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 funding 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 clients, 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.

Finally, the authors suggest reforms. Ultimately, this volume must be judged by its conclusions, and the recommendations of the authors are far-reaching. The book begins with the proposition that the role of the academic medical center is far broader than biomedical research alone, that government cannot acquiesce easily to requests for larger and larger sums for research, and that government, presumably representing the people, and the academic center, presumably dedicated to the public interest, should become allies rather than adversaries. The concerns of public policy remain in the authors' view equitable access, cost containment, physician surplus, runaway technology, and the need for rational regional organization of health services. The academic center is seen in social conflict with each of these concerns.

Four conclusions are offered. First, the academic medical center is a new, critical, and very real force. Second, it must develop a new mission, that of service to the surrounding locale. Third, someone must run it. Finally, it must develop planning and financial resources that will enable it to meet changing priorities over time.

These arguments are strong. There is indeed a major force represented by the academic medical center, and if anyone is in charge his or her identity is certainly not clear to this reviewer, who also sees growth by economic opportunism as dominating any consistent approach toward any defined institutional goals. The technology is indeed runaway, often wasteful, and almost always unevaluated and follows a technological imperative rather than a clinical need. The criticism could have been extended to include a preoccupation with curative rather than preventive approaches, emphasis on disease rather than host, and ignorance of behavioral and social antecedents of disease.

The strengths of its criticisms notwithstanding, there is an annoying political undertone to the book, and it arrives at disturbingly predictable recommendations without any serious discussion of alternative models for citadelian cure. The potential role of health services research in providing feedback about social impact to the originators of new technology is scarcely discussed. It is not clear whether the authors would decrease the biomedical commitment (quite likely this would be a bad idea) or increase the overall mission of an already overgrown institution. The community services required, and the educational structure to support them, could be served by peripheralization of the center as well as by centralization. There is scant discussion of the actual nature of the health burden of chronic disease, and the question of the quality of care, measured against patient outcome, never seems to come up. There are many such legitimate issues, and the ultimate failure of this book is that it is a brief for a particular (though possibly correct) set of solutions without adequate discussion of the alternatives.

The academic medical center requires examination. What is it? What does it do? And what should it do? This book opens a dialogue. Meaningful change in medical paradigms cannot easily occur without changes in the underlying institutional structures. Those interested in health policy, in medical education, in the quality of medical care, and in the national health care cost are well advised to carefully evaluate the arguments presented here.

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Underdevelopment: Test of a Theory

The Pharmaceutical Industry and Dependency in the Third World. GARY GEREFFI. Princeton University Press, Princeton, N.J., 1983. xiv, 292 pp. $25; paper, $9.95.

The persistent poverty of the less-developed countries (LDC's) has of late inspired a new explanation for underdevelopment—dependency. Mainstream social scientists in the United States have long focused on problems indigenous to the Third World as causes of underdevelopment—shortages of skilled labor, absence of entrepreneurship, inadequate pools of capital, illegitimate political institutions, local markets so small as to prevent achievement of economies of scale, and on and on. Dependency theorists reject such explanations. The central cause of underdevelopment from their perspective is none other than the developed nations themselves, especially the United States.

For dependency theorists, development and underdevelopment are "opposite sides of the same coin," namely the world capitalist system. Underdevelopment results when nations are integrated into this system on artificially asymmetrical terms. This asymmetry is imposed by the political and economic power of developed nations (the "center") and maintained in conspiracy with transnational corporations (TNC's) and local political elites. Underdevelopment is self-perpetuating unless LDC's (the "periphery") break away from the world capitalist system, thereby achieving "autonomy." Dependency theorists thus continue the twin socialist traditions of focusing on the distribution of given wealth rather than on the creation of wealth itself and of regarding markets as facades for exploitation rather than as mechanisms for efficient allocation of scarce resources.

As an attempted demonstration of the predictive power of dependency theory, Gary Gereffi has conducted a fascinating analysis of a startling and almost unique phenomenon—LDC (in this case Mexican) dominance of a high-technology industry. Steroid hormones are an especially important class of pharmaceuticals, including the corticoids (such as cortisone) and the sex hormones (such as birth control pills). In 1955, more than 80 percent of the world supply of steroid hormones came from Mexico, a Mexican firm (Syntex) was foremost in the world industry in terms of technology, and the domestic Mexican industry was almost exclusively locally owned. Gereffi argues that this singular instance of LDC preeminence provides a "least-likely crucial-case" test for dependency theory. In plain English, the argument is that the mid-1950's Mexican steroid hormone industry was an extremely improbable candidate for dependent status vis-à-vis the developed nations; if "dependency" emerges even under these propitious circumstances, then exploitation must be regarded as the norm of world capitalism and direct LDC government intervention toward disengagement from the center becomes the only viable strategy for peripheral development.

Turning Gereffi's jargon on himself, it can be argued that the book under review provides a "most-likely crucial-case" test for dependency theory. The text is excellently written; the material is fascinating and extremely salient; and Gereffi himself is an obviously humane and competent scholar whose common sense and commitment to truth far outweigh any ideological objectives. If a