

U.S. Agricultural Science

Science, Agriculture, and the Politics of Research. LAWRENCE BUSCH and WILLIAM B. LACY. Westview, Boulder, Colo., 1983. xvi, 304 pp., illus. Cloth, \$30; paper, \$12.95. Westview Special Studies in Agricultural Science and Policy. Rural Studies Series of the Rural Sociological Society.

Rachel Carson's environmental critique, *Silent Spring*, probably established the basis for what was to become burgeoning criticism of U.S. agricultural science during the 1970's. In 1972, the "Pound Report" (*Report of the Committee on Research Advisory to the U.S. Department of Agriculture*) of the National Research Council provided general criticism of the quality of agricultural science; one year later, Hightower's *Hard Tomatoes, Hard Times* criticized land-grant science's linkages and subservience to agribusiness and its concomitant contribution to the disappearance of small-scale farming and rural communities. The 1982 "Winrock Report" (*Science for Agriculture: Report of a Workshop on Critical Issues in American Agricultural Research*) is one of the latest indications of dissatisfaction with the current organization of publicly funded agricultural science. Along the way this criticism has taken litigious form with a suit by California Rural Legal Assistance against the University of California for its agricultural mechanization research, which, it has been contended, narrowly benefits large-scale agribusiness rather than other interests.

Most analyses of U.S. agricultural science have been historical or institutional. The present study by Busch and Lacy constitutes a significant departure, deriving most of its material from a mailed questionnaire to over 1400 agricultural scientists. Using other methods of data collection, including in-depth interviews with scientists at several institutions as well as a mail survey of 92 editors of agricultural science journals, the authors also draw on primary and secondary historical materials as well as documents emanating from agricultural science disciplinary associations. Though the conceptual approach and basic organization of the study derive from the qualitative research methods, the bulk of the volume is devoted to reporting quantitative results and to buttressing arguments with qualitative comments from respondents.

The authors have drawn their sample from scientists reporting through the U.S. Department of Agriculture's Current Research Information System (CRIS). Since CRIS handles only publicly funded agricultural research, agricul-

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tural scientists in the private sector remain unsurveyed, but the study provides a substantial panorama of agricultural scientists working in the public sector.

In terms of social characteristics, there are proportionately fewer women and minority members among agricultural scientists than among non-agricultural scientists. Agricultural scientists tend to be older than other scientists and, although the proportion is declining, more still come from farm backgrounds. Land-grant institutions provided 90 percent of the doctorates of public-sector agricultural scientists, and a dozen universities account for nearly three out of five of their doctorates. Though concentration in doctorate production is also characteristic of the non-agricultural sciences, it is more pronounced in the agricultural sciences. Indeed, the insularity of the agricultural sciences noted by the Mayers in 1974 (*Daedalus* 103, No. 3, 83-95) is confirmed statistically by Busch and Lacy.

The major focus of this study, however, is on "Why do agricultural scientists do what they do?" Answers are provided through six clusters of variables: family origins, backgrounds, and education; research orientation (that is, basic or applied); the systems of formal and informal communication; the influence of disciplines and journals; the immediate organizational contexts within which the scientists function (universities and government); and extraorganizational influences ranging from public agencies such as the National Science Foundation and the Environmental Protection Agency to narrowly focused commodity groups, marketing orders, and private organizations and firms.

Five of these clusters are treated in separate chapters (research orientation, which is pervasively treated, is initially included in the chapter on background data), which provide considerable quantitative detail on choice of research problems. The major finding of this study is that research problem choice is "extraordinarily complex." The authors set out a schematic conceptualization of the relations among the variables early in the study, but the analytic method of reporting clusters of variables tends to insulate each from the others. The consequence is to leave the reader uncertain how to weight interrelations, that is, to judge which influences predominate and under which conditions. Some answers are provided to this question. Thus junior scientists, concerned about tenure, are more sensitive than their seniors to "hot topics" and to extraorganizational fund-

ing sources to get their research programs under way. Similarly, some disciplines within the agricultural sciences are more geared to clientele concerns than to basic disciplines.

A different issue emerges when the quantitative results of the survey data are compared with qualitative responses from respondents as well as with historical and institutional data. This is a classic issue of social research, the relation between perceptions and self-reports on the one hand and observed behavior in institutional settings on the other—that is, between what people say they do and what they actually do. Thus, whereas the mean scores for the reported motivations "enjoy doing this kind of research" and "importance to society" are higher than those for motivations such as "publication probability," "client needs as assessed by you," "funding," and "demands raised by clientele," the qualitative comments by respondents deplore the emphasis given to publication and the importance of external funding sources. And, despite the reported limited contact between scientists and cli-

ents, clients are the group most frequently reported as influencing choice of research problem (pp. 92-93).

Busch and Lacy devote considerable attention to the differences among disciplines in the agricultural sciences. These differences not only are treated historically and institutionally but show up as important in the quantitative data. These findings feed directly into much of the critique of the agricultural sciences: some disciplines are far more oriented to constituency and client interests than to the basic disciplines from which they derive. Unfortunately the client-focused disciplines tend, all too frequently, to generate public attention when experiment station and extension directors justify budgets to legislators on the basis of the increased "efficiency" of agriculture. Busch and Lacy do not address this continuing tension, but their complex discussion of the agricultural sciences bears centrally on this controversy.

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A Force in American Medicine

The Sick Citadel. The American Academic Medical Center and the Public Interest. IRVING J. LEWIS and CECIL G. SHEPS. Oelgeschlager, Gunn and Hain, Cambridge, Mass., 1983. xxiv, 264 pp. \$25.

The American academic medical center, considered in agglomerate, is a mighty institution, and this book traces its origin, development, present status, and possible future. The academic center provides almost all the science, develops almost all the new technology, and trains almost all the practitioners in medicine. In a curiously unappreciated way, it therefore dominates health concepts and medical practices. As a force, it can stand up to government or ignore the medical consumer. Lewis and Sheps argue that it has done both and that this unrestrained colossus has grown in directions unaligned with the public interest. The terms from the title, "citadel" and "sick," have each been chosen with some care. Philip Lee adds a balanced and insightful foreword.

The critique is developed with scholarship and understanding. Public policy for health care, as opposed to more random entrepreneurial and market forces, is traced from humble 19th-century beginnings to a present scientific imperative

based upon proven bioscientific knowledge and tempered only slightly by concerns about equity and cost. The American academic medical center is traced from its origin in medical apprenticeships, through the Flexnerian restructuring, to the present state. The wavering role of patient care as a primary mission of the academic center is described in the context of the forces that push and pull, with the conclusion that this mission is clearly in third place, behind research and teaching. The educational role of the academic center is similarly explored and a mismatch identified between public need and training material, between how educational time is divided and how professional time will be spent.

Primary care and geriatrics are presented as underemphasized subjects. The irrationality of "physician shortages" followed by "physician gluts" is identified, although the authors remain concerned about problems of maldistribution of physicians, both among geographical regions and among subspecialties. The growth of the academic medical center into "big business," its financing, and its governance are traced. In perhaps the most damning indictment of this growing agglomerate, no one is found to be in charge.