and university-preparatory schools could shape German society in ways the National Socialists wanted; there were also tensions between teachers and party bureaucrats and both continuity and change in fields other than biology. How did the story unfold in each instance?

The place of technology in *Science, Technology and National Socialism* is also suggestive, both of how much has been done and of how much remains to be done. Four of the 15 substantive chapters deal with technology directly. All four address issues related to arms technologies, specifically in aeronautical engineering. This is reasonable given the limited scholarship thus far on the subject: the authors have chosen probably the most impressive technical accomplishment of the Third Reich, aeronautical engineering, and an area, armaments, that served as a focal point for National Socialist ideology. Still, one wonders what were the effects of Nazi rule on technologies in more traditional, less noticeable, less ideologically crucial areas.

These books represent some of the most impressive results of research by historians of German science and technology during the past decade. They explore the gray areas between resistance and accommodation to the National Socialist regime and between good and bad science. They connect well with more general political and economic historiography of National Socialism. They address issues of continuity and change that, in light of the recent political changes in the German area, take on heightened significance. And, in the best tradition of scholarship, the questions they provoke are as important as the answers they provide.

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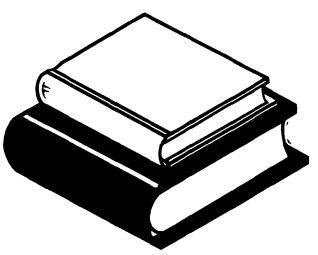

Vignettes: Medical Solace

Many diseases cause death. "We can cure those diseases," people say, "but we can't cure AIDS." Tell me, how many diseases can we cure? We cannot cure very many viral diseases, nor can we cure many of the diseases that kill people, like heart disease and forms of cancer. The concept of curing people is relatively new. The strength of physicians used to come from their capacity to accompany. Accompanying a person through an illness towards health or towards death was central to the practice of medicine, but it disappeared when the issue became one of curing.

—*Jonathan Mann*, in Thomas A. Bass, *Reinventing the Future: Conversations with the World's Leading Scientists* (Addison-Wesley)

In medicine many of the five patient office visits per year (the U.S. national average) are primarily to get reassurance that some symptom does not represent a life-threatening situation. Often such assurance can be given, or so I am told. We understand that the diagnosis reduces anxiety even when the news is bad. How can we summarize this reduction in anxiety as part of the benefit of the national medical program?

—*Frederick Mosteller*, in *Doing More Good Than Harm: The Evaluation of Health Care Interventions* (Kenneth S. Warren and Frederick Mosteller, Eds.; New York Academy of Sciences)