

Short communication

Global citizenship and the real world of technology[☆]

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Abstract

The article opposes a naive conception of technology with the emphasis on material artifacts and supports the view that the “real world of technology” and its problems have to be understood in terms of systems. Technology forms a new environment, a shared house in which we all dwell today. From this viewpoint the paper argues about new moral and political responsibilities with which citizens are confronted in the emerging global technical system. It is pointed out that the same processes underlying the technological integration of the world and the globalization of society also seem to awaken new modes of citizenship in a global civil society. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Technology usually calls to mind all the machines and technical appliances with which we surround ourselves and use for many purposes. We turn on the television to learn what is happening in our world — locally and far away. We push our shopping cart filled with groceries to a cashier who passes each item over a screen that reads bar codes on items we have placed on the conveyor belt. We use the mouse on our computer to click on “print”, and the article we have just written rolls

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from our printer. Paper in hand, we walk to a photocopier and quickly produce several copies. We pick up the telephone for a moment's contact with someone nearby or miles away. With another click of a button, we send e-mail via the Internet and download information we seek. We step into a car, train, or airplane to go to work or on vacation. In every facet of life, technology helps us achieve our everyday objectives.

This brief description of our world of technology could be called "naive" — not in the pejorative sense, but in the simplistic description of what technology is doing in support of these everyday experiences. Copernicus notwithstanding, we still say the sun comes up in the morning and goes down at night. This simple, but nevertheless incorrect, explanation has lost none of its meaning in our everyday lives. But at a higher level of complexity, to understand certain phenomena, we do have to know that the sun does not orbit the earth and that it forms the fixed center point of the solar system.

Something similar, it seems to me, applies to the way we speak about technology. Thus, in order to grasp the significance of technology as a knowledgeable global citizen, I shall refrain from the kinds of naive descriptions of technology expressed above, and instead penetrate the "real world of technology" that underlies our everyday experience.

2. The real world of technology

One of the first striking elements to notice when we move away from a naive description of technology is the emphasis on material artifacts. Descriptive words focus on appliances, instruments, and machines. Directly connected to this emphasis is a second characteristic of the naive conception of technology. We use the devices at our disposal to perform certain operations; we do something with them. Technology at the level of an artifact involves the action of individuals. The technological world is portrayed as a collection of things that individuals can use to achieve goals. Just as we use a hammer to drive a nail into the wall, or a rake and shovel to trim the garden, so also, according to the naive conception of technology, do we send e-mail by computer and drive to work by car. The auto and the computer are nothing more than objects of human use that facilitate accomplishments.

It should not be surprising that the naive conception of technology, referring both to a person acting individually and to everyday experience, originally permeated the philosophy of technology. Ernst Kapp (1808–1896), often regarded as one of the first philosophers of technology and the first person to use the term "philosophy of technology", defended the model of technology as a projection of human organs. To Kapp, there is an intrinsic connection between the organs of the human body and the technological tools that people have produced throughout history. In his tools, man constantly represents himself. Thus, the hand is the natural instrument that continues by extension in the diversity of hand tools bequeathed to mankind by primitive cultures. "The bent finger becomes a hook, the hollow of the hand a bowl; in the sword, spear, oar, shovel, rake, plow and spade one observes sundry positions of

arm, hand, and fingers, the adaptation of which to hunting, fishing, gardening, and field tools is readily apparent” [1:45]. Citing examples from our own era, one could say that the crane is a projection of the human arm and the bulldozer of the human hand.

Many who have thought deeply about technology have abandoned this naive view of technology. Ursula Franklin, an emeritus professor of physics at the University of Toronto, published a fascinating book about “the real world of technology.” In it she discusses the various models that underlie our ideas and discussions about technology. “Technology,” according to Franklin, “is not the sum of the artifacts, of the wheels and the gears, of the rails and electronic transmitters. Technology is a system. It entails far more than its individual material components. Technology involves organization, procedures, symbols, new words, equations, and, most of all, a mindset” [2:12]. In depicting technology as a system, Franklin represents a widely shared view. The systems thinker and biologist Von Bertalanffy observed, for example, that the development of technology led to a different approach to technology, not in terms of independent machines, as was long customary, but in terms of systems. The use of auto, train, and airplane depends on an infrastructure or system. Using an auto presupposes a road network with a complex system of rules for its use, prescriptions for maintenance, financial regulations, and the like. From both the user’s and the designer’s viewpoint, the systems character of technology makes itself felt. One makes use of a car, train, or airplane along with others, and in so doing participates in a collective traffic system. Designers would agree with Von Bertalanffy who said, “air or even automobile traffic is not just a matter of the number of vehicles in operation, but is a system to be planned or arranged” [3:2].

Accordingly, the systems character of technology means recognizing the connections between material artifacts. The traffic system as a technological system is composed of a great variety of components. Thinking about technology in terms of systems also means seeing that such systems function through the participation of many different agents. The “real world of technology” that underlies the material artifacts surrounding us is composed of countless systems. Technology is not a gadget or apparatus that stands apart from us as an external object but it is the “house” in which we all dwell today. Technology determines the public space in our existence. If we utilize technology by driving our car to work, we participate in one of the systems within which modern society takes place. Technology is not a matter of individual actions but of collective forms of action in which modern, so-called “technological society” [4,5] takes shape.

3. Citizenship and technology

The Copernican-like insight that technology does not consist of a multiplicity of independent things in our environment but that, on the contrary, technology itself forms our environment, has important implications. The development in technology, from artifact to the shared house in which we all dwell, has totally altered our social order — not only relations between individuals and within social connections and

groups, but also relations between nations and individuals, between nations in international intercourse, and between all of us and our natural surroundings. This still rather new situation confronts us with fresh questions at the level of ethics and politics, questions concerning our moral and political responsibility in a world of technology [6].

One of my favorite texts for introducing students of information theory to a course in the philosophy and ethics of technology is an essay by Langdon Winner in which the writer criticizes the case study approach so often used in teaching ethics to aspiring professional technicians [7:53–64]. He argues that in an endeavor to relate the lessons in ethics to actual practice in the most telling way possible, precisely that which is most important is lost to view. To illustrate his thesis, Winner uses the following example of a case: “You are an engineer working for a defense contractor helping to assemble the latest version of the cruise missile. One day you discover that the paint used on the shell of the missile is emitting toxic fumes that may be dangerous to people working in the assembly plant. The project is behind schedule and your boss has made it clear that it must be completed within deadline. Should you blow the whistle on the toxic fumes or keep silent thereby avoiding risk to your own job and career?” [7:53].

One of the difficulties with paper casuistry, of course, is that a concrete situation must always be described through a selection of the facts, and the moral problem is therefore always already identified, implicitly or explicitly, in the description of the case. When students are confronted with such a description in an academic context, they likely miss what is most important for forming morals, namely, the recognition of moral dilemmas in practical situations they themselves might be involved in. However, this is not Winner’s objection to argument in ethical education. His concern is not that identifying a moral problem requires a selection of facts as presented in a case study. The heart of his criticism is that the technician’s practical situation is separated from the broader socio-cultural implications. The moral problem is thereby narrowed to one of individual ethics: “Should you blow the whistle?” That is the question ultimately confronting the student. The societal objectives to which the technician’s work contributes are left out of consideration. Attention is instead focused on situations that appear within broader contexts that are excused from critical review, such as building thermonuclear weapons, as in the case above.

Ethical education of this sort, Winner observes correctly, tends to legitimate and reinforce the *status quo* [7:54]. Students learn to cope with moral dilemmas in their professional activities and gain insight into questions at the level of individual ethics, but they are not made conscious of the political and societal dimensions that are also the responsibility of the technical expert. Technology and politics remain separate domains for them.

While I do not question the usefulness or the need for programs in ethics in university curricula, their possibilities should not be overestimated [8]. One can hope that educational efforts will contribute to a clear consciousness of broader societal responsibility in the technical professions. Yet even the best instruction cannot eliminate the gap between technology and ethics. Winner [9] seems quite aware of this. He does not hesitate to speak of a vacuum in ethics when it comes to important

choices in our society involving the application and development of new technologies. A similar note is struck by Jonas [10]. This philosopher of technology, while seeking to articulate a new ethics for our technological times, adopts the term “ethical vacuum”.

In connection with both these thinkers, I have three things to offer about this matter. First, the ethical vacuum has an intellectual background. The development of technology and the Copernican revolution in the conception of technology that goes with it — from artifact to system — makes mandatory the formation of new ethical theories as well. Technology, according to Jonas, confronts us with entirely new dimensions of human power and a qualitative change in the realm of human action. Modern technology, if considered as the environment in which we live, also means the interweaving of individual human actions that amplify one another. It is not an individual agent or an individual act but the aggregate, the collective subject, that is characteristic of various processes in the era of technology. The emission of CO₂ into the environment by traffic, households, and industry, resulting in the greenhouse effect, is a familiar example. In traditional situations, an action and its effects could be identified with a fair degree of certainty, but that is ever less possible given this interweaving of factors. Thus, one of the problems we face is to stimulate ethical theory formation for a field of collective human action [8:278–79].

Second, the ethical vacuum has a social or political component. That is, one of the consequences of interdependence that marks our technological environment is that it is difficult if not impossible to identify the agents, whether persons or organizations, that have the authority to take the necessary decisions. In our capitalistic, liberal–democratic complex with its free-market economy, clearly defined social channels and institutions for identifying important moral issues and dealing with them effectively simply do not exist. “Typically, what happens in such cases,” according to Winner, “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” [9:65].

Jonas also wrestles with this problem, even weighing, at the theoretical level, the pros and cons of an absolute civil authority led by a well-informed elite [10:147]. It is silly to accuse him, as has been done, of championing a global eco-dictatorship. Such a criticism simply evades an unresolved and apparently inherent problem of our current social–political order, namely, how democratic citizenship and the responsible shaping of our technological society can be made to rhyme. Is it possible to cultivate in our liberal democracies a form of citizenship that can steer and, on a world scale, provide guidance to the current processes of technologizing and globalizing society? Here we touch upon a question to which we must return. First, however, a third — and to my mind the most fundamental — aspect of the ethical vacuum.

It is true that the moral impotence affecting some segments of society has something to do with intellectual shortcomings and with the absence of the political structures necessary for guiding our technological world along paths that are good. Yet, the solution we seek cannot be found solely in the latest discoveries from the laboratories of today’s “ethical engineers”, or in the implementation of improved demo-

cratic procedures for consultation and decision making. The situation we confront, in which we are adrift, on the one hand, but must deal with the enormous planetary dynamics of technology, on the other hand, is not just an accidental and highly unfortunate coincidence. Jonas describes it well: “For the very same movement which put us in possession of the powers that have to be regulated by norms — the movement of modern knowledge called science — has by a necessary complementarity eroded the foundations from which norms could be derived; it has destroyed the very idea of norm as such” [10:22].

The fact that our technological world has come to lack a moral compass is, at bottom, a spiritual and religious matter having, as it were, metaphysical roots. “First it was nature that was neutralized with respect to value, then man himself. Now we shiver in the nakedness of a nihilism in which near-omnipotence is paired with near-emptiness, greatest capacity with knowing least for which ends to use it” [10:23]. This assessment of our situation does not lead Jonas to accept the claim of his mentor Heidegger, that “only a god can save us now” [11]. Religion and an appeal to God do not relieve ethics of its proper task. To be sure, Jonas expressly seeks a metaphysical anchor for the new ethics, with the “heuristic of fear” as its most important rule.

It is tempting to discuss here more broadly the relations between religion and ethics, particularly because “fear” interpreted, as the “fear of the Lord” is also a key notion in the biblical tradition. Resisting this temptation, however, I return to the subject at hand in order to say something about the idea of citizenship: is technology out of control by the human agency in the emerging world system or does globalization offer new possibilities to the citizen who is consciously participating in the global technological society?

4. Global citizenship

Thinking globally is much in vogue today, at least in the industrialized countries of the world. As such, “globalization” has become a magical word. Although it is not always clear precisely what the term means, it is a matter for constant and animated discussion in scientific circles, particularly among economists and sociologists, and leading figures in industry and politics. Telling for the importance of the subject is the fact that in my country, the Netherlands, one of the most prominent political figures since the Second World War, Ruud Lubbers, following his departure from the political arena, accepted an appointment as a Professor of Economic Globalization.

Also striking in the stream of publications about globalization is the strong emphasis on economics. There are allusions to the world economy, to market globalization, the growth of multinational companies, and the role of competition. The role of technology is acknowledged, but to my mind that role is still insufficiently understood inasmuch as I believe it is still the naive conception of technology that comes through in most of the thinking. In his monumental study, Manuel Castells adopts the revolution in information technology as his “entry point in analyzing the complexity of new economy, society, and culture in the making” [12:5]. This methodological choice, which he emphatically justifies, does not mean that in his view new

social forms and processes are purely a consequence of technological change. The writer rejects not only technological determinism but also its reverse, the concept that society does not follow but rather that it determines technological development. Technological determinism places us before a false dilemma, according to Castells, “since technology *is* society, and society cannot be understood or represented without its technological tools” [12:5]. Technology and society cannot simply be juxtaposed as independent entities. Although I agree with Castells’ statement that our “technological tools” are indeed a part of society, and society avails itself of these “technological tools”, I would emphasize that technology can no longer be understood as a collection of human “tools.” Society has become a system, a world in which we live and within which “technological tools” have been interwoven and within which they fulfill their function.

What is today called “globalization” is actually nothing more than some fundamental structural changes in a world technological system that has existed for some time. Technology that is considered as humanity’s habitat is by nature unimpeded by national boundaries. That is also true of the effects of technology on the natural environment. “Global warming”, for example, represents the reverse side of the “global technical system.” The boundary-exceeding technological infrastructures of communications, traffic, and transport have been transformed in recent decades by information and computer technology into gargantuan “megamachines”, to borrow a term from a fascinating study of globalization by the Group of Lisbon, created on the initiative of Riccardo Petrella, head of the Forecasting and Assessment in Science and Technology (FAST) program at the Commission of the European Union in Brussels and professor at the Catholic University of Louvain. “Air traffic is constantly being integrated by increasingly sophisticated computer monitoring and control systems; airplanes themselves are being transformed into flying terminals of a global computer system. A megamachine is growing” [13:4]. In the same development that has required pilots to yield control of their aircraft to a megamachine that embraces the entire globe, national authorities lose control of their airlines and skies. A development similar to the one in air traffic may be observed in automobile traffic. There, too, there is a development in the direction of a “global transportation machine”, controlled in large measure by the large auto manufacturers and oil companies.

Against the background of these developments in the technological system, the phenomenon of globalization takes shape. In the environment of megatechnological structures, there would seem to be little or no future for democratic control and steersmanship [14]. Globalization and the progressive technologizing of our habitat through its translation into information and computerization are coherent processes in what would appear to be an unstoppable movement over which we have lost every possibility of socio-political control. “New technologies make the boundaries ever more permeable,” observes Lubbers. “That is globalization” [15]. However, that has led to vitiation of national policies geared to particular territories. While a national regime may have some degree of power to restrict the economy and its interaction with technological innovation, the market will prevail in the end. That is why our politicians sigh with increasing frequency and intensity: we can do nothing, for if

we raise taxes our firms will relocate across the border. More and more, the technological order of modern society begins to exhibit totalitarian features.

The conclusion to be drawn is that with the globalization of society, the political dimension tends to shrivel into insignificance. Democratic citizenship cannot enter or penetrate the world technological order, which seems to obey only the rules of its own dynamics. In the view of the Group of Lisbon the current situation demands therefore a new type of global governance. More in particular a need exists for the development of a new generation of social contracts on a global scale. Societies today are confronted with the same problem as nineteenth- and early twentieth-century societies. The difference lies in the scale of the problem. As a promoter and guarantor of the public interest, the state intervened and bridled the excesses of competitive capitalism on a national scale. Today we have to find policies on a global scale. The most important goal in the era of globalization does not relate to higher competitiveness in global economic wars, but should be concerned with identifying solutions to satisfy the material and immaterial needs of the world's population.

It is precisely in this context that the idea of the *civil society* is gaining renewed importance and comes to the fore in the political debate. In the debate the term “civil society” has multiple meanings, however [16,17]. In the approach of the Group of Lisbon the civil society is pictured as a middle ground, differing from both state and market. Traditionally the nation-state protects the public good. In the market which is regulated by competition, private producers and consumers exchange goods and services. In the civil society, private individuals and groups freely join together inspired by common ideals. They include a wide range of movements and organizations such as Greenpeace, Amnesty International, the Red Cross and many other examples. Now that the power of traditional politics has been vitiated to the point that it can offer little resistance to the preponderance of the technological-economic complex, we are witnessing the rise of countless organized social groups and institutions that desire to reassert fundamental human values at various levels — local, national and planetary. Through processes of technologizing and globalization, people are also better connected with one another worldwide. The same forces that power the world technological system onward seem to awaken new forms of citizenship in a global civil society offering a global capacity for political innovative behavior. The Group of Lisbon puts it this way: “Despite the importance of global imagery and the infrastructure of information and communications technologies, they are not the primary forces in the making of the global world. The primary creators of the global world are people, their value systems, and the means they employ to achieve their goals” [13:14].

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