drawn implications for the present; analytically, rather than descriptively, conceptualized market-organizational relations within the higher education sector; and avoided invoking the "public" as an unsubstantiated causal factor in explaining change (as on p. 215). Nevertheless, Levine has written a fine book, one that will and should be read by those interested in the past *and future* of American higher education.

DAVID KAREN
Department of Sociology,
Bryn Mawr College,
Bryn Mawr, PA 19010

Educational Deficiencies

Low Tech Education in a High Tech World. Corporations and Classrooms in the New Information Society. ELIZABETH L. USEEM. Free Press (Macmillan), New York, and Collier Macmillan, London, 1986. x, 278 pp., illus. $19.95; to AAAS members if ordered from AAAS, $15.95. AAAS Issues in Science and Technology Series.

The decade of the '80s has been characterized by a morality play in which the United States is threatened by the evils of international competition in the age of high technology. The only weapon to assure survival is something called education. But our competitors have also discovered this weapon and have learned to develop and exploit it far better than we have. While our children have been preparing for economic battle for six hours a day and 180 days a year, theirs have been training for seven and more hours a day and 220 days a year. And allegedly the quality of their training for economic combat has been much higher than ours.

In the last few years a plethora of commissions have urged us to mobilize for long-term economic warfare through school reforms that will raise standards, improve teaching, and increase scientific and technological competencies. States and local school districts have responded to the task with patriotic zeal. New laws have been passed, school budgets have been raised, and many recommended changes are taking place.

Elizabeth Useem has chosen to explore the mobilization efforts by examining how well the schools and universities are doing in preparing for present and future skirmishes on the high-technology battlefields of the world. Although she has engaged in a general exploration, she has focused especially on education in the two high-technology meccas of the nation, Silicon Valley (Santa Clara County, California) and Route 128 (Boston metropolitan area). Just as these two areas have provided our most advanced technologies for the international competition, perhaps they have built the educational framework for maintaining that lead.

Through interviews with industry leaders, educators, engineers, and government policy-makers as well as reviews of school curricula, funding, and performance, Useem collected data on efforts to improve education for the high-tech challenge. She also evaluated progress toward forging partnerships between education and industry to raise educational performance and to make it pertinent to technology. Finally, she reviewed the response of higher education to the economic problems that confront the nation.

As the title of the book suggests, Useem comes away unimpressed with the educational response. At all levels she finds little encouragement.

At the public school level, the shortage of qualified mathematics and science teachers (and newly trained competent teachers of all subjects), the outdated science curricula, and inadequate budgets and supplies and equipment are hindering the development of first-class educational programs. Attempts to upgrade these programs are focusing primarily on the secondary schools, ignoring the general lack of science education in the elementary schools.

Though she is heartened by the increase in required high school courses in mathematics and the sciences, she concludes that these efforts are underfunded and will result in the assignment of many underqualified teachers to meet the demands of additional courses. Even higher education is characterized by shortages of faculty and needed equipment for teaching technical and scientific subjects.

Nor is it clear that help from industry or future progress will solve the problems. At best, Useem asserts, business and industry can increase awareness of employment needs and educational priorities among educators, students, and parents and can provide a powerful constituency favoring more educational funding. In large measure, this can be done out of self-interest, since business and industry have much to gain from both outcomes.

The book is the best available representation of the present focus on improving the schools to make the economy more efficient. It also provides an accurate and detailed picture of the dynamics of recent school reforms that were designed to recapture the U.S. economic role in world trade. Useem's descriptions and analyses paint a troublesome picture of American education at a time when many are depending heavily upon the schools to maintain economic competitiveness and respond to the promise of high technology.

But, in the opinion of this reviewer, the work fails to raise the most important challenge facing the educational system with respect to occupational preparedness. It accepts too readily the aphorisms of "high tech" and the "information age" in asserting that the labor market will require workers with higher levels of technical skills. Technologically oriented jobs that require two years of college or more account for only about 5 percent of all jobs in the U.S. economy at present, with projections to 6 percent by 1995. Most employment growth has been and will continue to be found in low-level service jobs such as custodian, clerical worker, fast food worker, nurse's aide and orderly, and retail clerk. These jobs are characterized by relatively low wages and low educational requirements. Further, case studies in which microprocessor technologies have been applied to traditional occupations have shown strong evidence of reduced skill requirements for those jobs. The power of microprocessors has lessened the need for analytical and technical skills among large categories of workers in printing, mechanics, computer programming, financial analysis, electronic machine repair, and a host of other occupations, and this may be just the beginning.

It is difficult to find any evidence that the laggardness of our manufacturing sector and our massive foreign trade deficit are due to a problematic labor force. Rather, there is considerable evidence that among domestic policies it has been poor management decisions, inadequate sensitivity and orientation to foreign markets, an overvalued dollar, and U.S. multinational investment in low-wage economies that account for the decline in our economic position relative to other nations.

If there is a major threat to the American economy that can be attributed to an educational system that needs overhauling, it has to do with the increasing number of disadvantaged youngsters entering the schools. Such students make up 30 percent of the enrollments in U.S. schools at present and will account for half in 20 years. Owing to poverty, non-English-language backgrounds, and cultural differences, they do not benefit substantially from their schooling. Many of them leave schools without the skills to work productively, even in low-level service positions that require at least some skill in reading, writing, computation, and elementary reasoning. This may be a less romantic challenge for the schools than that of the "information age," but it will have far more important economic and social consequences.

H. M. LEVIN
School of Education,
Stanford University,
Stanford, CA 94305-2384