ADVANCES IN THE PHILOSOPHY OF TECHNOLOGY

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INTRODUCTION

Evandro Agazzi, University of Fribourg, and Hans Lenk, University of Karlsruhe

In philosophy proper, thus far, technology and technics have been rather poorly represented. Their stature is low because of a tendency to class them amongst merely practical things in merely practical realms—while "real philosophy" is thought of as dealing with fundamental, primarily theoretical problems. And this is so despite a respectable tradition in the modern era, notably highlighted by Immanuel Kant, of granting primacy to practical philosophy (unfortunately, most often only in principle or in theoretical terms).

With the exponentially-increasing growth in the realm of industrialization, it has become clear that technology will inevitably gain a prominent and important place in the modern world. Nonetheless, problems of technology have been largely ignored by philosophers. Although a few specialized books on philosophy of technology were published in the nineteenth century (for example, by Beckmann in 1806 and Kapp in 1877), they were largely ignored by mainstream philosophers. Only relatively recently have philosophers with international reputations begun to emphasize the importance—indeed, the central role—of technology in the history of humankind, and notably in the modern era.

Karl Jaspers and Martin Heidegger have stressed technology as the fate of humankind. Jaspers called technology "the main problem" (*Hauptproblem*) of our modern situation. And Heidegger (in *Vorträge und Aufsätze*, 1967, p. 72) called "technique," or technology, our "perfected metaphysics" (*vollendete Metaphysik*). According to Heidegger, technology is "essentially" identical with modern metaphysics, providing for us a kind of metaphysical constitution of the world that is presupposed as the fundamental core of any human possibility or opportunity of

action or potentiality of world-making. In technology, humans confront nature, they corner it like game brought to bay—and they do so according to a fundamental necessity of *anticipatory* confrontation, where instrumentation offers the conditions or requirements for human action, even survival. Thus, technology, with its ever-increasing growth and acceleration, seems not to remain a mere universe of instruments. Instead, it seems to impose itself as a fundamental trait or factor of modern world-making—at least if we are thinking about changing the world or reshaping its character.

In this sense, technology seems to have become the total fate of humankind. Is it a good fate or a bad fate? That is a question that is gaining ever more prominence, especially as all of us, because of overpopulation problems on a planetary scale, become quite literally dependent on improvements in technology—which then requires the controlling of its rampant proliferation or acceleration.

In contradistinction to Heidegger's diagnosis, that technology has become the metaphysical fate of Being today, independent of human life and action, we believe that technology and the technological world are human-made; if technology has any "ontological" or "metaphysical" character, it is only because humans have granted it such, based on human or anthropological (not metaphysical) considerations. Humans today are, indeed, dependent on technology; however, on the other hand, humankind has never had greater scope for action, greater energy, or greater potential than is the case today. And this is precisely (for good or ill) because of the increase of technological power, as technology gets ever more systematized and takes over more and more realms.

What all of this means is that, even if technology is the fate of humankind, the fateful aspect is of secondary importance: our world is human-made, and we must shoulder our responsibilities. Humankind cannot avoid or evade its responsibility precisely for the technological world, for all the features of technology. Neither can the human race overlook its duties toward the environment—at the global, regional, or national level—while attributing technological development to some non-personal, non-human factor (like Heidegger's fate of Being). It is not Being but humans who have expanded their powers at an exponentially accelerating rate; and it is this technological growth, with its drastic encroachments on nature and the global ecosystem, that we have to

fear. In proportion to the growth of the power of technology, human—yes, humankind's—responsibility must grow at the same pace.

On the other hand, problems of the responsibility for large-scale technological development and environmental degradation—problems of maintaining the biosphere as "humanity's living room" (along with all the plant and animal species with which we must coexist)—seem to fade away, to escape being assigned to any individual bearers. Technological power seems to run rampant, to escape domestication or taming or getting worn down by any responsible human action.

This leads to a further development. A worldwide "technopolitics" seems to be called for in order to avoid the traps that nature and society lay before us in the form of human disillusions, pollution, and the exhaustion of systems and natural resources. World-scale technology assessments, and social and environmental impact assessments have become a matter of necessity. In particular, preventive measures to avoid imminent problems of climate and the environment are urgent issues *now*. Traditional social and political structures, including nation states and loose confederations, do not seem adequate to deal with the dramatic, ever-accelerating problems of the contemporary world on planet Earth.

To that extent, Jaspers and Heidegger were right on at least one point: a philosophy adequate to deal with technological problems cannot any longer rely, for ethical responses, on the practical reason of individual persons' insights. Politically pressing problems of major import—planning, just distribution, public participation, effective social organization—all of these are now urgent on a world scale. But large-scale problems of this nature have scarcely been mentioned in traditional philosophy of technology of the Jaspers/Heidegger sort. Meanwhile, they have taken center stage in the international political arena—as in the world environment and world climate conferences at Rio de Janeiro and Kyoto.

Another point: it is not only the environment and the biosphere that have been shaped by technological development with its systemic interconnections and interactions. The social, political, and information realms have also come to be characterized by new features—especially information networks and related systems technologies, which have gained prominence and had ever-increasing

impacts in recent decades. Even traditional technologies have come to be dominated by computer and information technologies, by multimedia electronic systems—and by the managerial approach associated with them. And this trend, like the others mentioned here, is also accelerating exponentially.

Technics are older than science, and the technics of ancient history were later transformed by craft techniques; then these gave way to science-based technology. Now it has become all too apparent that systems technologies—computer-generated, computer-assisted, and computer-guided on the basis of information, software, and systems management—have come to dominate the scene. And all of this requires management by large, complex, dynamic social systems—so-called "socio-technical systems"—that in turn require large-scale organization, systems management, and even systems engineering. In fact, systems engineering—involving large-scale organization, management, and information-based strategies such as operations research—has become increasingly prominent and important.

All of these developments call for new methods in the philosophy of technology. Not only does philosophy of technology have new anthropological, social, and political problems to deal with; it must also wrestle with complex and new methodological problems. These involve relationships and interactions between the sciences and various technical disciplines, as well as problems of the reliability (even the continued viability) of traditional technology assessment, environmental impact assessment, social impact, and planning methodologies.

This leaves many tasks to be undertaken, much business to be done by philosophers of technology, both now and in the future. So it seemed natural and worthwhile for the International Academy of the Philosophy of Science to address these problems of a new and modern philosophy of technology. This world-renowned organization took up the challenge at an international conference in Karlsruhe, Germany, May 20-26, 1997, under the title, "Advances in the Philosophy of Technology." More than 65 participants— philosophers, scientists, and graduate students from 22 countries—took part in the sessions, which touched on all the topics mentioned here, but in a practice-oriented fashion. Everything from general topics—such as the relations between science and technology, technology and culture, and the ethics of technology—to special fields of applied technology was dealt with. A selection of papers from the conference is presented

here in the Society for Philosophy and Technology's quarterly electronic journal. These papers will fill all four issues of volume 4 of the journal.

On behalf of the *Academie Internationale de Philosophie des Sciences*, we thank all the speakers at the conference, the contributors to this volume, and the Society for Philosophy and Technology, including the general editor of its publications and its current president, Paul Durbin.

We would like also to add one final note. The board of the Academy chose Karlsruhe for this conference because of the long history of the University of Karlsruhe, founded in 1825 as the first Technical University in Germany. For over a century, Karlsruhe has been recognized not only for its engineering and technical contributions, but also for work in Engineering Philosophy, Engineering Ethics, and Philosophy of Technology. Especially noteworthy have been contributions of Eberhard Zschimmer and Simon Moser. One of us (Hans Lenk) will summarize some of these accomplishments in one of the papers included here.