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Citizen Virtues in a Technological Order

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As IT PONDERS important social choices that involve the application of new technology, contemporary moral philosophy works within a vacuum. The vacuum is created, in large part, by an absence of widely shared understandings, reasons, and perspectives that might guide societies as they confront the powers offered by new machines, techniques, and large-scale technological systems. Which computer applications are desirable and which ought to be avoided? How can one weigh the risks of introducing a new chemical into the environment as compared to benefits of its use? Should there be limits placed upon the ability of biotechnology to alter the genetic structure of plant and animal life? As we ponder issues of this kind, it is not always clear which principles, policies, or forms of moral reasoning are suited to the choices at hand.

The vacuum is a social as well as intellectual one. Often there are no persons or organizations with clear authority to make the decisions that matter. In fact, there may be no clearly defined social channels in which important moral issues can be addressed at all. Typically, what happens in such cases is that, as time passes, a mixture of corporate plans, market choices, interest group activities, lawsuits, and government legislation takes shape to produce jerrybuilt policies. But given the number of points at which technologies generate significant social stress and conflict, this familiar pattern is increasingly unsatisfactory.

Philosophers sometimes rush in to fill the void, offering advice that matches their training and competence. They examine cases in which some feature of a present or emerging technology raises questions about right and wrong in individual choices and social policies. They take note of properties of the new technology that have important consequences for social life, properties that raise interesting philosophical issues; for example, issues about the rights and responsibilities of those who develop or use the technology in question. From there they can develop a variety of theories, principles, and arguments that may help people decide what to do.

Proceeding in this way, philosophers may find themselves involved in an exercise that is essentially technocratic. The complicated business of research, development, and application in modern life includes a moment where the "value issues" need to

be studied and where the contributions of knowledgeable, degree-carrying experts can be enlisted. In the United States, for example, the National Science Foundation has for many years included a program on "ethical and value studies" that supports university scholars who do research of this kind. The underlying assumption seems to be that this is an important area that the nation needs to cultivate. The sponsors may hope that officially designated "values experts" can eventually provide "solutions" to the kinds of "problems" whose features are ethical rather than solely technical. This can serve as a final tune-up for working technological models about to be rolled out the showroom door. "Everything else looks good. What are the results from the ethics lab?"

Philosophers sometimes find it tempting to play along with these expectations, gratifying to find that anyone cares about what they think, exhilarating to notice that their ideas might actually have some effect. But is it wise to don the mantle of values expert? Although philosophers may be well equipped to help fill the intellectual emptiness caused by the lack of moral understandings, ethical reasoning, and community guidelines, there remains the social and political vacuum that so often surrounds discussions about the moral dimensions of technological choice. After one has addressed the range of social theories, empirical analyses, philosophical arguments, and ethical principles about the possibilities of Technology X, there remains the embarrassing question: Who in the world are we talking to? Where is the community in which our wisdom will be welcome?

Consider the following passages from two prominent writers addressing urgent ethical questions for our time. The first is from a well-known biologist reflecting about the ethical dimensions of developments in his own field.

> Given the nature of our society, which embraces and applies any new technology, it appears that there is no means, short of unwanted catastrophe, to prevent the development of [human] genetic engineering. It will proceed. But this time, perhaps we can seek to anticipate and guide its consequences.[1]

The second passage was written by a professional philosopher, exploring avenues for the new field of computer ethics.

> We are open to invisible abuse or invisible programming of inappropriate values or invisible miscalculation. The challenge for computer ethics is to formulate policies which will help us deal with this dilemma. We must decide when to trust computers and when not to trust them.[2]

Both of these passages are notable for the way they employ the term *we* in contexts where moral issues about technology are open for discussion. But who is the "we" to whom the writers refer? Both writers seem to mean something like "people in general" or "society as a whole." Or perhaps they mean something like "those who work in a particular field of technical development and have privileged access to the decisions that matter."

I raise this point not to call attention to the way writers, including this one, loosely deploy first-person plural pronouns. What matters here is that this lovely "we" suggests the presence of a moral community that may not, in fact, exist at all, at least not in any coherent, self-conscious form. If "we" scholars find ourselves talking about a collectivity of others who are not in fact engaged in decisions, then it is time for "us" to look around and find out where "they" have gone. That is the important first task for the contemporary ethics of technology. It is time to ask: what is the identity and character of the moral communities that will make the crucial, world-altering judgments and take appropriate action as a result?

This question is, in my view, one about politics and political philosophy rather than a question for ethics considered solely as a matter of right and wrong in individual conduct. For the central issues here concern how the members of society manage their common affairs and seek the common good. Because technological things so often become central features in widely shared arrangements and conditions of life in contemporary society, there is an urgent need to think about them in a political light. Rather than continue the technocratic pattern in which philosophers advise a narrowly defined set of decision makers about ethical subtleties, today's thinkers would do better to reexamine the role of the public in matters of this kind. How can and should democratic citizenry participate in decision making about technology?

Unfortunately, the Western tradition of moral and political philosophy has little to recommend on this score, almost nothing to say about the ways in which persons in their roles as citizens might be involved in making choices about the development, deployment, and use of new technology. Most thinkers in our tradition have placed technology and politics in separate categories, defining citizen roles as completely isolated from the realities of technical practice and technical change. There have been two distinctive paths to this conclusion, one characteristic of thinkers in antiquity, another strongly advanced in modern times. But whether we are pondering ancient *techne* or today's megatechnics, any attempt to discuss technology as a topic in political and moral philosophy needs to pause long enough to appreciate how this crucial separation occurred and how it impairs our sense of possibilities.

Technology and Citizen: The Ancient View

At the beginning of Western moral and political philosophy, speculation about *techne*, the realm of the practical arts, plays a prominent but largely negative role. As Socrates, Plato, and Aristotle seek to define the nature of knowledge, the good, political society, justice, rulers and citizens, and the form of the best state, they frequently draw comparisons to *techne*, the realm of the arts and crafts, viewing it with a mixture of awe and suspicion. Foremost among their concerns is the belief that technical affairs constitute an inferior realm of objects, knowledge, and practice, one that threatens to infect all who aspire to higher things.[3] Plato goes even further, specifying why the realm of *techne* is both inferior and potentially dangerous. True knowledge, he argues,

is not that of worldly, mutable, material things, but knowledge of the realm of unchanging ideas, *eidos.*[4]

Arguing a position that was to become commonplace in antiquity and throughout much of the Middle Ages, Plato also criticizes the practical arts for their tendency to produce innovations, a source of harmful, potentially boundless change in human affairs. Political philosophy seeks to establish good order and to maintain it against the world's tendency toward chaos and decay. "Change, we shall find, is much the most dangerous thing in everything except what is bad—in all the seasons, in bodily habits, and in the characters of souls."[5] In the first century B.C. Lucretius echoes these sentiments, lamenting the destructive role of new techniques in warfare. "Tragic discord gave birth to one invention after another for the intimidation of the nations' fighting men and added daily increments to the horrors of war."[6]

Of all classical arguments calling for the separation of technology from political affairs, the most significant is Aristotle's. For unlike Plato, Aristotle explores the possibilities of a broadly based citizenship in political societies of many different kinds, perhaps even ones that resemble our own. As he defines the roles and virtues of a citizen, however, the crucial differences between technical and political life stand out.

Aristotle's view that "man is by nature a political animal" means that humans are creatures naturally suited to live in a *polis* or city-state.[7] Drawing upon studies of some one hundred and fifty city-states of his time, the *Politics* argues that the *polis* is the highest form of human organization, one that completes the development of other forms of association, the household and the village. Political life is a gathering of freemen and equals. Each person is free in the sense that there is no master to dictate one's activities. Each one is equal as well, equal in legal standing, access to public office, and right to speak in political matters. Political life concerns matters that all citizens have in common. In the public sphere one's attention moves beyond personal or family interests to seek the good of the whole community. "One citizen differs from another, but the salvation of the community is the common business of them all."[8] Citizenship, active participation in public life, fulfills man's highest potential. The *bios politicos* realizes a greater good than more primitive forms of human existence ever attain.

Having defined politics in this manner, Aristotle goes on to explore the specific roles and virtues of the citizen. He notes the traditional distinction between the rulers and the ruled and concludes that the citizen must be different from both. Citizenship in his view must include both roles within each person.[9]

> The excellence of the two is not the same, but the good citizen ought to be capable of both; he should know how to govern like a freeman, and how to obey like a freeman—these are the excellences of a citizen. And although the temperance and justice of a ruler are distinct from those of a subject, the excellence of a good man will include both. . . .

Looking at a range of existing constitutions, Aristotle concludes that a good constitution will allow the rotation of citizens in office so the "excellences" or "virtues" he recommends will become common in actual practice.

In the same passages that offer his definition of citizenship, Aristotle takes care to specify which persons are not capable of holding this role. He points to the menial duties and craft work that were handled by slaves and foreign workers in Greek city-states of the time. Physical toil and use of the practical arts bind one to the realm of material necessity, a condition incompatible with the unencumbered freedom needed for citizenship. While slaves and craftsmen are necessary for the existence of the state and while some city-states recognize them as citizens, a good society will not extend citizenship in this way, "for no man can practice excellence who is living the life of a mechanic or labourer."[10]

Aristotle goes even further, arguing that citizens should avoid learning the practical arts because that would be degrading. "Certainly the good man and the statesman and the good citizen ought not to learn the crafts of inferiors except for their own occasional use; if they habitually practice them, there will cease to be a distinction between master and slave."[11] Thus, the making of useful things and the activities of public life must forever remain separate.

While the ideas of Socrates, Plato, and Aristotle did not by themselves define the understanding of the Greeks and Romans on such matters, entirely similar notions about technology and economics were common in antiquity. The sphere of technical affairs was closely associated with slavery and menial labor and was, therefore, something that persons of the ruling classes sought to avoid. In fact wealthy Romans normally left the day-to-day handling of private economic affairs to their slaves, the origins of what we today call "management."[12] While Romans sought material wealth, it was usually gained through landed property and commercial trade, economic sources that did not require recurring technical change. Indeed, technological innovation was widely regarded with suspicion. Suetonius tells of a time when a creative soul came to the emperor Vespasian with a device for carrying heavy columns into Rome at a low cost. Although Vespasian rewarded the man for his invention, he refused to use it, exclaiming, "How will it be possible for me to feed the populace?"[13] As the historian M. I. Finley concludes in *The Ancient Economy*, "Economic growth, technical progress, increasing efficiency are not 'natural' virtues; they have not always been possibilities or even desiderata, at least not for those who controlled the means by which to try to achieve them."[14]

Technology and Citizen: The Modern View

With the renewal of political theory in the sixteenth century and since, the prospects for social and political life are gradually redefined. Concepts of power, authority, order, liberty, equality, and the state are deployed in ways that we now consider dis-

tinctly modern. The attempts of Machiavelli, More, Hobbes, Locke, Montesquieu, Bentham, and Marx to create a new understanding of politics corresponded to path-breaking work in natural sciences that produced new ways of thinking about the physical world. Strongly associated with these intellectual movements is a thoroughgoing reevaluation of the sphere of technical practice and its economic settings, a reevaluation in which the pessimism of ancient and medieval views eventually yields to an unbridled optimism. In this ferment of ideas, the traditional view of the relationship between politics and technology was overthrown and a new one imagined.

A leader in promoting respect for technical activity was Francis Bacon. In *The New Organon* Bacon surveys the state of knowledge in his time, criticizing the hold of the ancient philosophers over the minds of moderns. He argues that the supposed wisdom of the Greeks is suspect precisely because it lacks any practical, material value: "it can talk, but it cannot generate, for it is fruitful of controversies but barren of works."[15] As an alternative Bacon sets forth a new program of knowledge and practice, one based upon careful study of particular phenomena, adherence to method, inductive logic, controlled experiment, naturalistic explanation, and a specialized division of labor among scientists. The ultimate purpose of such activity, he makes clear, ought to be the conquest of nature and expansion of human powers. Natural philosophy must go beyond the quest for knowledge as an end in itself and seek fulfillment in the practical arts.

As a former politician who had fallen from power in disgrace, Bacon enthusiastically praises the superiority of the new scientific and technical pursuits in contrast to affairs of state. Comparing the contributions of history's political heroes to those who have made wonderful discoveries and inventions, Bacon concludes that the highest honors go to scientific and technical innovators, "For the benefits of discoveries may extend to the whole race of man, civil benefits only to particular places; the latter last not beyond a few ages, the former through all time."[16]

Although Bacon's expectations about the directions the arts and sciences ought to pursue were not always prescient, his promotional views won numerous followers in later generations. Explicitly taking his advice, many French philosophers of the eighteenth century took great care to stress not only the practical value of technical pursuits but their intellectual strengths as well. In his *Preliminary Discourse to the Encyclopedia of Diderot*, Jean Le Rond D'Alembert notes the widespread contempt that surrounds the mechanical arts, an outlook that even the artisans themselves seem to share. He argues that, in fact, "it is perhaps in the artisan that one must seek the most admirable evidences of the sagacity, the patience, and the resources of the mind."[17]

Closely linked to a more favorable view of the practical arts and technical innovation is a change in attitude toward commerce and material self-interest. During the Middle Ages, avarice was often identified as both a sin and a source of civil unrest. While medieval societies were often quite open in their quest for wealth, the dominant view among church, political, and intellectual elites was that such motives should be

carefully contained. A significant development in modern social and political thought was to annul this distrust and to recast ideas about wealth and commerce in an entirely favorable light. The pursuit of economic gain, some philosophers began to argue, is actually a force for moderation, helping to nurture more rational, peace-loving attitudes among both rulers and subjects. Persons with an economic stake in such trade and manufacturing were now thought to be healthy contributors to stability and justice in political society.[18] As Baron de Montesquieu argues in *The Spirit of the Laws*, "the spirit of commerce is naturally attended with that of frugality, economy, moderation, labor, prudence, tranquillity, order, and rule. So as long as this spirit subsists, the riches it produces have no bad effect."[19] Commerce, he argues, has another beneficial effect, binding nations together in a pattern of mutual need that discourages conflict.

Ideas of this sort, increasingly common in seventeenth- and eighteenth-century political theories, helped justify the modern optimism about economic self-interest and faith in the beneficence of economic growth which lie at the foundation of modern liberal thought. In the new understanding, wealth is good not only for its material benefits but also because its pursuit produces better rulers and better citizens.

The idea that self-interested economic activity is fundamental to politics is strongly expressed in the writings of John Locke. In *The Second Treatise of Government*, Locke's conception of man is that of an acquisitive creature who subdues nature and makes it his property. Men leave the "state of nature" when they come to realize that their possessions are insecure. They form a society and, as a second step, submit to the rule of a government which recognizes their rights, particularly the right of property. From this point of view, the function of political society and government is that of defending the holdings of what are in essence private individuals. If it turns out that government is not useful in achieving these purposes, it can be rightfully overturned in revolution.

At the center of Locke's theory of political society and of modern liberal theory in general is a conception of human life that C. B. MacPherson has called "possessive individualism."[20] In this vision, acquisitiveness emerges as a positive, civilizing force. For as people pursue material gain, they become more rational, industrious, peaceful, and law-abiding. Hence the purely private virtues appropriate to a market society and capitalism are the virtues that build a stable political order. Of the activities that help produce a good society, none are superior to technical pursuits. As David Hume explains in his essay "Of Refinement in the Arts," "In times when industry and the arts flourish, men are kept in perpetual occupation, and enjoy, as their reward, the occupation itself, as well as those pleasures which are the fruit of their labour. The mind acquires new vigour; enlarges its powers and faculties. . . . "[21] For that reason Hume advises rulers to encourage the development of manufacturing even in preference to agriculture. Dynamic new enterprises are more civilizing than the bucolic traditions of farming.

An important feature of this persuasion in contrast to classical notions is that poli-

tics is assigned a relatively low position in the broader scheme of human affairs. For Locke, government is an instrument with no intrinsic value. Its role is to protect the rights of "life, liberty, and property" by serving as an umpire when disputes arise. Attending to governmental matters is certainly not a sphere in which a person can realize one's highest potential. Locke finds no higher meaning in the realm of citizen action. One enters the public realm merely to express one's private interests. In contrast to Aristotle's view, Lockean liberalism recognizes neither goods nor virtues that stem from one's being as a public person.

In *The Wealth of Nations* Adam Smith develops the belief in the primacy of private affairs to its logical conclusion, viewing all public interference with scorn. Government measures, he argues, have "retarded the natural progress of England towards wealth and improvement. . . . "[22] Government is the source of extravagance, misconduct, and countless ill-conceived projects while the "uniform, constant and uninterrupted effort of every man to better his condition"[23] he identifies as the wellspring of most private and public good.

> It is the highest impertinence and presumption, therefore, in kings and ministers to pretend to watch over the economy of private people, and to restrain their expense, either by sumptuary laws, or by prohibiting the importation of foreign luxuries. They are themselves always, and without any exception, the greatest spendthrifts in the society. Let them look well after their own expense, and they may safely trust private people with theirs.[24]

Ideas of this kind underlie basic institutions of politics and economics in modern liberal democracies, posing strong barriers to attempts to think about the public dimensions of technological choice. Technological change, defined as "progress," is seen as an ineluctable process in modern history, one that develops as the result of the activities of men and women seeking private good, activities which include the development of inventions and innovations that benefit all of society. To encourage progress is to encourage private inventors and entrepreneurs to work unimpeded by state interference. As later theorists in the liberal tradition modify this understanding, they notice "market externalities" that cause stress in the social system or environment. This does not alter the fundamental attitude toward economic and technical choices. The burden of proof rests on those who would interfere with beneficent workings of the market and processes of technological development.

If one compares liberal ideology about politics and technology with its classical precursors, an interesting irony emerges. In modern thought the ancient pessimism about *techne* is eventually replaced by all-out enthusiasm for technological advance. At the same time basic conceptions of politics and political membership are reformulated in ways that help create new contexts for the exercise of power and authority. Despite the radical thrust of these intellectual developments, however, the classical separation between the political and the technical spheres is strongly preserved, but

for entirely new reasons. Technology is still isolated from public life in both principle and practice. Citizens are strongly encouraged to become involved in improving modern material culture, but only in the market or other highly privatized settings. There is no moral community or public space in which technological issues are topics for deliberation, debate, and shared action.

Technology and the Quality of Contemporary Citizenship

The hollowness of modern citizenship, the paucity of citizen roles and lack of opportunities for direct participation in politics, is now a general condition, not limited to technology policy-making alone. Many writers have lamented structures of representative democracy that effectively exclude ordinary people from significant involvement in public affairs. Thus, Hannah Arendt notes with approval Thomas Jefferson's proposals that American government include "elementary republics" that might have brought small-scale political assemblies into the realm of everyday life. "What he perceived to be the mortal danger to the republic was that the Constitution had given all power to the citizens, without giving them the opportunity of *being* republicans and of *acting* as citizens."[25]

In contemporary political science, low voter turn out, citizen apathy, the triviality of political campaigns are often cited as consequences of the failure of modern democracies to include citizens in meaningful activities. Much of the recent discussion among social scientists about "participatory democracy" and "strong democracy" speculates about ways to remedy these shortcomings.[26] But other than noticing the pungent effects of television upon election campaigns and the pervasive effects of modern consumerism, social scientists seldom take note of the connection between the hollowness of modern citizenship and the social relations of technology.

In fact, the political vacuum evident in the lack of citizen roles, citizen awareness, and citizen speech within liberal democratic society is greatly magnified within today's technology-centered workplace. Devices and systems commonly used in factories, fields, shops, and offices seek productivity and profit by controlling human behavior. In such settings the spontaneity and variability of workers' activities are regarded as a cause of uncertainty and a risk for business. For that reason the physical movements and decision-making abilities of employees are subject to rational planning and centralized guidance. Rather than encourage personal autonomy, creativity, and moral responsibility, many jobs and machines are designed to eliminate these qualities altogether.[27]

One might suppose that the technical professions offer greater latitude in dealing with the moral and political dimensions of technological choice. Indeed, the codes of engineering societies mention the higher purposes of serving humanity and the public good, while universities often offer special ethics courses for students majoring in science and engineering.[28] As a practical matter, however, the moral autonomy of engi-

neering and other technical professionals is highly circumscribed. The historical evo-lution of modern engineering has placed most practitioners within business firms and government agencies where loyalty to the ends of the organization is paramount. Dur-ing the 1920s and 1930s there were serious attempts to change this pattern, to orga-nize the various fields of engineering as truly independent professions similar to medi-cine and law, attempts sometimes justified as ways to achieve more responsible control of emerging technologies. These efforts, however, were undermined by the opposition of business interests that worked to establish company loyalty as the engi-neer's central moral concern.[29] Calls for a higher degree of "ethical responsibility" among engineers are still heard in courses in technical universities and in obligatory after-dinner speeches at engineering societies. But pleas of this sort remain largely dis-ingenuous, for there are few legitimate roles or organized settings in which such re-sponsibility can be strongly expressed.

One could expand the inventory of social vocations in which moral issues in tech-nological choice might be deliberated and decided, to include business managers, public officials, and the citizenry at large. Alas, there is little evidence that anything about these roles adds qualities of ethical reflection or action missing in ordinary work-ers or technical professionals. The responsibility of business managers is to maintain the profitability of the firm, a posture that usually excludes attention to the ethics of technological choice. Where questions of responsibility arise, businessmen usually listen to hired lawyers who explain their legal liabilities. Elected officials, similarly, find little occasion to consider the moral dimensions of technological choices. Their stan-dard approach is to consult the opinions of scientific and technical experts, judging this information in ways that reflect a variety of economic and political interests. The general public may have a vague awareness of policy choices in energy, transporta-tion, biomedical technology, and the like. But its response is increasingly apathetic, reactive, and video-centered.

Under such circumstances it is not surprising to find that people who call for moral deliberation about specific technological choices find themselves isolated and belea-guered, working outside or even in defiance of established channels of power and authority. At the level of individual action one finds the hero of much contemporary writing about technology and ethics—the "whistleblower," an employee who notices something troubling in the day-to-day workings of a sociotechnical system and tries to call it to the attention of a reluctant employer or the news media. By all accounts, such behavior is often severely punished by the organizations whose actions and policies the whistleblowers criticize. When they cannot be simply ignored, whistleblowers are isolated, fired from their jobs, and then black-balled within their professions. Their lives become embroiled in exhausting efforts to show the truth of their claims and reestablish their value as employees.[30] For career-minded students who study the sto-ries of whistleblowers in university ethics courses, the underlying message is (regard-less of what their teachers may intend): this is what happens if you speak out.

At the level of collective social action the method commonly used for expressing moral concerns about technological matters is that of "public interest" or "citizens" groups. Organized around key issues of the day, such groups take it upon themselves to express the interests and concerns of an otherwise silent populace about such mat-ters as the arms race, nuclear power, environmental degradation, abortion, and many other issues. Ralph Nader, Helen Caldicott, and Jeremy Rifkin are among the contem-porary figures who have become skillful in using this persuasive approach. It is char-acteristic of interest groups of this kind to be external to established, authoritative chan-nels of decision-making power. The explicit purpose of groups identifying themselves with the "public interest" and "social responsibility" is to apply pressure, external pres-sure, upon political processes that otherwise move in what group members see as undesirable directions.

While the activities of public interest groups are clearly an exercise of the right of free speech, and while they are obviously important to the effective operation of mod-ern democracy, the very existence of these groups points to the lack of any clear, sub-stantive meaning for the term *public*. In this conception, the "public" arises *ad hoc* around certain points of social stress. One can claim to speak for "the public" simply by staging a demonstration or appearing on morning television news programs. The ease with which activists appropriate the word *public* leads to charges that particular groups are, in fact, unrepresentative, that "they don't represent my idea of the public interest." Nevertheless, public interest organizations offer the most direct means liberal democracies now have for focusing and mobilizing the concerns of ordinary people about controversial technologies.

The lack of any coherent identity for the "public" or of well-organized, legitimate channels for public participation contributes to two distinctive features of contempo-rary policy debates about technology, (1) futile rituals of expert advice and (2) intermi-nable disagreements about which choices are morally justified.

Disputes about technology policy often arise in topic areas that seem to require years of training in fields of highly esoteric, science-based knowledge. A widely ac-cepted notion about science is that it offers a precise, objective understanding of the world. Because technology is regarded as "applied science," and because the conse-quences of these applications involve such matters as complicated scientific measure-ments and the interpretation of arcane data, a common response is to turn to experts and expert research findings in hope of settling key policy questions.

This faith in scientific and technical advice involves much frustration in actual practice. Often it turns out that deep-seated uncertainties cannot be dispelled by con-sulting the experts. For the search for an objective answer brings a plurality of re-sponses rather than a simple consensus. Studying the probable effects of background radiation, for example, different fields of scientific research give very different esti-mates of possible hazards. Problems of this kind are compounded by the fact that ex-pertise is often indelibly linked to and biased by particular social interests. For exam-

ple, looking at the problem of toxic waste disposal at Love Canal near Niagara Falls, New York, in the late 1970s, different social interests proposed different scientific models of the boundaries of the question and produced drastically different estimates of the hazards to citizens living in the area.[31] If, as contemporary sociologists claim, scientific knowledge is socially constructed, then scientific findings used in policy deliberations are doubly so. To an increasing extent, lawmakers and bureaucrats see scientific studies merely as resources to be deployed in ongoing power struggles.

What this suggests is that political disputes about technology are seldom if ever settled by calling upon the advice of experts. At public hearings held before legislative bodies, different social interests parade carefully chosen scientists and technical professionals. All of them speak with a confident air of "objectivity," but the experts often do not agree. Even where there is agreement about the "facts," there are still bound to be disagreements about how the "facts" are to be interpreted or what action is appropriate as a consequence.

Another characteristic of contemporary discussions about technology policy is that, as Alasdair MacIntyre might have predicted, they involve what seem to be interminable moral controversies. In a typical dispute, one side offers policy proposals based upon what seem to be ethically sound moral arguments. Then the opposing side urges entirely different policies using arguments that appear equally well-grounded. The likelihood that the two (or more) sides can locate common ground is virtually nil. Consider the following arguments, ones fairly typical of today's technology policy debates.

1a. Conditions of international competitiveness require measures to reduce production costs. Automation realized through the computerization of office and factory work is clearly the best way to do this at present. Even though it involves eliminating jobs, rapid automation is the way to achieve the greatest good for the greatest number in advanced industrial society.

b. The strength of any economy depends upon the skills of people who actually do the work. Skills of this kind arise from traditions of practice handed down from one generation to the next. Automation that deskills the work process ought to be rejected because it undermines the well-being of workers and harms their ability to contribute to society.

2a. A great many technologies involve risks of one kind or another. Judging the risks of chemical pesticides, one must balance the social benefits they bring against the risks they pose to human health and the environment. Considering the whole spectrum of benefits and risks involved, the good in using pesticides far outweighs their possible dangers.

b. Persons have a right to be protected from harm, including possible harm that may stem from useful technological applications. The use of pesticides subjects consumers to health hazards over which they have

little or no control. Regardless of the larger good that the use of pesticides might bring, their use should be curtailed to prevent the risk of harm to individual consumers.

Positions of this kind involve a mixture of what may be highly uncertain empirical claims combined with philosophical arguments about which there is little consensus. Parties who square off in disputes of this kind usually believe that their side draws upon the very best data available and strong moral principles as well. But as the combatants circle each other in the ring, there is often a gnawing feeling that the various lines of moral reasoning have been concocted on the spot, used to justify positions that could be better described as emotional judgments or matters of sheer self-interest. In this way debates about technology policy confirm MacIntyre's argument that modern societies lack the kinds of coherent social practice that might provide firm foundations for moral judgments and public policies.[32]

What usually happens in such cases is a process of "muddling through." Interest groups apply pressure on politicians, gaining influence in proportion to the amount of money a group has to spend on the effort. Lawsuits are filed on one side or the other or both. Lawyers and judges sort through the flagrantly one-sided legal briefs, seeking precedents that might be patched together to provide a framework for deciding the case at hand. Television ads bombard viewers with flashy images and ten-second "sound bytes." Public opinion polls monitor the level of support for various proposals. Candidates for election sometimes take stands on issues that can then be included among the influences that sway voters in one direction or another. Eventually a policy outcome of some kind evolves, but it is seldom one that contains any experience of social learning that might be applied to similar episodes in the future.

Redefining Citizenship

In summary, I have argued that as moral philosophy confronts contemporary technology-related issues, it does so in an intellectual and social vacuum, one located in a deep gap between the technical and political spheres established by both ancient and modern philosophers. I have pointed to some of the consequences of this situation for thinking about technological choices and technology policies in our time. From this point of view, the technocratic approach I mentioned earlier—rushing forward with philosophical expertise to clarify moral categories, theories, and arguments in the hope that policymakers or the public will find them decisive—is a forlorn strategy. For the trouble is not that we lack good arguments and theories, but rather that modern politics simply does not provide appropriate roles and institutions in which the goal of defining the common good in technology policy is a legitimate project.

Under these circumstances a more fruitful path for philosophy is to begin exploring ways in which publics suited to renewed discussion about technological choices

and policies might be constituted. Rather than echo the judgments of Aristotle and Adam Smith that political and technical affairs are essentially different, contemporary philosophers need to examine that question anew.

Some interesting possibilities arise in the fact that at long last the conceptual and practical boundaries between technology and politics upheld in both ancient and modern theory have begun to collapse. In the world of the late twentieth century, the spheres of technical and political life have merged in a variety of ways, woven together in situations in which common forms of human living have become dependent upon and shaped by technological devices and systems in telecommunications, computing, medicine, mass production, transportation, agriculture, and the like. To an increasing extent the qualities of technical artifacts reflect the possibilities of human living, what human beings are and aspire to be. At the same time, people mirror the technologies which surround them. Each day we see a widening of the kinds of human activities and consciousness that are technically embedded and technically mediated.

Although this rapidly growing, planetary technopolis strongly influences what our lives contain, few have tried to imagine forms of citizenship appropriate to this way of being. Some observers are content to point out the obvious, namely that technology is already highly politicized, that the development, introduction, and use of technologies of various kinds are always shaped by conflicts, negotiations, and machinations among powerful social interests. But to notice this fact is by no means to acknowledge the technopolitical sphere as a public space where citizen deliberation and action ought to be encouraged. To take that step, one must move beyond supposedly neutral sociological descriptions and explanations of how technologies arise and begin raising questions about the proper relationship between democratic citizenship and the shaping of technological order.[33]

Attempts of this kind have been launched recently in several modest experiments within the Scandinavian social democracies. These experiments are interesting in their own right, but also show the promise of creating citizen roles in places where private calculations of efficiency and effectiveness, costs, risks, benefits, and profits usually rule the day. A prototype of this variety of technological citizenship took shape at a research institute in Stockholm, the Center for Working Life. The basic goal of the Center's work was to expand the scope of Scandinavian ideals of worker democracy in which technological innovation was likely to occur. They were encouraged by Swedish laws passed in the middle 1970s that recognized the right of all parties in the workplace, managers and workers alike, to negotiate about matters that affect the quality of working life. The "co-determination laws" cover such areas as job allocation, training, and work environment. Beginning in the 1970s, legal rights of this kind were carried in a novel direction by a group of labor unions working with university-educated computer scientists and systems designers. Realizing that computerization was likely to transform Swedish factories, shops, and offices, fearing the loss of jobs and workers'

skills, the teams set out to investigate the new technologies and to explore possible alternatives.[34]

In one such case, the UTOPIA project of the early 1980s, workers in the Swedish newspaper industry—typesetters, lithographers, graphic artists, and the like—joined with representatives from management and with university computer scientists to design a new system of computerized graphics used in newspaper layout and typesetting. The first phase of the project was to survey existing work practices, techniques, and training in the graphic industries. The group then formed a design workshop to consider possibilities for a new system, using a paper-and-plywood mock-up as the model of a newspaper workstation. From there they produced a forty-eight-page technical document giving precise design specifications to the computer suppliers.

The pilot system, installed at the Stockholm daily newspaper *Aftonbladet*, offers a pattern of hardware, software, and human relationship very different from what would have been produced by managers and engineers alone. It allows graphics workers considerable latitude in arranging texts and images, retaining many of their traditional skills, but realizing them in a computerized form. In their deliberations, project members considered but rejected the pre-packed graphics programs promoted by vendors from the United States because they reflected an "anti-democratic and de-skilling approach."[35] As project member and computer scientist Pelle Ehn observes, "What was new was that these technical requirements were derived from the principle that the equipment should serve *as tools for skilled work* and for production of *good use quality products*."[36]

The "Scandinavian approach" to participation in design is interesting not only for its tangible results but also for what it suggests about a positive politics of technology seen in broader perspective. In a small and tentative manner, the UTOPIA project created a public space for the political deliberation about the qualities of an emerging technical artifact. A diverse set of needs, viewpoints, and priorities came together to determine which material and social patterns would be designed, built, and put into operation. As Pelle Ehn points out, the important step in this process was to find a "project language game" in which all the participants from very different vocations, professions, and social backgrounds could speak to each other.[37] True, it was a fairly limited public that was constituted here. But it was far more inclusive than is normally the case in the printing industry or elsewhere.[38]

The creation of public spaces of this kind is, of course, predicated on modifying the right of owners of private property to have exclusive or even primary control of the shape of new technologies that affect how others live. That condition is, to a great extent, an accomplishment peculiar to Scandinavian social democracy, a product of political conflicts and agreements over the past several decades. It is now a condition sustained by the fact that more than 80 percent of Swedish workers are union members.[39]

Another achievement of the "Scandinavian approach" is to eliminate what I noted earlier as one of the most troubling features in contemporary technology policy: the ritual of expertise. In the UTOPIA project and others similar to it, a person's initial lack of knowledge of a domain of complex technical knowledge does not create a barrier to participation. The information and ideas needed to participate are mastered as part of a process in which the equality of team members is the established norm. Working from the opposite direction, those who came to the process with university degrees and professional qualifications explicitly rejected the idea that they were the designated, authoritative problem-solvers. Instead they offered themselves as persons whose knowledge of computers and systems design could contribute to discussions conducted in democratic ways.

This approach may also help dispel the second disturbing feature of contemporary technology policy debates, the interminable moral controversies they tend to generate. Here the guiding assumption is that if people with diverse viewpoints and conflicting social interests come together as equals in a situation that presents a common problem to be solved, an agreement will eventually evolve. As Ehn describes a typical predicament, "Management introduces new technology to save manpower. Journalists, graphics workers, and administrative staff confront each other in the struggle over a decreasing number of jobs. Is there a basis for solving these demarcation disputes across professional and union-based frontiers? Can a new way of organizing work create peaceful coexistence in the borderland?"[40] The answer seems to be yes. However, the answer is never as simple as one set of philosophically well-grounded prescriptions winning out over another. Instead what happens is a negotiated political agreement among those whose interests will be affected by the change.

What the Scandinavian projects have done in an experimental way is to institute technopolitical practices from which new citizen virtues call emerge. Within small communities constituted for the purpose, choices about technologies that will influence the quality of social life are carefully studied and debated. This involves no expectations of political heroism, only the sense that ordinary people, regardless of background or prior expertise, are capable of taking a turn making decisions of this kind.[41] The vision of knowledge and social policy that underlies these efforts strongly resembles Paul Feyerabend's anarchistic proposals for "committees of laymen" involved in science.[42] In this instance, however, there was an opportunity to test the ideas in actual practice.

As revealed by Ehn's engaging treatise *Work-Oriented Design of Computer Artifacts*, the role of philosophy in this process is a limited but useful one. It attempts to clarify the basic conditions that undergird practices of work and discourse within the design projects. By seeking to understand these practices at a deeper, more general level, philosophical inquiry may shed light on ongoing negotiations as they occur. Thus, Ehn draws upon the writings of Heidegger, Wittgenstein, Habermas, and other philosophers to illuminate his central concerns.[43] In the ideal case, philosophical re-

flection becomes one element in the process, although not one given privileged status. For it is understood that the key insights, lessons, and prescriptions must arise from a process in which project members, regarded as equals, join to explore the properties of both technical artifacts and social arrangements in a variety of configurations.

A criticism that might be raised about approaches like that pursued by Ehn and his Scandinavian colleagues is that they work at a superficial level within the technologies they confront. As the historian of technology Ulrich Wengenroth has noted, there is today a widening gap between "professionalization" and "trivialization" in many fields of technological development. Deeper, more complex levels of technical design and operation—the making of computer chips, for example—are accessible to and acted upon by only a handful of technical professionals. The same technologies are, however, restructured at the level of the user interface and present themselves in a deceptively friendly form. As Wegenroth observes, "If a new technology is met by suspicion and resistance in society, its acceptance is not won by reducing its complexity to make it intelligible and thus controllable by the general public, but by reengineering its interface to trivialize it."[44]

Do the Scandinavian projects merely retailor interfaces to make them more agreeable to workers while leaving the deeper structures of the technology as something given? The question cannot be answered in this brief overview. It is worth noting, however, that within the domain of computer programming the innovations of the Scandinavian researchers appear to be fairly deep-seeking. As noted, members of the UTOPIA project rejected an American firm's software package because it contained entrenched forms of hierarchical work organization, features that the group found "anti-democratic and de-skilling." Rather than try to weed out the deep-seated authoritarianism of American computer programs, the UTOPIA project elected to start from scratch.[45]

It is perhaps too early to characterize the virtues of citizen participation that might emerge from practices of this kind, too soon to specify whether this experience might be successfully applied to realms of technological choice usually governed by the merciless logic of economic and technical rationalization.[46] Members of the UTOPIA project appear to have developed a sense of cooperation, caution, and concern for the justice of their decisions. They were especially conscientious in trying to find effective designs that could take advantage of computer power while preserving the qualities of traditional workmanship. The members realized that conditions expressed in the design of a new system were conditions they would eventually have to live with. In that way their work echoes Aristotle's definition of the virtue of the good citizen, namely an understanding of both how to rule and be ruled. At a time in which politics and technology are thoroughly interwoven, perhaps a similar definition of the virtue of citizens is that they know both how to participate in the shaping of technologies of various kinds and how to accept the shaping force that these technologies will eventually impose.

From this viewpoint the creation of arenas for the politics of technological choice is much more than a way of solving unsettling problems that arise in the course of technological change, although steps of this kind certainly might do that. It is also more than finding alternatives to the increasingly absurd logic of efficiency, productivity, and control that now drives technological choices in the global economy, although there is certainly a need for such alternatives. Even more important, the creation of new spaces and roles for technological choice might lead us to affirm a missing feature in modern citizenship: the freedom experienced in communities where making things and taking action are one and the same.

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4. As Plato explains in *The Republic*, the real table is not that made by a craftsman, but the table that exists as an ideal form in the transcendent realm. Attempts to define the good society must understand this, seeking true rather than debased foundations for political practice. For that reason, Plato places the arts and crafts in the lowest of three social classes, and removes from them any chance of holding power. While he recognizes that agriculture, medicine, architecture, and the other practical arts are necessary to the life of the state, they offer nothing of value in ruling a good society. In both *The Republic* and *The Laws*, Plato advises those who would rule to stay as far away from mundane technical activities as possible. See my discussion of Plato's views in *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (Chicago: University of Chicago Press, 1986), chapter 3.

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38. In fact, problems arose within the UTOPIA project because it was not inclusive enough, excluding the participation of journalists. As Ehn notes, the future of the project "depends upon whether the graphic workers and journalists succeed in overcoming their professional clash of interests, and together develop a common strategy." Ehn, op. cit., p. 357.

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The Moral Significance of the Material Culture

Albert Borgmann

MODERN PHILOSOPHY HAS been at two removes from the real world. First, in aspiring to theory, it has been distanced from practice. Theory can inform practice, but practice is richer than theory and, above all, self-sustaining. Practice can survive without theory while theory arises from a practice and perishes without the nourishment of a practice. Practice, as philosophers have always seen it, is in turn removed from its tangible setting. Yet material culture constrains and details practice decisively. Practice, abstracted from its tangible circumstances, is reduced to gesturing and sometimes to posturing.

Philosophy as we know it began with Plato, and in the beginning material reality was thought to be the adversary and seducer of philosophy. To philosophize was to rise above the tangible phenomena to the intelligible ideas. And while Aristotle acknowledged the life of pleasure and the life of honor and action, it is the life of contemplation that constitutes human fulfillment. Contemplation in Greek is *theoria*; with Aristotle the word and the vision that were to rule philosophy came to the fore. They continued their reign through the Middle Ages where the *vita contemplativa* was considered superior to the *vita activa*.

Practice, to be sure, was never far from ancient and medieval theory. To know the good is to do the good, says Plato. Virtue, says Aristotle, is a skilled practice. The 119 metaphysical questions of Thomas Aquinas's *Summa Theologica* are followed by 303 questions on ethics, 189 of them on virtues. Practice, in turn, overshadowed tangible reality. Why? Practice, for the ancients and medievals, was enacted on a solid and familiar stage. Nature presented the powerful and regular backdrop of human life. Material culture presented a similarly firm and surveyable precinct. Where it changed, it did so, within any two or three generations, slowly and only in part. Not that the ancients and medievals were entirely unconcerned about the material world. They worried that it might provoke recklessness in the way humans shape it to their purposes and extravagance in the way they enjoy it. But all in all they took the material culture to be so solid and familiar that its direct bearing on philosophy could be handled in