

## BIOS AND TECHNOLOGY - PHILOSOPHICAL CONTROVERSIES

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The relationship between life and technology - bios and techne - is not a new one, neither in the sense of actual existence nor as a subject of philosophical thinking. It comes first into being with the appearance and development of technology, that is with the appearance of man, technology being his inherent characteristic and creation - "there is no man without technology, there is no technology without man." Next, it appears with the beginning of the human search for an explanation of the sense of the world and man in ancient Greek philosophy when the very concepts of techne and philosophia were created. However, it is only in our time, often defined as an "epoch of technology," that this relationship assumes new and dramatic dimensions and becomes vitally important - a matter of destiny of man. It is no wonder, then, in the philosophical and scientific works of many prominent contemporary thinkers, that it is treated either as a part of their whole opus, or as a separate philosophy of technics of technology. To put it simply, it is impossible to disassociate the problems of life in general, and of human life in particular, from the increasingly important and decisive presence, functioning and influence of technology, both in the present and the future, to the extent that it can be foreseen or guessed at. We could even say that philosophy of our age has to take into account the impact or shock of technology on contemporary man, his society and the universe.

This relation is a very complex and controversial one and can therefore be analyzed from many different points of view -- biological, technological, philosophical, economical, sociological, juridical, political etc. - just the way it was considered in the already rich and ever-growing literature. I cannot pretend to analyze, nor even to mention, all of these essential aspects in this brief communication. I am bound to pick a few questions only, concentrating on controversies which have been manifest in the assessment of the importance, scope and effects of the rapid technological growth on the crucial questions of the human situation and life as a whole. In addition, I will try to outline the main thoughts on overcoming the present crisis which characterizes this relation. In doing so, I can hardly aspire to tell something especially new. It was long ago said, resignedly, but truly enough, that nihil novi sub sole. If it is true anywhere, it certainly is here, under this Greek Athenian sun, which witnessed that miraculous, wonderful blooming of wisdom from which we cannot -- and must not -- stop learning and becoming inspired.

One could ask if a philosophical analysis of this relation is possible, necessary and fruitful. Is not each of its elements, bios and techne, primarily or exclusively a matter of respective scientific disciplines, biology and other natural and technical sciences? This question is quite legitimate and the answer depends on how philosophy itself is understood. I believe that here, at its birthplace, there is no need to argue about the necessity of a "vision of truth." It is certainly no less important today than in ancient times when Plato in just such a way defined the essence of philosophy.

The basic questions that this relationship evokes and imposes are eminently philosophical, since they refer to the basic characteristics of our epoch and man in it. If philosophy is "its time expressed by thoughts" (Hegel) - and that is all any real philosophy is - it cannot, and must not, be blind to the existing drama of contemporary world, the drama in which man is the main dramatis persona and at the same time the main stake. Paradoxically, it takes place at a time in which man, by his thought, science, skills, organization and means is more powerful than ever before. According to a sort of negative dialectics he is astonished to discover that he is the most vulnerable and endangered, although he gives an impression of being nature's strongest. It is easier for him to control the forces of nature than his own internal forces, which break away from his hands like the broom from the sorcerer's apprentice. That is why this age of uncertainty should be the age of philosophy, which, like Minerva's owl of wisdom, gets out at twilight. According to many authors, one of the basic elements of the contemporary crisis is the difficulty in keeping control over the forces created by man himself, to prevent them from becoming masters instead of servants. Hence, as Yugoslav author H. Burger put it, just "thinking about technology -- its sources, suppositions, gist, and future -- we come not only to the very roots of the epoch in which we live, but also to the very sources of philosophy."

What can philosophy do, confronted with the hard and obstinate facts of life and hasty, self-perpetuating forces of technology? "In front of a universal rise in technology and its triumphant organization, one could wonder whether the philosophical curiosity became powerless, inadequate, and simply pretentious?" (Serruys).

The answers to these questions are various, ranging from complete denial to optimistic exaggeration of the importance of philosophy's role. The right answer might be: it depends how deeply philosophy penetrates, how brightly it illuminates its time, and how widely it is accepted as a consciousness and self-consciousness of its epoch. In any case, philosophy cannot impose any objectives on society, let alone carry them out. The whole history, from Plato to Campanella, Bacon and Comte, has shown that all suggestions and attempts to organize society according to philosophers' designs, including philosophers as leaders, failed without having been put into practice. One could say, paraphrasing Pascal, that "society has its own reasons that reason does not recognize." But philosophy can, as B. Russell said, free us from "the tyranny of

prejudice and from the distortions due to a narrow view," and be of help "in man's collective work of bringing light into a world of darkness." Man has to persist in his search to find answers to Kant's three questions:

- What can I comprehend?
- What may I expect?
- What should I do?

As long as he asks such essential questions of himself and his world, man finds himself in the domain of philosophy, although perhaps, like Moliere's Mr. Jourdain, he is unaware of it. And this makes him a man. In addition to being zoon politikon and a tool-making animal, he is also animal philosophans, i.e., the only animal capable of, and condemned to, trying to fathom his own sense and essence. This is at once his privilege and his malediction, making him an eternal exile, malcontent, and wonderer. That is probably why Hegel used to say that he was condemned by God to be a philosopher. Not only is it, according to an old Latin dictum, *difficile non philosophari*, but it seems that *impossible non philosophari est*.

How shall we explain such a lively interest in contemporary philosophy of technology, for a subject which is, at first glance, by its inherent rationality and practicability, so distant and strange? Perhaps because technology "imposed" itself, "jumped", so to say, into the philosophical sphere of interest, and became unavoidable. This is certainly because technology imposed itself upon man, thus making the whole human problematic in a great measure, if not completely, technological.

One could say that it has always been like that, to a certain extent, since the beginning of philosophy. Let us recall, for instance, that in works of ancient Greek philosophers, Georgia, Hippias, Plato, and Aristotle, we can find some reflections on *techne*. In contrast to the theoretical knowledge *episteme*, it meant skills, broadly and polysemantically understood, both productive and unproductive, enabling man to reach objectives defined in advance. It is important to notice that *techne*, comprising also some sciences and arts, for instance, in Hippias' classification of seven *techne*, was linked to man and his natural predispositions forcing him, unlike animals, to use *techne* - skill, knowledge, tools and cunning - in order to survive. Or, as Georgia put it, to struggle against chance *tyche*. In doing so, Plato and Aristotle, limited by their epoch, considered productive labor to be a matter of slaves and lower classes of citizens, while other *techne* and philosophy were reserved for free citizens. This would be classified later, by Cicero, in Roman culture as *artes liberales* and *artes sordidae* and maintained in centuries to come as a distinction between fine arts, *les beaux arts*, and mechanical arts/mechanical skills. The term *technica*, *technics*, *technik*, *la technique* in its modern, narrower meaning, came into being only in the middle of the 17th century in Germany and in the 18th century in France (Burger).

Cicero's contemporary, Lucretius Carus, in his philosophical poem *De rerum natura*, describes the evolution of man. Using, in the beginning, only his own natural organs -- hands, legs, teeth, fingernails -- and objects found in his surroundings -- stones and branches -- to satisfy necessities of life, man gradually acquires more efficient means of production, enabling him to "clear the path of progress." But Carus does not ignore the evil social consequences of man's technological capabilities -- envy, greed, fetishism, conflicts and wars. It should be noted, however, that Carus' critique, as well as some other critiques of technology, dealt only with its negative social and political, and not environmental, effects. This is understandable keeping in mind the low level of technology during that time which imitated, *natura imitatur*, rather than endangered nature.

Medieval thought was primarily occupied with unearthly, spiritual, and religious matters, instead of rational/practical, or scientific/technological matters. It put forward the role of the Divine, not of the human: nature and man are created by God and governed by his will. True enough, compared to other living creatures, man has a somewhat privileged place, since the Bible takes nature as his Dominion given to him "to replenish the Earth and subdue it" although he is condemned "to earn a living by the sweat of his brow" and may expect the salvation, if deserved, only in the world beyond, the refund paradise.

Any research, thought, or action raising doubts or denying the ruling religious dogmae, were condemned, persecuted, and punished. For instance, Saint Augustine warned of "the danger of those skills and science which are motivated by curiosity, because they draw attention to the outward and prevent from reaching the divine origin of being and things."

It is only with the beginning of the modern era -- the 16th and 17th centuries -- that the role of scientific, critical thinking, and the development of man's intellectual and technological capabilities, came again to the forefront. In this respect, Francis Bacon was a pioneer. In his works *Novum Organum Scientiarum* and *Nova Atlantis*, which contradicted the prevailing scholastics, he laid a foundation for a great renewal *instauratio magna* of science based on true induction and experience, and free from any prejudice *idola*. He also stressed the importance of practical, not to say utilitarian, orientation of science, the great influence of scientific and technological discoveries upon the development of society, and expressed his confidence in an unlimited and irresistible progress of science and technology and their beneficial influence on human welfare and happiness.

This optimistic orientation estimating the possibilities of the developing role of science and technology, was boldly announced by G. Bruno and continued by many other scientists and philosophers -- Galileo, Copernicus, Kepler, Descartes, Spinoza, Newton, and Leibniz -- and, in the 18th century, the French philosophers of Enlightenment -- Diderot, D'Alembert, Turgot, Condillac, Condorcet, La Mettrie, Helvetius, and

Holbach.

Advocating an essentially simplified, mechanistic and deterministic concept of nature, they confidently expressed the increased power of man -- man who treats nature as a mere object of his rational, scientific thinking and his technological actions, aimed at exploiting and subduing nature. Doing so, both nature as an object, and human capability to understand and exploit it, are considered unlimited. In spite of later attempts to bridge this gap between man and nature, either in an idealistic (Schelling, Hegel) or dialectical/materialistic manner (Marx, Engels), such a paradigm has been maintained through today, in thought and even more in practice. So, nature, living and non-living, is considered an absolutely submissive, inexhaustible, obedient object, mere raw material, a servant. Man, on the other hand, as an absolute master, self-confident and conceited, of the unlimited power of science and technology and its application.

Confidence in the omnipotence of science and technology becomes a sort of fetishism of technology, a kind of ideology/technicism, even of theology. A cult of technology has created a blind belief that technology can do anything and everything. All problems, including all kinds of human relations -- production, entertainment, art, politics, success, even love -- can be reduced to technological ones and solved as such. Every technological problem is, by definition, solvable. Pleading for technocracy, i.e. the rule of engineers and scientists instead of politicians, began in the United States, to constitute a particular social movement during the 1930s. J. Burnham identifies and supports the "managerial revolution" where experts, administrators, and managers put public affairs under their control. J.J. Servan-Schreiber predicts that the informatization of society will bring happiness to mankind. R. Rihta et al. states in *Civilization at the Crossroads* that the development of productive forces will automatically lead to a communist society. Such belief in a kind of positive "technological determinism" seems to have been shared by socialist countries who stressed the economic and technological development largely conceived in a purely quantitative sense -- more electricity, steel, tractors -- neglecting other aspects of the development of society and individuals. Such opinions have also been expressed in the opposite camp -- among the representatives of bourgeois society. For instance, the former president of the American Council of National Industrial Conference, V. Jordan, was of the opinion that technological progress will have as a consequence the disappearance of money and property and the introduction of collective distribution. A similar stand was expressed by the American National Association of Manufacturers in its address "Calling All Jobs" in 1954. It underlines its conviction that the advanced industrial society is at the threshold of a golden future and that automation is the magic key to construction, and not a blind instrument of destruction. Together with atomic energy and electronics, it quickly leads to "undreamt, distant horizons." An analogous optimistic view was expressed by L. Kelso and M. Adler in their *Capitalist Manifesto* (1958). They stated that the rapid technological development is usually considered a prerequisite for overcoming the class division of capitalist societies, transforming capitalism into middle class society, as well as for the building of a welfare state.

The above-mentioned optimistic paradigm of the relation between man/ technology/nature could have been valid in those times when the middle element of the paradigm, technology, was at its very lowest level, its development extremely slow, almost non-existent. Even if damages occurred -- as in the deforestation and defertilization in North Africa and Mesopotamia -- they were not global and catastrophic. However, with the rapid progress of technology, constantly and systematically backed by science, it was increasingly evident that this progress created new and difficult problems in various spheres. This explains warnings about, critiques of, resistance to, and even rejection of, technology.

As already mentioned, some of these "dark sides" of the technological application and development were criticized by some of the ancient thinkers -- Plato, Carus, Seneca -- in times when "technicity" was rudimentary. From time to time in later centuries there were such critiques -- for instance, Campanella warned about the danger of using technology contrary to the principles of humanism. But it was only with the first industrial revolution that they became more numerous, with some assuming the guise of social movements. For example, the so-called "Ludist" movement in England at the end of the 18th century, which did not treat machines as "iron servants" or "non-living slaves" but, as their worst enemies who should be destroyed. Similar behavior can be found today, such as workers' resistance to the introduction of new technology which can lead to unemployment.

The influence of contemporary technology is many-sided and radical. In some cases, critiques of technology deal only with specific aspects of technology in some cases, in others, with technology as a whole. There are authors who believe that it is possible to reconcile the ever-growing presence of technology with nature, man and his society. Others, more radical, exclude such a possibility explicitly or implicitly. These controversies still exist, and it is up to this conference to try to indicate solutions.

Bourgeois philosophical and economic thought in the late 18th and early 19th centuries drew attention to contradictions between scientific and technological progress on the one hand, and cultural, ethical and social conditions on the other. J. J. Rousseau pointed out the disastrous disharmony between the progress of science, technology, and civilization based on private property, and happiness of man, and called for the "return to nature", that is, to the creation of a free, democratically-organized civil society which could preserve genuine humanity, harmony of life, and the natural happiness of every man.

Hegel stated that man, using means of production in the work process, "uses nature against nature itself." In addition, he drew the conclusion that "the more man conquers nature, the more he enslaves it, [and] the more he humiliates himself." Using machines in this process, man separates his work from nature, and behaves not as a living creature but instead, becomes machine-like. Thus, in industrial society, "everybody uses all others, competes with all others, reigns a horrifying misery." His general conclusion is that the progress of the human mind does not necessarily mean the progress of human happiness.

English classical political economists, D. Ricardo and A. Smith, noticed harmful social consequences, especially for the working class, of the increasing use of machinery in industrial production. At the same time, utopian socialists St. Simon, Fourier, and Owen, along with critiques of the capitalist society, offered their ideas on establishing a society of social harmony.

Marx and Engel considered technology as an essential part of human productive forces and praxis, the development of which influenced the changes in the whole social structure. Their critique of capitalist society was not based on the widespread use of technology in industrial production as such, but rather, on the capitalist social conditions in which technology was used -- capitalist private property, exploitation of the working class, alienation of man, etc.. They believed in endless growth of science, technology, and production as the necessary prerequisites for a rich, classless communist society in which would be achieved the reconciliation of man with nature and man with society. The obstacles to such growth were not, in their view, natural, physical, and ecological factors, but inadequate social relations, primarily those founded on capitalist private property. Thus, a revolutionary abolishment of those relations would clear the way for unhampered, harmonious, and unlimited development of productive forces and of each individual. That is why Marxist critique of technology, according to Yugoslav author H. Burger, "accentuates only the social source of destructive nature of productive forces, but not the inherent ontological destructiveness of technology." It did not recognize the "principled destructive entropical nature of technological-working process." It was, perhaps, too early to realize this second side of technology.

Indeed, it could be said that this second "principled" or "ontological" side of the destructiveness of technology has only recently come to the forefront, become a matter of serious concern and an explicit object of criticism. Wide public opinion in many countries -- as seen in "green" and similar ecological movements -- stood against the misuse of modern technology, especially its most dangerous forms and entropical consequences: nuclear energy; air, water, earth, and food pollution; exhaustion of limited and non-renewable sources of energy such as minerals and metals. Moreover, the ever-spreading consciousness that ecological problems transcend state, ideological or other boundaries has spurred international actions on global, international and regional levels. This action has come from governmental and institutional bodies such as United Nations Environmental Programme (UNEP), and from non-governmental, "grassroot" or alternative organizations.

A general, a priori negative attitude which views technology as an evil in itself, has been expressed by many thinkers, sometimes in metaphorical terms within the framework of their pessimistic and nihilistic visions of man and civilization. For instance, O. Spengler sees in the dominance of rationalism and technology, one of the causes of decline and destruction of cultures, and sees machines as "a product of devil." To W. Ogburn, the machine is "a dictator which governs our lives," and for L. Mumford it is "a fetish ... [a] real God [to whom now belong] empire, power and glory." With the advent of electronic computers, he saw the appearance of "a new object for cult: God of cybernetics." Similarly, Frenchman L. Ellul considers that machines "took [the] place of fallen Gods," and technology became "a universal legislator." N. Berdjaiev pointed out the destructive power of rationalism in contemporary civilization, dominance of technology -- "the original sin of culture," and the machine itself, which acquired "a magic power over man." He considered dehumanized man guilty, not the machine. R. Schrader believed that science and technology are more and more becoming our masters, not our slaves; Thoreau, that men have become the tools of their tools. For B. Russell, machines are "hideous, and loathed because they impose slavery." Even a century ago, G. Moore was of the opinion that "the world is dying of machinery ... it is the great disease ... the plague that will sweep away and destroy civilization; man will have to rise against it sooner or later."

Critiques of science and technology's exaggerated rationalism and impoverishing instrumentalism -- in contrast to the fullness and totality of life carried out by Elan vital (Bergson), or Will to power (Nietzsche), can be found in works of the proponents of philosophy of life, or lebensphilosophie, such as F. Nietzsche, W. Dilthey, and H. Bergson. Closer to our time and broader in its grasp of the problems of technology, is the so-called critical theory of the philosophers of the Frankfurt circle; H. Marcuse, T. Adorno, J. Habermas, and others. Examining the interrelationship between the individual, society, and nature, in light of contemporary technological civilization, they point to arising problems: the repressive character of a highly-developed industrial society which manage to dominate and manipulate the individual, making him impoverished and one-dimensional, diminishing the scope of his liberty; the partialization of social conscience; the irrationality of society despite the high level of its technological rationality; the use of technology and the constant elevation of the standard of living, rather than terror, to secure the cohesiveness of social forces; the enslavement of the worker by transforming him into mere existence -- "reification"; the fact that the more technology empowers man to rule over nature, the more he conquers other men; the constant menace of war and the ensuing dehumanization and wastefulness.

Similar critiques of the negative effects of technology on contemporary society can be found in the works of many authors and quoted in great number -- they are commonplace in discussions on technology, contemporary man, and civilization. One such analysis, nearly summarizing all others, was recently published by Gunter Anders. The book's title itself, *The Obsolescence of Man*, underlines the author's main thesis: in the epoch of the third technological revolution, symbolized by the use of atomic energy, man has become obsolete. He is no more a subject of history. Replaced by technology, he is only "co-historical." The world has entered the stage of technocracy, a "permanent and irrevocable" situation. Instead of being homo faver, man has become homo creator, i.e. creator of new things and creatures non-existent in nature, but also homo materia, a mere object -- raw material like nature itself. The development of science and technology, especially automation, makes him superfluous -- and as such, he is deprived of his very essence. The worker's labor, deprived of telos and effort, reduced to imitatio instrumenti, becomes a mere addition to the machine, the phenomenon of "Chaplinitis." This is so, according to Anders, regardless of the character of property, means of production, and type of society: dehumanization is a consequence of technology qua technology and is irreversible. There is no good or bad use of technology; every technology is bad in itself. Nevertheless, Anders believes the absence of technology in

underdeveloped countries is more dangerous than its existence, which is in obvious contradiction to his general negative stand.

According to Anders, the true revolution of our time is the technological one. It establishes "the dictatorship of technology" and "totalitarianism of devices," inevitably bringing about the convergence of opposite political and ideological systems. After all, ideology itself -- like privacy, dying, reality, liberty, history, fantasy, space, time, sense etc. -- is obsolete in the artificial world of devices.

At the foundation of Anders' stand towards technology, lies his extremely pessimistic anthropological view of man as a being who, "in principle, cannot be sane and does not want to be a sane being," who is, therefore, an "unhistorical being." Hence the final nihilistic conclusion about the nonsense of life, even of the universe as a whole. He believes the root of this nonsense is technology.

In that way Anders has closed up "the technological circle of nonsense" without searching for any way out of it. Even if we do not agree with his extremely pessimistic conclusions and cannot overlook the contradictions in his work -- including the fact that his analysis is based on features a small part of our highly-developed world -- we cannot deny that his analysis contains many lucid, although not always pleasant, observations. Is there any way for man to get out of this circle of reification and nonsense in which he has been driven by his own deeds, or is the matter hopeless? Answers differ and here we will cover only a few of the most common. The fact that Anders and other nihilists report to their fellow men their discovery of general nonsense and absolute nihilism, contradicts their principled nihilistic stand: absolute nihilism is incompatible with the need to report to others, let alone attempt to persuade them. True nihilism is sufficient unto itself -- silent, unknown, and dead.

Without overlooking the "dark sides" of technology, in fact often insisting upon them, the majority of authors nevertheless see some hope for man, if not in completely eliminating the negative effects of technological activities, at least, in lessening them to a supportable degree. The proposed solutions are very different and sometimes contradictory. They reflect differences in the perception of the very nature of the problem, and go from technology itself to the highest spheres of religion, ethics and spiritual life. Let us look at some, without entering into a detailed analysis, and leaving aside the thorny problem of their feasibility and practicability.

Perhaps the most widespread conviction -- almost universal, although not always explicit -- is the conviction that problems caused by science and technology can be solved by science and technology. This assumption is deeply rooted in the prevailing scientific-rationalistic paradigm of thinking to which we all are accustomed and which often acquires characteristics of an uncritical, blind belief, if not to say cult. This is the simplest and easiest "solution" -- one remains in the same technological field, that is to say, technology-provoked damages being repaired by using technology-based procedures or devices, or, better yet, by inventing and introducing new "ecological" technology. There is little or no need for change in other spheres of human life, values, or behavior.

Some proposals move away from this purely technological terrain and take into account social, and in particular, economic consequences of the unrestrained use of technology. They look for the solution in limiting or stopping economic growth in order to preserve the shaken equilibrium between economic/technological and population growth, and the finite space and resources for human life -- so-called "sustainable development." This was the position of the first report of the Club of Rome. Similar conclusions were drawn in their second report and by the recent report of the World Commission on Environment and Development, Brundtland Commission.

Some other proposals, mainly but not necessarily of Marxist inspiration, see the problem of technology closely and inseparably linked with the whole social structure, modes of production, exchange and distribution, type of property, motivation for economic activities, nature of political system and decision-making, etc.. Consequently, they see social change as a necessary prerequisite for the reconciliation of man and technology. For them, the problem of technology is essentially a social and political problem, and must be treated as such. Views differ as to the direction, scope and nature these changes should take, but all stress the need for change. In this type of reasoning, technology is considered a neutral category whose beneficial employment depends on the society which employs it. Should technology be employed badly, the blame is not on technology itself, but on the way of and the purpose for its employment. The most ambitious proposals of this kind call for radical and revolutionary changes to society, the abolishment of class society, private property and profit. Other proposals believe partial change in some sphere of societal structure or functioning would suffice, e.g. the humanization of work advocated by G. Friedmann, or the establishment of human relations advocated by J. Knox -- some form of worker participation in decision-making and/or property of enterprises, etc..

One should remember the two opposing political answers to technological challenges: the first one pleads for a totalitarian type of political organization, with a strong state apparatus, headed by Burnhamian-type managers; the second, in contrast, intercedes in favor of democratic organization of society and political life, believing the concern, participation, and responsibility of all citizens, to be the best solution.

It should be added here that the ever-growing internationalization of problems caused by technology can and should be dealt with only by common effort and action organized at the international, or global, level. The most ambitious proposals of this kind advocate the creation of some sort of world federation or world government, either by appropriate transformation of the existing institutions, e.g. the United Nations, or by the establishment of new ones. These ideas, advocated by such authors as A. Einstein, B. Russell, A. Toynbee, L. Mumford, E. Reves, are also expressed in programs and activities of certain trans-national non-governmental movements and organizations such as the World federalists. On the other hand, some attempts "to get out of the technological trap" take the shape of individual or group refusal to use certain technological devices. Other attempts involve departure from the highly-developed technological civilization to a sort of voluntary self-

isolation or self-marginalization. Some of these attempts are old, as with certain religious sects such as the Amish, but some others are quite new -- "hippy" and similar communities -- individuals escaping urban areas to return to rural life.

Some authors place the problem of technology at the level of consciousness and ethical values. They see the solution, primarily or exclusively, in better education of the public, in changing moral norms and creating a new, ecological and humanistic consciousness -- a new sense of common destiny and responsibility. The accent is, therefore, on the individual and his conscience, on bringing about "a revolutionary change of heart in individual human beings" (Toynbee), what Buddhist philosopher, Daisaku Ikeda, calls "the spiritual revolution."

Some thinkers, not necessarily theologians, consider religion a necessary base for man in his dealings with science and technology. Ikeda believes that "religion must take a leading role in scientific-technological civilization" and is, in fact, "the only hope for continued scientific development and the cessation of manmade disasters." Sharing this opinion, A. Toynbee underlines that religion is "the only faculty of human nature that is capable of inspiring human beings to master themselves, either individually or collectively." He adds, "The greater man's power, the greater his need for religion. If the application of science is not inspired and directed by religion, science will be applied to the indulgence of greed, and will serve greed so effectively that it will be destructive." Both Ikeda and Toynbee believe in the need for "worldwide cooperation among adherents of all religions and philosophies."

A similar stand has been taken by the Polish philosopher, Henryk Skolimowski, who advocates the fusion of Christianity, Marxism and Ecology, the latter transcending the former two. In this fusion, he thinks ecology would be enriched by the spiritual heritage of Christianity, and Christianity and Marxism would be enriched by "ecology's total vision of the interconnectedness of all things and the understanding of the uniqueness of all forms of life, their inherent worth in this cosmos, independently of their use to us." Skolimowski stresses the need for new, ecological thinking -- wholistic, reverential and participatory, as opposed to scientific, uncaring and objective -- and a new conception of ecological man, totally unlike the Faustian model of man as a sceptical, cynical, lonely, alienated and frustrated being.

The above opinions and proposals do not exhaust the entirety of philosophical, socio-political, and psychological thinking on technology's impact on man. Rather, they indicate the main directions in which solutions are heading, and illustrate the existing differences and controversies. However, there are many eclectic positions which combine these ideas in new and various ways and accentuate different elements. For instance, two American authors, L. Milbrath and F. Inscho, see a necessary five-fold change:

- social change must be a central concern if we are to live in harmony with our environment;
- many closely-held individual beliefs and values must change, as they are the central component of social change;
- government must play a major role in planning and implementing needed changes;
- traditional economic thinking and economic relationships may well be upset;
- people will have to make some very difficult policy trade-offs.

It seems that in this kind of pluralistic approach -- parallel and interconnected actions/changes, objective and subjective, social and individual, material and spiritual, governmental and non-governmental, organized and spontaneous, scientific, technological, rational and ethical -- emotional spheres must be envisaged, elaborated and promoted. All these efforts must be commensurate with the enormity of the stake involved, namely, the fate of humankind, and tenaciously pursued on both national and international levels. These efforts must be multi-dimensional, as the impact of technology itself is multi-dimensional. The worst solution would be to leave things as they are, run by the blind, suicidal, genocidal, inertia of a narrow view, greed, selfishness, and carelessness, and an "after me" deluge illogic. Unfortunately, we are just beginning to change our ecological thinking and behavior. Worse, it is not certain that necessary changes will occur at all. Yet, tempus fugit.

Both exaggerated glorification and deification of technology as a panacea for achieving a new "Golden Age," and a priori and total condemnation and rejection of technology as evil per se, should be considered inappropriate. Equally dangerous are an irrelevant, reckless optimism, and hopeless, nihilistic acceptance of the coming of "the world night" -- either as a "nuclear winter" or total robotization, dehumanization and ecological catastrophe. Man, Pascal's roseau pensant, at once both fragile and powerful, is capable of both, for his destiny is in his own hands. Will the flickering flame of bios be preserved and strengthened, or will it, and everything with it, disappear into nothing?

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