Engineers and Their Allegiances

Technical Workers in an Advanced Society. The Work, Careers and Politics of French Engineers. STEPHEN CRAWFORD. Cambridge University Press, New York, and Editions de la Maison des Sciences de l'Homme, Paris, 1989. viii, 284 pp. $49.50.

In the political ferment of the 1960s, a number of French sociologists, most notably Serge Mallet, developed the theory that technical workers constituted a "new working class." They rejected the traditional socialist view that blue-collar factory workers would be the backbone of leftist or radical politics. Instead, they saw technical workers as the natural constituency for a rejuvenated socialist politics, centering on the goal of "autogestion," or workers' self-management. Mallet and others believed that such workers were more likely to rebel against the constraints imposed by bureaucratic authority and profit-making because such constraints contradicted technical workers' skills, technical values, and responsibility on the job.

Stephen Crawford's *Technical Workers in an Advanced Society: The Work, Careers and Politics of French Engineers*, written 20 years after the events of 1968, is, in part, an attempt to test empirically the "new working class" thesis in the country where it was first enunciated. It also sets out to test and evaluate a number of other influential sociological theories regarding engineers and other professionals, ranging from the view that they are being "proletarianized" (that is, that their skills are being eroded by new technologies and managerial controls) to the view that they form part of a "service class" of trusted workers to whom employers delegate responsibility. Perhaps the most interesting aspect of Crawford's work, however, is that it is part of a larger, comparative study, carried out by three graduates of Columbia University, of technical workers in three industrialized countries. The interested reader should read this book in connection with the other studies, which have already appeared: Robert Zussman's *Mechanics of the Middle Class* (1985) on the United States and Peter Whalley's *The Social Production of Technical Work* (1986) on Great Britain.

Crawford pursues the same research strategy employed in these other studies. He selected two companies—a traditional metalworking firm and a "modern" electronics and telecommunications firm—and conducted interviews with a total of 129 engineers regarding their work, careers, and politics. In this way, he hoped to test whether the advanced sector really did house a radical new working class of technical workers and to make comparisons among French, British, and American industry.

There is little support in Crawford's findings for the new working class theory. Echoing the companion studies on the United States and Britain, he concludes that there were relatively few differences between engineers in the metalworking and telecommunications firms; what differences there were are explained in terms of factors other than the industry's "advanced" or "traditional" character. Nor is there much evidence of radicalism among French engineers. Though some are more leftist than their British or American counterparts, they tend to accept the legitimacy of management and profit-making and show little interest in "autogestion."

The cross-national dimension of the study yields more interesting results. Crawford makes much of the fact that many French engineers are classified as "cadres," a legal category with certain rights and privileges in French society. This, plus the traditional career path from the "grandes écoles" through engineering into management, tends to tie many French engineers to management. By contrast, Whalley found a less managerial orientation among British engineers, in part because of their relative lack of formal training. Zussman argued that American engineers see themselves as part of a "working middle class" that includes blue-collar workers, in part because of mixed-occupation residential and home ownership patterns. All three studies make a strong case that engineers' sense of their place in the class structure is formed away from work at least as much as it is at work.

Crawford's focus is clearly on the politics of engineers and rather less on their work itself. He does not try to provide a detailed description of what French engineers do or how their work lives compare to those of engineers in other countries. As a result, there is not much here that would shed light on debates regarding the best conditions for promoting creative, high-quality engineering. Nevertheless, Crawford's book, along with the other two national studies, suggests strongly that making engineers happy may not be so difficult as it is sometimes made out to be. The portrait of engineers that emerges from this research is of a group of employees who wish to be allowed to decide how to do their jobs, who want a bit more influence over decisions that affect them directly, and who accept the need for some kind of managerial coordination (indeed, they resent nothing more than a "bad" manager). Discontent seems to be concentrated largely in individual firms or workplaces, or at the lower levels of the technical hierarchy. For the time being, at least, French engineers, and their British and American counterparts, appear relatively content.

There are some stormclouds on the horizon, however. Crawford points, for example, to the rapid expansion of lower-level engineering jobs staffed mainly by graduates of the less prestigious engineering schools as well as to the growing instability of industrial employment resulting from technical change and international competition. He is generally inclined to dismiss the view that the position of the engineer is being eroded in any significant way; time will tell whether he is right to minimize the potential threat.

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Sciurid Sociality

Marmots. Social Behavior and Ecology. DAVID P. BARASH. Stanford University Press, Stanford, CA, 1989. xviii, 360 pp., illus. $49.50.

Barash notes that appealing features of marmots as study subjects include their "good grace to hibernate during the academic year" and their tendency to live "at or above timberline in some of the world's most beautiful mountains." More important, marmots are the largest members of the ground-dwelling sciurids and, like their smaller relatives, the ground squirrels and prairie dogs, they are diurnal, sedentary, and occupy relatively open habitat. Consequently, they are ideal subjects for observational studies that focus on activity budgets, social behavior, social organization, and population biology. This book compiles such information, primarily garnered from studies conducted since the early 1970s.

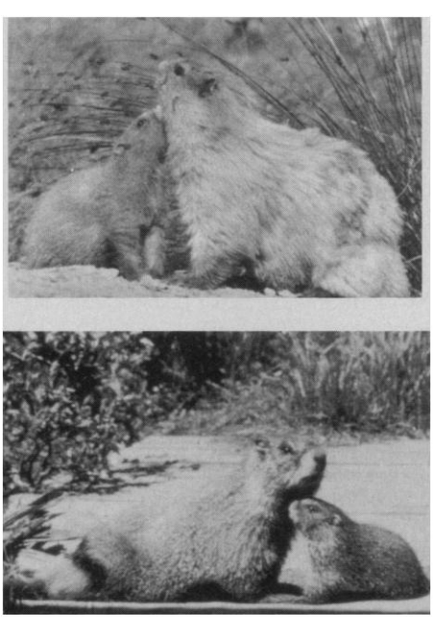
Barash's approach is avowedly sociobiological. Because studies of Eurasian marmots tend to emphasize habitat description, anatomy, and economic impact, the treatment necessarily is focused on those North Ameri-

can species that have attracted researchers interested in interpreting behavior and ecology from an evolutionary perspective. Thus, Olympic marmots, hoary marmots, yellow-bellied marmots, and woodchucks, each of which Barash has himself observed, are the star species. In addition to rereporting his own previously published data and drawing on published studies of other researchers, Barash reports on his unpublished studies and reinterprets his previous work. The hitherto unpublished data are particularly welcome, as Barash has not published material from his marmot studies since 1981. The new information includes data he collected during 994 hours of observation of woodchucks from 1971 to 1973. Readers searching specifically for this material will, however, be somewhat frustrated, as it is scattered throughout the book and woodchucks are not listed in the index except sporadically under other headings. Fortunately the book is well written and informative, so reading through large sections to glean specific information is rewarding.

Though about a quarter of the book is devoted to rereporting of his earlier work, Barash gives minimal reference to the earlier publications. For example, the discussion of greeting (pp. 79–84) is taken verbatim, along with three figures, from Barash's 1973 publication in Animal Behaviour Monographs, of which there is no citation. The only material not from that publication is photographs of marmots engaged in greetings that were the source for the earlier drawings. Readers who have read the original articles will experience a sense of déjà vu at many points. The comprehensive coverage of studies spanning four North American and one European species between 1967 and 1986 will, however, be convenient for readers previously unfamiliar with Barash's work.

This book is not a collection of anecdotes, but rather is intended for the serious reader interested in marmot social behavior and ecology in particular and the development of general theories on the evolution of sociality within a taxonomic group in general. Enough explanation of concepts such as kin selection, intrasexual competition, and parent-offspring competition is given to convey the context in which the data are being interpreted. Although the book is written from a sociobiological perspective, Barash does not force the data to his predictions, admits when the data contradict them, provides alternative explanations even when the data are in accordance with them, and adjusts for confounding variables that may be responsible for apparent agreement between expectation and observation. Furthermore, he notes where sample sizes are so small that biological conclusions are weak or tentative. Barash avoids simple interpretations and delves into the complexity of identifying factors underlying behavioral and ecological phenomena. For example, in accounting for why females of the montane species sometimes skip two consecutive years of reproduction, Barash considers the effects that weather and habitat may have on food availability, in addition to the effects of density of conspecifics, which in turn may be influenced by the age, social status, reproductive status, and kin relationship of those animals to the nonreproductive female.

The book is well organized, with a logical progression of topics. It begins with a brief account of taxonomy and distribution, then takes up behavior in general, social and reproductive behavior, kinship associations, and population biology, and concludes with a discussion of the evolution of sociality in marmots. The last, presenting a refinement of a hypothesis Barash first presented in *Science* in 1974, also compares and contrasts the selective pressures thought to drive sociality in marmots with those proposed in the 1980s by other workers for ground-dwelling squirrels. The text flows well, in part because information about the statistical tests used and their results is presented in footnotes (purists may wish the test statistic and degrees of freedom were also included). The list of summary and conclusions ending each chapter permits quick review of its contents. The black-and-white photographs liberally sprinkled through the initial chapters help convey a sense of marmot behavior that cannot come from words alone. Among the few minor errors in the book are the consistent misspelling of the names of L. Rayor and K. Holekamp.



Young marmots initiating greetings with their mothers. *Top*, Olympic marmot; *bottom*, yellow-bellied marmot. [From *Marmots: Social Behavior and Ecology*; photographs by D. P. Barash and courtesy of U.S. National Park Service, respectively]

This book serves several purposes. It provides a readable compendium of information, some of which is otherwise unavailable, on the behavior and ecology of marmots, it exemplifies the utility of studying several closely related species to generate theories on the evolution of sociality, and it identifies species and topics that would be particularly fruitful for future researchers to follow.

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Bee Biology

Ecology and Natural History of Tropical Bees. DAVID W. ROUBIK. Cambridge University Press, New York, 1989. x, 514 pp., illus. $69.50. Cambridge Tropical Biology Series.

This is a unique book in its view of tropical biology as seen from the perspective of bees. Studies such as this one take on added importance as tropical habitats rapidly disappear; the interactions and associations described here may not exist for much longer. Roubik has drawn together themes of ecology and natural history in this thorough treatment of tropical bees. His book is also valuable because it is the first broad review of bee biology since Michener's classic *The Social Behavior of the Bees*, published in 1974, and contains much new information on this important group of insects. In fact, social bees predominate in Roubik's book as well as in Michener's, perhaps because relatively little is known about solitary tropical bees. The section on predators, parasites, and pathogens of bees is particularly novel, and the long section on community ecology provides much useful information concerning the structure of tropical bee communities. *Tropical Bees* contains notably complete index and reference sections and some spectacular illustrations, particularly those done by Camargo. There also are great adaptation "stories" here, to remind us of how exotic the tropics can be, such as the accounts of meat-eating bees and bees whose nests survive under water for much of the year.

Roubik's scholarly book is not for the casual reader, however; the writing is dense, tending toward overly detailed descriptions that can make for tedious reading. In some places this book meanders, particularly when Roubik wanders from descriptive nat-