

*Sociopolitical Aspects of Canal Irrigation in the Valley of Oaxaca.* SUSAN H. LEES. *Memoirs of the Museum of Anthropology, University of Michigan*, Number 6, Ann Arbor, 1973, xi + 143 pp., illus. \$6.00.

What impact does irrigation technology have on society? Almost 40 years ago, Wittfogel pronounced that technological problems unique to controlling irrigation water led to a Despotic State. Since then, some of anthropology's best have contributed more research and debate to this issue than to any other hypothesized relation between technology and society. The host of discussants includes Adams, Armillas, Bennett, Geertz, Haury, the Hunts, Millon, Moseley, Neeley, Netting, Palerm, Price, Sanders, Spooner, Vivian, and many more. Such a distinguished cast forewarns the seriousness of the issues. Stripped of subtleties, at issue is a test of cultural materialism itself. For if it cannot be established, after all the research effort expended on this topic, that there are discernible boundaries to the interrelations between techno-environmental variables and social organization, then the strictly cultural materialist explanation of cultural change has suffered substantial damage to its theoretical foundation.

Wittfogel's initial proposition has stimulated work in archaeology and ethnography. Archaeologists have

been concerned with the spatial and temporal correspondence of the emergence of the state and the development of canal irrigation. Some have suggested that bureaucratic requirements of the development of canal irrigation fostered the emergence of political centralization and, subsequently, social stratification. Cultural anthropologists have been synchronic, searching for linkages between irrigation technology and the organizational structures and processes necessary to operate that technology, and they have expanded this inquiry in order to understand the linkages between hydraulic organizations and other sociopolitical structures not directly concerned with water management. The former class of linkages was relatively easy to establish, but the latter has proved fraught with difficulties. In any case, establishment of the derivative, sociopolitical effects of water management would provide powerful support for a cultural materialist's model of cultural change.

As these theoretical considerations crystallized into testable hypotheses, it became apparent that an empirical resolution of these problems required more information. Subsequently, several well-known archaeological projects have been accumulating data and skeptically reformulating some of the more highly visible aspects of the issues (the Oaxaca, Chan Chan, Teotihuacan, Diyala and Uruk, Valley of Mexico, and Snaketown Projects). To a lesser extent, ethnographic discussions have also moved from speculation to a more cautious, case study approach. Recent examples of both types of studies may be seen in McGuire Gibson and Theodore Downing's *Irrigation's Impact on Society* (University of Arizona Press, 1974).

Lees' research on canal irrigation had the potential of being a major contribution to this accumulating evidence and debate. Lees was fortunate to be an ethnographer in the Oaxaca Pre-history and Human Ecology Project. This interdisciplinary project, captained by Kent Flannery, has transformed our image of Mesoamerican prehistory even before its final reports have been published. Lees was also fortunate to work in an area, the Valley of Oaxaca, which is a natural laboratory for testing irrigation related questions. Its hundreds of small Zapotec-peasant communities practice several types of irrigation. With few exceptions, each community constructs, maintains, and allocates its own water, creating an ideal ethnographic situation for controlled comparisons. Moreover, Oaxaca is one of the half dozen areas in the world known to have had a "Pristine State." Sometime in the Late Formative, a remarkable cluster of events occurred. Settlements increased in size and number, expanding out of the alluvia and up along the numerous tributary streams which transect the valley floor. A more stratified, state level organization began to dominate the Valley and canal irrigation was developed. Are these events haphazardly or causally related? In this ideal setting, Lees interviewed officials in 20 canal irrigating villages, focussing on an in-depth investigation of three, and personally participated in several archaeological excavations. The results of her work on these rich data and opportunities for multidisciplinary research are presented in her book, *Sociopolitical Aspects of Canal Irrigation in the Valley of Oaxaca*. The "aspects" are presented in five loosely

related essays which will be conveniently taken up in turn.

In the first essay, Lees turns to her survey of 20 Oaxacan communities for answers to these questions: Will communities with similar water sources or irrigation technologies display similar solutions to problems of water management? Will similar water management arrangement have any notable effects on non-water related social or political organization? Although she has adequate data to perform a controlled comparison, she opts for a general description of village community organization and problems of water control. She argues that a general theme of equality and the sharing of community obligations pervades village community organization. Moreover, villages have been, until recently, relatively autonomous, controlling their internal affairs. These arguments are general, made without reference to specific communities. The methodology is reminiscent of an earlier period in American ethnography when pan-cultural generalizations were supported by reference to a few illustrative examples. How is one to determine the veracity of the generalizations? Likewise, the treatment of water control problems and solutions suffers from the same lack of a systematically stated comparative methodology. She argues that the construction and maintenance of irrigation has no discernible, systematic influence on the organizational need to manage canal irrigation. Therefore, it follows that community management of canal irrigation can have little effect on any other sociopolitical structures. She feels that the general themes of equality and community organization dominate the organization of irrigation tasks. If true, Lees' argument would have serious negative implications to those espousing cultural materialism. Unfortunately, the three tables of ethnographic evidence seem neither to support nor refute the argument. Modern ethnographic comparisons demand at least some systematic comparative or statistical proof of generalizations. Lees' conclusion that "variations in population size, type of water resources, type of irrigation device (except for large government dams), or even village status . . . do not seem to affect the nature of the office in charge of water control" (p. 40) is unsupported, although it might be correct.

Having shown herself firmly on the side of those who discount the powerful causal effects of water management on a regional level, Lees then attempts to negate any relationship between water control and political organization at the intra-village level in the next essay. To discover if the control of water has any derivative consequences on political organization, she searches the ethnographic evidence on three canal irrigating villages for answers to the following questions: Do upstream irrigators have any political power over downstream irrigators? No. People hold rights to noncontiguous parcels of land which may be upstream and downstream. Can political officials manipulate the allocation system in their favor? No. Since the offices are held on a rotating basis with no re-election, it is impossible for an official to manipulate the allocation system in his favor or for any length of time. Wealth and political power accrue to those who are older and have more land, not to those with access to the

management of the water system. Thus, her conclusions are perfectly consistent with the first essay. Canal irrigation itself has little, if any, effect upon community political organization (p. 81). Once again, this conclusion may be correct, but the manner in which the problem has been stated militates against any final evaluation. One conceptual problem concerns Lees' decision to use office holding in the civil-religious hierarchy as an indicator of political power. This is too narrow a definition of the concept. John Corbett, Eva Hunt, and others have established that sustained political power may be in the hands of Oaxacan villagers who seldom hold a formal political office such as local level PRI committees and caciques. Lees' decision to use only data on the formal political structure as an indicator of political power weakens the conclusion, since the question remains whether wealthy individuals may manipulate the water control system to their political and economic advantage without formally holding an elected office. Eva and Robert Hunt have shown such manipulation is possible in the Cuicatec region of Oaxaca, but Lees does not test the real issue as to whether differential control of irrigation water influences the local, informal system of power distribution. If I am interpreting Lees' information correctly, it appears that gaining political power depends more on access to land than water. Access to land is determined by the systems of marriage and inheritance. If this is the case, water control may be a force that sustains power and wealth inequalities that are ultimately a consequence of inheritance processes. We just don't know.

At this point, Lees strays into the materialist camp and (reversing her field) argues that local political organization can be affected by decisions regarding water control not made at the local level. In the next essay, it is claimed that the state may gain access to the village's political system by introducing an irrigation technology which is so complex or so expensive that the village alone could not build or support it. As in the earlier essays, critical evidence to support the argument seems wanting. Although she shows that the intervention of state agencies in village water projects leads to a loss of village autonomy in decisions affecting the allocation of water, she fails to provide a single example of how this loss of autonomy in *water control* leads to a subsequent loss of a village's political autonomy in other *non-water related* social and economic spheres. Moreover, it appears that there are several other potential resources, other than irrigation water, which Mexico is using to reduce the political autonomy of Oaxacan villages. These alternative resources include potable water, electricity, federal schools, and roads. In may be that strategic control of another resource results in the same sociopolitical ends that are hypothesized for irrigation water. The argument might be that the state emerges when a centralized authority is able to penetrate the system of local control of a region by effectively controlling (or mediating among) a variety of resources, one of which *may* be irrigation water. The list of alternative resources includes salt, military weaponry, potable water, transport routes, and social mobility into higher strata. Rather than toss out the materialist baby with the anti-Wittfogelian bath, we

should be more concerned that a materialist explanation of cultural change receives a fair test. Otherwise, the reaction of Wittfogel may twist many, like Lees, into awkward theoretical positions. The archaeological implications of this emerging modification of the pro-Wittfogelian position, if it can still safely be called that, remain to be worked out.

In the fourth essay, Lees refrains from any conclusions, content to organize current knowledge and speculations concerning diachronic aspects of Oaxaca water control. There is a good reason for her caution. If she had attempted to apply the theoretical position of the preceding essays to interpreting Oaxacan prehistory, she would have had to argue that since the organization of *contemporary* water management is a consequence of the extra-community sociopolitical structure, then the past organization of water control is a consequence of past supracommunity administrative organization. Such a conclusion does little to help archaeologists who have less information on prehistoric sociopolitical structures than they have on irrigation systems.

The fifth and final essay compares aspects of irrigation in other societies. Six topics are singled out for comparison: social change, variation according to resource type, cooperative labor, water distribution, disputes, and village-state relations. Cross-cultural generalization after cross-cultural generalization abound in this short chapter. For example, the topic of water distribution is narrowed to a discussion of how six societies handle what Lees considers an intrinsic conflict situation between upstream and downstream irrigators. She looks at two tribes, two chiefdoms, and two agrarian societies and discovers variations in water distribution within each of these three levels, that is, each pair shows differences at each level. She facetiously concludes that "at similar levels of complexity, different solutions to the problem of water distribution are found" (p. 116). Naturally, this conclusion supports the arguments from the earlier chapters, but what type of a comparative methodology stands behind these and other generalizations in this essay?

Concluding the five essays, Lees stresses the not inconsiderable implications of the book's argument. "If certain characteristics in the nature of water as an agricultural resource neither require nor produce specific regular social responses in and of themselves, should we disregard these characteristics entirely when we consider the role of water resources in social organization and cultural evolution? Is the latitude for variation so great that we can discover no relationship between the nature of the resource and social response?" Then, in an amazing two-step, "Although the discussion of the past few pages may seem to have indicated that this is true, we have reason to suspect that it is not" (p. 129). By "the past few pages," she is referring to 97 percent of the book. In the last four and one-half pages, she attempts to regain her credentials as a cultural materialist by arguing that irrigation permits an increase in the "effectiveness of production." Unfortunately, the argument never defines what "effectiveness" means.

Although it would take another book to clarify the confusing perspectives on Oaxacan irrigation emerging

from this book, let me bring up a few points to ponder for blithe critics who denigrate or wholly deny the effects of irrigation and resource control on social organization. Yes, Oaxacan irrigation practices do exhibit considerable variation, but we still don't know if this variation is patterned or random as the book contends. Yes, the data on prehistoric Oaxacan water control and social organization is painfully inadequate, despite the heroic efforts of several dozen archaeologists and historians, but we still may anticipate an unravelling of the story. We do know that state supra-structure has undergone considerable changes in the past two thousand years, not the least of which was the subordination of the region under a colonial structure following conquest. Subsequently, the Oaxaca Valley has witnessed the growth and decline of cochinitl and castor bean export industry, depopulation and repopulation, the development and decline of a small hacienda system, chaos and revolution, and

economic development and stagnation. Are we to assume, based on the argument of these essays, that we need no longer search the diachronic record of these basic techno-environmental and economic changes for indications of subsequent changes in sociopolitical organization? I think the answer is not as nihilistic as Lees claims. If she has contributed some cogent and appreciated arguments against the facile hypotheses associating the control of irrigation with political authority and the rise of the state, she has also masked the real nature of pertinent socio-materialist questions. More archaeological and ethnographic evidence, more careful analyses of data, and more refined conceptual distinctions are needed in the next book in this continuing debate.

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