

Fermilab's siting: nothing but a "landgrab"?

Poliscide

T. J. Lowi, B. Ginsberg et al.
306 pp. Macmillan, New York, 1976. \$5.95

Reviewed by Anton Jachim

In 1967 the Atomic Energy Commission, with the help of the National Academy of Sciences, decided that its new accelerator laboratory would be built at a site in Illinois. The controversial Fermilab now stands on that site near Batavia, 30 miles west of Chicago. Eleven researchers, then fortuitously located at the University of Chicago, took the trouble to undertake a complex study or, as the principal authors (political scientists Theodore Lowi and Benjamin Ginsberg) term it, a "cluster of case studies" of the social and political decision-making at work that led to placing this project on the public agenda and eventually to the selection of this site for the new accelerator. They present their work and that of the other nine researchers and co-authors, based on documentary evidence, interviews and questionnaires, in *Poliscide*.

Lowi and Ginsberg look at two sets of concerns through the prism of this multi-faceted public-works case: federal science policy and the structure of American federalism. They take both of these to be social problems given the fragmentation and yet interdependency of elements in modern society. The burden of the book is on the latter problem and I, for one, am glad that this is so, because this aspect of the case has not been previously developed. Some will remain skeptical about the evaluations the authors made of the strategies and tactics of those who wanted the accelerator built or wanted it built in a particular place. Some will doubt the gravity attached to the impact of the project on the socio-cultural environment of its site; they will wonder if perhaps it is unrealistic to expect governments to be as socially responsible in their decision-making as the authors would like them to be. But these people will certainly be made aware of completely new perspectives on the set of events that make up this case.

The authors' position and assumptions are set forth in the introduction. An elaborate table displays the various actors in the case, running from the Atomic



The Village of Weston was part of the 6800 acres given to the AEC in 1969 by the State of Illinois as a site for the Fermi National Accelerator Laboratory. The houses in the Village served as temporary administrative offices for the Laboratory during the construction period. The houses now serve as residences to accommodate visiting experimenters. The group of houses around the horseshoe at lower center are former farm homes moved here from other parts of the site. They are now being converted into residences for visitors. (Photograph: Fermilab)

Energy Commission to the small Village of Weston, which stood on the current site and was later in effect abolished by the state of Illinois. What is more, the table shows the varied perspectives of the actors as determined by their definitions of job or organizational responsibility and as causally related to the policies each pursued. This provides the necessary backdrop for the theme that sets the tone for the book: "Power corrupts; specialization of power, zealously applied along specialized lines, corrupts absolutely." The authors note that the conduct of all actors in the case was proper and sufficient *in their own terms*, but with no one of them striving to achieve the general public interest the result was a debacle in terms of governance, that is, "poliscide." They

believe that this is not the way to make public-policy decisions.

Part I deals with such issues in American federal science policy as the scientific community's ties to governmental patrons, intradisciplinary funding squabbles and the regional distribution of scientific resources, and "brain drain" conflicts of the 1960's. The climax of this part of the story comes in 1964 when the Midwest Universities Research Association was denied funds for an accelerator it wanted to build near Madison, Wisconsin and clearly "... scientific decision-making would never be quite the same again." This is rightly shown to precipitate the siting decision for Fermilab. Lowi and Ginsberg trace the genesis of the Village of Weston along with its demise, after a

frantic national site competition, when it met the federal government and its accelerator on the prairies of Illinois. The scientists wanted this accelerator in a reasonably convenient place and the state and local county governments, organized interest groups and later the federal government wanted it in Illinois, even if the project would not necessarily further other national goals, such as the advancement of civil rights in terms of open occupancy, desegregation and job opportunities for black people in the Chicago metropolitan area.

In part II the working-class/sometime farmer culture and the emerging middle-class culture of the accelerator site area, as well as the impact that the accelerator had on the people involved, are examined. If the AEC and the scientists are the villains of part I, DuPage County and the Illinois Department of Business and Economic Development are the heavies in this section of the book. The newly formed DBED seemed determined to show the federal government, and incidentally everyone else, how effective it could be even at the expense of a few villagers and farmers. In an attempt to show this over-zealousness the authors get bogged down in the politics of land acquisition and the idiosyncrasies of DuPage County beyond what is necessary to make their point. Lowi and Ginsberg deem the taking of the citizens' land and buildings and the destruction of the web of social relationships at the site to be nothing less than "conquest." But one still wonders, even given the evidence, how many of those affected were indifferent to it all. Moreover, others might attribute the aggressiveness of the DBED to the peculiar nature of the tournament-like competition in this case and thus the need for speedy action on the part of the contenders, rather than to some general property of government officials or their departments.

Lowi and Ginsberg conclude that from the standpoint of good government the accelerator project was a failure. They take this critical stance not only because of the results of what appeared to them to be an intentional policy of ignorance about the impact of the accelerator on its environment and ignorance of the policy perspectives and motives of other actors by any one actor (for example, the federal government remained ignorant of the DuPage County Government's original plans for the site area), but also because scientists were unable to show how the project met some set of stated overall national policy objectives. The authors are greatly disillusioned by the scientists, who value knowledge highly but chose in this case to be ignorant, and they conclude that the scientific community constitutes just another special-interest group and thus a potential social problem.

All actors and levels of government are seen as culpable, but the federal govern-

ment is singled out for blame because it funded the project without producing guidelines or standards of behavior that, if observed, would lead to fulfilling national objectives. Lowi and Ginsberg prescribe that any further science (or other) public works projects require "... a recognition of the variations in goals and perspectives among the intervening levels of government, and makes absolutely necessary some kind of continuous central planning (pre-audit) and a never-ending supervisory process (post-audit)." We all know that it is exceedingly difficult to operationalize prescriptions like these, but one is encouraged that it can be accomplished by a national government for a large, one-of-a-kind, technological project if it has the will to do so, such as the recent inquiry on the Mackenzie Valley Pipeline in Canada demonstrates. (See D. J. Gamble, *Science*, 199, 946 (1978). The proposed pipeline would run through more than one subnational jurisdiction so the analogy is imperfect.)

As a work of social science there are problems with this book. The authors often confuse and contradict what is known about what social scientists have come to call "artificial" and "natural" systems. These are seldom, if ever, congruent. The book does not disclose newly discovered regularities to speak of in the political process, but illuminates some that are already known. It does reacquaint the reader in a detailed and scholarly way with the painful fact that political processes in the United States—allowed a free rein in this case by the scientific community once the commitment to build the accelerator *somewhere* had been made—are often inadequate for the high standards we set for government. This is especially so in the decision-making arena of public works, where log-rolling, inconsistencies in standards, and budget irresponsibility are often a way of life.

Scientists and others will find many things to disagree with in this book. But it will tweak a thoughtful reader's moral sensibilities. This book should be read by students in courses on "science and society." Persons who have been or are now involved in any way with the accelerator at Batavia should read it. Researchers, research administrators, science writers, policy analysts, politicians and government officials should read it. Reflecting on this case I wonder if they would then resolve that scientific-political decision-making will "... never quite be the same again?"

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The Chemical Physics of Surfaces

S. R. Morrison

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The science of solid surfaces is concerned with problems ranging from the basic physics of perfect crystal faces to the complicated chemistry of industrial catalysts. The field has grown rapidly over the last ten to fifteen years, attracting scientists from traditional areas such as solid-state physics, physical chemistry and metallurgy; special experimental techniques have been developed and a variety of theoretical models are being explored. An interdisciplinary approach to the subject is almost a necessity because a reasonably complete understanding of a particular surface phenomenon may require information regarding the electronic structure and crystallography of the surface together with result for diffusion rates, chemical bonding and reaction kinetics. The synthesis of these elements must be done in spite of difficulties in the exchange of data and ideas between the different areas.

Roy Morrison, the author of *The Chemical Physics of Surfaces*, is fully aware of this situation. He has been active in surface research for many years and is particularly well known for his work on the electrochemistry of semiconductor surfaces. In the preface Morrison writes that in preparing the book he had in mind "the mature surface chemist who wants to become more familiar with recent developments in surface physics, and the mature surface physicist who wants to become more familiar with the chemistry occurring on his sample surfaces." The writing probably favors the chemists, but both groups should find this an interesting and useful book.

After introducing some of the important concepts specific to surfaces (such as surface states, surface sites, chemisorption and space charge), Morrison devotes chapters to experimental methods, clean surfaces, surfaces with adsorbates and additives of various types, the solid-liquid interface, photoeffects and heterogeneous catalysis. He emphasizes semiconductor surfaces throughout, but not to the exclusion of metals and insulators, and in less than 400 pages he succeeds in giving an overview of these topics. He does it by keeping the discussion qualitative, often in the form of short synopses of representative studies, and by including only a minimum of details about experimental and computational procedures.

For example, one finds brief discussions of a number of surface systems that have been characterized by Auger electron spectroscopy, low-energy electron diffraction, photoelectron spectroscopy and related methods. However, the book does not attempt a thorough treatment of