

other lands be set aside to compensate for this loss of diversity in the heavily managed lands. Only by setting land aside in this way can anything like the full range of species and ecosystems be perpetuated for future generations, in the face of increased use for the fulfillment of human needs.

Finally, research on island biogeography has shown that species diversity is directly correlated with island size. Since land preserves are analogous to islands, this provides an argument that larger preserves are preferable to smaller ones.

Conclusions

The conflict between conservationists and preservationists is not a purely scientific one—public policy debates never are. It cannot be resolved by empirical means alone. If, however, we begin with the assumption that our society is committed to the goal of protecting biological diversity for the benefit of future

generations of Americans, there seems to be scientific evidence that only a preservationist approach can succeed. It is an important point in the preservationists' favor that the full range of data is better comprehended using their concept of predictability than the conservationists' favored indicator of resilience. The dynamic features of fragile ecosystems cannot be protected by management initiatives designed to maintain a static concept of stability. The preservationist approach deserves serious attention as we continue our national debate over the use of our remaining unspoiled lands.

This article is drawn from "Conservation, Preservation, and Controversies About the Use of Public Lands," a talk given by Bryan G. Norton, Research Associate at the Center for Philosophy and Public Policy, at the May Third Thursday Briefing, sponsored by the Center for Philosophy and Public Policy. Third Thursday Briefings, held on Capitol Hill from February to June, bring together academic theorists and policymakers to discuss the ethical or conceptual foundations of central policy decisions.

Brave New Office

A century ago the typewriter revolutionized American offices—and in the process transformed clerical work from a high-status male profession to a low-status female job. The gentleman's secretary became "just a secretary," with pay and career opportunities curtailed accordingly. Today the computer promises to bring far more sweeping changes, as the explosion in microprocessing begins to reverberate in the typing pool. Already the word processor has replaced 10 percent of the typewriters in the nation's 500 largest industrial companies, and with the cost of labor rising and the price of electronics dropping, few doubt that the automated, computerized, electronic "office of the future" is on its way.

A first fear is that office automation will boost clerical unemployment; optimists counter that the computer will create new jobs as it destroys old ones. But what will these jobs be like? How will they affect the workers—predominantly women and predominantly un-unionized—who have to do them? The "office of the future" raises important and troubling questions about the rights of workers and the nature and meaning of work.

Computers: Hazardous to Your Health

One danger of the electronic office lies in the deleterious health effects on the now more than 10 million workers who stare at video display terminals (VDTs) during their working day. A 1979-80 study by the National Institute of Occupational Safety and Health found high levels of both physical and mental stress among terminal operators, ranging from back-

aches, headaches, and eyestrain to depression and fatigue. Operators report that work on the terminals, however more efficient, is far more exhausting than work on old-fashioned typewriters.

The Occupational Safety and Health Act of 1970 takes as its stated purpose "to assure so far as possible every working man and woman in the nation safe and healthful working conditions." The right to a safe and healthful workplace is already guaranteed by law (although enforcement is lax and spotty), so office workers whose health is jeopardized by the stampede to computerization should face no new legal or moral battles.

Computer-age health problems seem amenable to commonsense remedies. Terminals can be redesigned to reduce glare and to achieve better contrast between text and screen; detachable keyboards and adjustable tables and chairs considerably improve worker comfort. These simple and relatively inexpensive design features have not been widely adopted, however. A more direct and effective solution is to limit the hours workers spend in front of the terminal. In Norway and Sweden, for example, workers cannot be required to do steady VDT work for more than four hours a day, scheduled in a two-hours-on/two-hours-off rotation. Even in this country, Newspaper Guild contracts negotiated for four newspapers in Minneapolis and St. Paul grant terminal operators extra rest breaks of up to 30 minutes a day.

These health problems are exacerbated, however, by other deeper problems posed by office automation. Computers can be used to increase the pace and

pressure of office work and to routinize and regiment it, in ways that take their toll on workers' health, as well as their humanity.

The Computer as Boss

Two features of computers give rise to particularly disturbing problems for those who must work with them. The first is the tendency of computer automation to lead to fragmentation in the labor process. According to Joan M. Greenbaum, author of *In the Name of Efficiency: Management Theory and Shopfloor Practice in Data-Processing Work*, "Computerization of a process requires that the steps in that process be defined in extreme detail so that computer programs can be written that will imitate the actions of the workers." Tasks must be broken down into their smallest discrete components, "rationalized" into their simplest basic steps. It is an easy transition from fragmenting the work process in this way to distributing the fragments among different workers, so that each worker completes only an isolated part of the full operation. Thus the secretary's job is broken down into separate, specialized tasks—inputting manuscripts, editing manuscripts, retrieving information from the computer's memory bank, filing—which may be parceled out to clerical workers who originally handled a wide variety of functions.

Computers have as well a remarkable capacity for minutely monitoring the pace and flow of work. Every stroke of the typist's fingers can be tallied—including every time she needs to strike the correction key. Pauses can be electronically recorded for a supervisor's easy review. While such unflagging surveillance permits a highly accurate measure of one sort of productivity, it leaves no scope for worker privacy and drives workers to meet ever higher machine-set quotas.

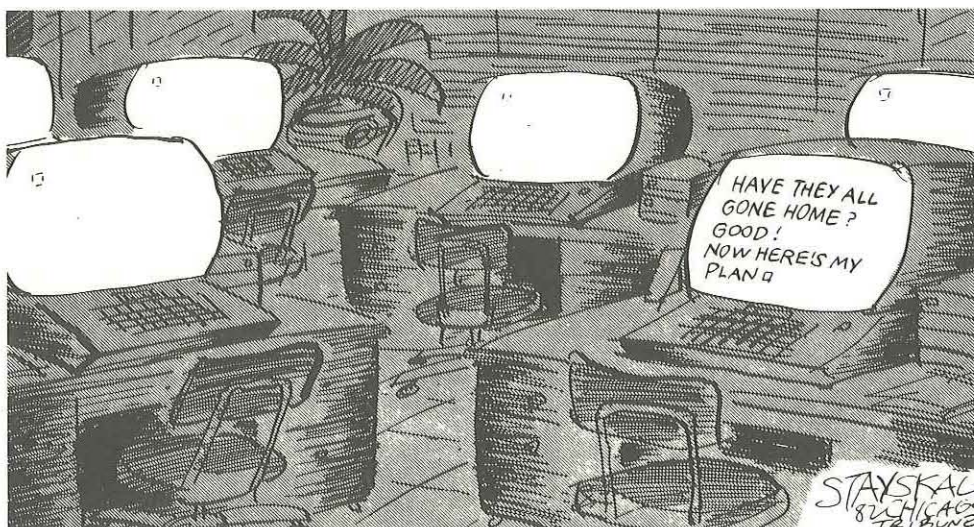
Computer fragmentation of work and computer monitoring of work reinforce each other. The worker's task must be defined as narrowly as possible in order

for the computer—and the human manager—to keep clear tabs on its progress. Greenbaum argues that fragmentation of work is designed as much to extend management control over work as to enhance efficiency. Conversely, when workers are evaluated only on the performance of certain carefully defined functions, this reinforces a single-minded focus on those functions, thus completing the fragmentation. If the number of keystrokes is all that matters to management, why should a secretary stop to correct spelling or to query an inconsistency?

Work and Humanity

The psychological and spiritual effects of office automation may be more serious still, for if computerization ends up substituting mechanical rigidity and regimentation for human imagination and initiative, it threatens workers' self-respect and self-esteem. The meaning of work, and the dignity of the worker, may both be degraded.

Philosopher Mary Gibson, writing in *Workers' Rights*, argues that just as workers have a right to a safe and healthful workplace, so they have a right to a useful and challenging job. In fact, the right to meaningful work is supported by the right to safe and healthful working conditions, because pointless, demeaning, and unchallenging work has itself been shown to be a health hazard. Gibson's thesis is supported by Charles Hampden-Turner's studies of the mental health of workers. Utilizing an index of "high" versus "low" mental health (where low mental health is characterized by such symptoms as depression, poor social relationships, anxiety, and hostility), Hampden-Turner found that the percentage of workers with high mental health correlated with job skill levels as follows: skilled—58%; semiskilled—35%; repetitive semiskilled—10%; repetitive machine-paced semiskilled—7%. As workers are deskilled and confined to rote, tedious jobs, their physical and mental well-being suf-



Reprinted by permission: Tribune Company Syndicate, Inc.

fers significantly. Gibson concludes: "The right to a useful and challenging job arises . . . as a necessary condition for mental and physical health and from the right to a safe and healthful job."

On Gibson's view, the right to meaningful work is supported also by a commitment to individual autonomy. Workers in repetitive, machinelike jobs have no opportunity to make decisions about even the most trivial details of how they perform their own tasks. When secretaries who once supervised a host of complex office processes now sit all day in a word processing pool inputting data at the computer's command, autonomy is radically circumscribed.

The deskilling of workers and the degradation of

The right to meaningful work is supported also by a commitment to individual autonomy. Workers in repetitive, machinelike jobs have no opportunity to make decisions about even the most trivial details of how they perform their own tasks.

work deprive workers of an important component of human good. In *A Theory of Justice*, John Rawls posits what he calls the "Aristotelian Principle": "other things equal, human beings enjoy the exercise of their realized capacities (their innate or trained abilities), and this enjoyment increases the more the capacity is realized, or the greater its complexity. The intuitive idea here is that human beings take more pleasure in doing something as they become more proficient at it, and of two activities they do equally well, they prefer the one calling on a larger repertoire of more intricate and subtle discriminations." This basic principle of motivation explains why office workers, other things equal, would prefer to program computers than to carry out programs written by others, to edit manuscripts rather than type them.

Given the apparent truth of the Aristotelian Principle, individuals should strive to develop and use their talents and abilities, and social institutions, on Rawls's view, should be designed to facilitate their doing so. Otherwise, Rawls writes, "human beings will find their culture and form of life dull and empty. Their vitality and zest will fail as their life becomes a tiresome routine." The typical level of vitality and zest of VDT operators at five o'clock bears Rawls out only too well.

Technology and Choice

Champions of office computerization insist that the computer's potential to improve office working conditions is also great. Typing was never terrifically rewarding anyway, and the computer can eliminate endless retyping and messy cut-and-paste sessions. Furthermore, since "keyboarding" is not off-limits to executives in the way that typing has been, computerization can help to minimize hierarchical distinctions

and make offices at least seem more democratic. And computers can provide a more genuine democracy as well. Knowledge is often power, and broader access to information may lead to power being more equally shared.

Which will it be? Will office computers make things better or worse? The technology itself gives us no imperatives, or at least none that we need accept if we choose not to. Greenbaum points out that computer technology is from start to finish a matter of human choice. "This type of technological change did not fall from the sky. . . . Technological innovation is nothing more or less than a process, which, like any other process, involves people from beginning to end. Technology-based products are shaped by the people who specify the design objectives and by the people who are affected by them."

Traditionally, however, they have been shaped far more by management objectives than by workers' needs. The decision to utilize certain technologies, and how to utilize them, has been almost universally a management prerogative, challenged (so far unsuccessfully) by only a handful of American unions.

Now, alarmed by the rate and sweep of workplace automation, unions have begun to fight for an active role in assessing new technology *before* it is adopted and for specific protection against the negative impact of technological change. A recent United Auto Workers bargaining package included, for example, demands for full union access to all information created by any computerized system, for company assurances that computers not be used to monitor or discipline workers, and for establishment of technology committees and "data committeemen" positions to evaluate the potential effects of projected innovations.

"This type of technological change did not fall from the sky. . . . Technological innovation is nothing more or less than a process, which, like any other process, involves people from beginning to end. Technology-based products are shaped by the people who specify the design objectives and by the people who are affected by them."

Vigilant unions provide little protection, unfortunately, to the millions of office workers who remain unorganized. Secretaries and clerical workers are by and large unable to bargain collectively to secure their rights. As the "office of the future" comes more and more to resemble the factory of the past, however, office workers may organize as factory workers did before them. This could be one result of the computer revolution least welcome to many who have heralded its coming.

—Claudia Mills

Announcing New Working Papers

The following newly released working papers can be ordered from the Center for Philosophy and Public Policy for a charge of \$2.50 per copy, for postage and handling. Discounts are offered for large quantities purchased for classroom use.

A complete bibliography of Center books, working papers, and offprints is available upon request.

The Preservation of Endangered Species (\$2.50 each; \$6.00 for the series)

- PS-1 Duties of Preservation
by Donald Regan
- PS-2 Extinction, Evolution, and Environmental Management
by Terry L. Leitzell
- PS-3 On the Inherent Danger of Undervaluing Species
by Bryan Norton

Risk and Consent (\$2.50 each; any four for \$8.00)

- RC-1 Risk and Consent: A Survey of Issues for Centralized Decision Making
by Douglas MacLean
- RC-2 To Breathe Freely: Risk, Consent, and Air
by Mary Gibson

- RC-3 The Role of Consent in Legitimizing Risky Activity
by Samuel Scheffler
- RC-4 Reform of Occupational Safety and Health Policy
by Mark MacCarthy
- RC-5 To Hell with the Turkeys! A Diatribe Directed at the Pernicious Trepidation of the Current Intellectual Debate on Risk
by Michael Thompson
- RC-6 Cost-Benefit Analysis Applied to Risks: Its Philosophy and Legitimacy
by Richard Zeckhauser and Herman B. Leonard
- RC-7 Culpable Ignorance of Interference Effects
by Ian Hacking
- RC-8 Risks of Passive Smoking
by James Repace

Liberalism: Does It Mean Anything Today? (\$2.50 each; \$4.50 for the pair)

- LI-1 Symposium: Toward a Liberal Foreign Policy
by Marshall Cohen
with a reply by Nathan Tarcov
- LI-2 Symposium: Liberalism in Retreat
by Christopher Lasch
with a reply by Michael Williams

Order Card

Quantity	Title	Price
All orders must be prepaid (checks payable to Univ. of Md. Foundation)		Subtotal
Postage and handling (books only) \$1.50		
TOTAL		

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Return this form to: Center for Philosophy and Public Policy

Room 0123 Woods Hall
University of Maryland
College Park, Maryland 20742