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* European Office: 22 Mulberry Walk, London, S.W. 3, England (Telephone: 352-9749)

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The Use of Arid Lands

The approximately 14 percent of the world's cropped lands that are under irrigation produce a fourth or more of the world's agricultural crops. As the food needs of a too rapidly growing population continue to increase, more and more of the arid and semiarid regions will be cultivated, for much of this land is capable of year-round use, and conditions are more favorable than in humid regions for the control of insects and disease and the advantageous timing of water application. One estimate is that by the year 2000 there will be twice the present 370 million acres under irrigation, even though the cost of new irrigation projects, which now averages almost \$400 per acre, is substantially higher than the cost of bringing new land in humid regions under cultivation.

The investment required means that irrigation agriculture can be economically successful only when combined with sophisticated farm technology. Yet too often, over the world, expensive water storage and distribution facilities have been uneconomically coupled with moderately primitive methods of farm operation.

These were some of the points made at the International Conference on Arid Lands in a Changing World which AAAS held in Tucson, Arizona, on 3 to 13 June. This was the second international arid lands conference held by the Association, and there were some significant differences between this one and the one held in 1955.

The participants, who came from every major arid area of the world, had a variety of technological advances to discuss—for example, remote sensing systems, desalting methods, and the new high-yield grains. Yet more significant than these developments was the greater attention paid to economic, to sociological, and especially to the management aspects of the complex problem of using a fragile environment continuously without destroying it. There were a few examples of long-enduring irrigation successes. But they were more than counterbalanced by reminders of how extensively man has unwittingly turned grassland and food-producing areas into wasteland and desert. The Sahara, for example, is still increasing by 40,000 acres a year.

A frequently expressed theme was the fact that agricultural improvement alone can do but little for the economic advance of many arid countries. One speaker estimated that a doubling by 1980 of the agricultural output of Iraq, without any increase in input—an implausible assumption—would raise per capita income from \$190 to \$220 a year. It was also reported that the economic effect of the High Aswan Dam and other projects in Egypt might be to increase per capita income from about \$130 to about \$142 a year, and that the irrigation canals were also responsible for a grave increase in schistosomiasis.

Other means than traditional agriculture with emphasis on grains and staples will be necessary if substantial increases in per capita income are to be achieved. Specialty products, industrial or other nonagricultural developments, and—as many speakers mentioned—increased tourism will be needed if most of the arid regions are ever to reach the stage of self-generating economic growth.

But traditional agriculture is the base from which these regions must start, and thus the need for wise land management was reemphasized. The arid lands experts were uncertain whether the pressure to exploit more of the arid lands would, quite literally, in the long run make the deserts bloom or produce more Saharas. In a larger sense they were illustrating, from the consequences of several millennia of irrigational history, that trying to control the environment is hazardous and insufficient. Man must also adapt to it.—DAEL WOLFLE