

ON TECHNOETHICS

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1. Presentation

Recently, many instances in the world culture are pushing towards the rediscovery of the ethical dimension of technology. It is of paramount importance now to foster a debate, similar to what is being done in the area of bioethics, aimed at the formulation of a series of common principles that would serve as a basis for what could be called Technoethics (TE). Without pretensions to completeness or systematicity, this brief treatise wishes to propose basic elements fundamental to the debate in question.

2. Definition

TE could be defined as a sum total of ideas that bring into evidence a system of ethical reference that justifies that profound dimension of technology as a central element in the attainment of a "finalized" perfection of man. This definition presupposes a positive view of technology as anthropologically relevant, which notwithstanding it being one of the first truths known to mankind, has been strongly questioned within many sectors of culture in these last decades.

For this reason, distinction should first be made between TE and what is generally known as the professional code of ethics of the engineer. This important subject specifically concerns the free and responsible action of these professionals in so far as it forms part of the whole of human activity through the tasks proper to the profession. Though TE has to do primarily with the activities of the engineer, its scope should be considered as more ample, arriving at illuminating all technical activity in so far as this can result in a positive end for the person and technics itself with respect to the objective value of its products.

TE cannot be identified with the ethics of the technological society that is in its own respects, a broad concept including non-technical aspects of human action even though it holds a central position in technology in the central framework of civilization and the definition of behavioral models of man.

In this sense, there is need to affirm that TE, though without any pretensions of totality, should become an important and indispensable element together with others toward making possible a real development of man in the proximate future.

3. Prometheus: *homo technicus*

To hold that this issue has not been present in the recent history of civilization may seem paradoxal, considering the fact that mankind cannot do away with the technical dimension, going even to the point of considering this part of its constitution: mankind is technical by nature. Technology is not an addition to man but is, in fact, one of the ways in which mankind distinguishes itself from animals. Two very clear examples illustrate this fact in the ambit of western culture: according to the myth of Prometheus, animals are provided with *natural tools* in order to survive, but the human person is born devoid of these: he or she alone has the capacity of producing *artificial tools*; according to the book of Genesis also, Adam was meant to plant the garden of Eden and work in it in order to reap its fruits and to improve the garden. In both examples, an "unfinished condition of mankind" is emphasized, so that human beings are forced to interact with material cosmos in order to produce technology: *homo technicus*. This interaction, guided by reason, can be

generically called "work". This is a clear difference between an animal and a man. Man consciously proposes finality to his or her work. Man uses a rational approach while animals act and produce on the basis of instinct, which is inherent in nature.

4. Causes of the problematic ideas regarding technology: the paradigm of dominion.

Earlier on, we said that this anthropological positivism on technics has been questioned in recent culture that based on different philosophical stimuli, largely remains contrary to it. It is a paradoxal question: on the one hand, the modern man depends heavily on technology; on the other, he tends to believe that technology is anti-human, a reality against which he ought to defend himself. The proposal of TE is aimed at overcoming this paradox.

Notwithstanding some skirmishes here and there, I believe one can now consider the battle against technology as being definitively lost by all its enemies. Strong forces have been involved in the effort to marginalize the emerging technology: one just has to think about philosophers like Heidegger or Husserl, movements such as the Hippy culture or, more recently and with different overtones, the New Age: abundant and fundamental products of the culture and art of the XX century, they have fought in the ranks of the anti-technological army. But technology has won from within. If little by little, the motor, electricity, telephone, have introduced themselves into the everyday life of man to the extent that no notice is taken anymore of them excepting when they are lacking, one can add that in the last years, the process has only accelerated and everything has been invaded by technology: even the most fundamental mechanisms of the production of life have fallen under its dominion. But is it a true dominion? Many would readily answer this question affirmatively. In my opinion, this answer depends only on a cultural paradigm that is not that of the predominant technology but that of scientific positivism typical of the XX century.

We are certainly faced with an epochal change, even if this change is in fact, in continuity with a development that never let up its progress starting from when man first invented fire and the wheel. The question that presents itself is that of the new rapport between man and the machine. Even though there are, and will be notable changes in the categorical dimensions of this rapport, in my opinion, its substance will not change. It is altogether another issue that man, always free and responsible for his actions, can conduct this relation in a wrong way or that new circumstances can make it difficult. Affirming the dominion of the machine over man in literature and in contemporary cinematography does not seem to have any purpose other than that of presenting man with the question of his proper identity so as to seek, in a more or less banal manner, a way out of the dead end to which the civilization of exasperated scientism has brought him.

For those persons, for whom the profound sense of the person is lacking and is reduced merely to its functions, the temptation of substituting this with a machine is strong: at the functional level, the machine is less disappointing than a man. Such an idea of the human person is typical of modern scientism, characterized by an exclusively objective vision of reality and dependent on an immanentism, predominant in most aspects of modern philosophy. United with this is an autonomous vision of man within the cosmos that leads to a profanation of the relationship between man and reality, of which any fundamental dimension whatsoever ought to remain interior to the man himself. Thus, the sole possible rapport of man with the cosmos is reduced to his dominion over it through knowledge of its physical laws. Obviously, this dominion is oriented towards technics seen, however, in a purely instrumental dimension. Speaking from a theological perspective, one can say that a substitution of God (fundament) takes place with science; of religion with technics (Scheffczyk). For this, even with the risk of creating more terminological confusion than conceptual clarity, the science of the XX century can be suitably called "techno-science". Techno-science is mother of an antihuman technology.

5. The concealment and the rediscovery of the person

If the concept of nature is understood only within the ambits of techno-science, the temptation to reduce man also to this sphere can hardly be avoided, equally reducing liberty to the determination of physics. Given the manifest impossibility of this reduction, effort is made in a second moment, to place man completely outside the sphere of nature and its rules: the activities of the human spirit are not considered within the confines of any law, and it is very difficult if not impossible to found an order of ethical reference.

This provokes a radical sense of distrust towards the person that cannot be brought under the dominion of the laws of empirical science and is, above all, hardly reliable. The pretension of the scientific paradigm of

dominion will be that of the absolutization of technology seen as the only redeeming solution in the face of the awareness of the imperfection of mankind: the person is auto-marginalized. One aims at a cultural system of the sacralization of immanence such that, not being able to justify mans imperfection, he pretends to reduce history to a process in which man is progressively taken less into consideration. This is done in such a way as to avoid the immeasurable and unpredictable risk factor coming from the person. Many prophets of the crises of modernity like Nietzsche or Dostoevski, had announced that mankind was going in a direction where there would be no place for liberty. As the Great Inquisitor stressed, liberty is really the last thing man wants.

The crisis of the paradigm of dominion has been clear for a long time as well as its radical internal contradiction. One cannot for long fall victim to the deception of affirming mans future as solely a question of mere technological progress. The idea of progress considered in itself is finalistically undetermined and empty, it converts man into an untiring ant, into a Sisyphus of Camus. One cannot arrive at the fullness of the human only by extending time.

The time of man cannot entirely be understood, in modern terms, as a body of functions proper to the human being: in this sense, life itself acts as a witness of the opening-up to a transcendental and superior dimension, the only one fit to give a definitive sense to the flow of human existence to the point of affirming that in certain cases, it would be worthwhile making a gift of ones own life. In fact, the figure of a "useful" death is a radical manifestation of the personal realization of the gift that can also be made in every instant of vital existence.

Besides, this paradigm has also lost credit for motives of a practical nature: problems that techno-science has created (ecological crises, unfair distribution of goods of the planet, violence...) seem sufficient to raise doubts as to the usefulness of maintaining its advantages. They should obviously be maintained: it would be a pity to give up veritable conquests of the human spirit. But something has to change. TE proposes that what should be changed is, properly speaking, the vision of man on himself and his vision on reality. Here originates the deepest motives for the failure of the techno-scientific paradigm that respects neither the nature of man nor the nature of beings in general. There is need to abandon techno-science that includes the primacy of science over technics and to welcome a new relational paradigm that is gaining ground in post modernity. TE is born of the demand to stop a tendency, inherent to a large part of technics, towards separating itself from freedom so as to affirm technology instead as a spiritual activity, an eminent product of the spirit of man.

6. Rediscovery of the true sense of technics: paradigm of interwoven relations

The techno-scientific paradigm of dominion has been unable to respond to or render incomprehensible the eternal questions of man that manifest his transcendence over all measurable reality: sorrow, death and sense of guilt. These three enigmas clearly show that the being of man cannot possibly be reduced to the mode of being of the universe. If the post-modern man does not decide to abandon his dominant cultural presuppositions, he will find himself constrained to choose between the desperate search of a system of immanent redemption (post-modern neo-gnosticism, often with a strong techno-dominant content), or give up definitively on any answer whatsoever to the radical questions of being and of history (*pensiero debole*). Faith in an auto-redemption has been substituted by the certainty that the intra-human instances would never be able to furnish a definitive answer to the ultimate questions of man.

In culture already, there exists the widespread conviction that a solely scientific rationality, with its objective dominion over reality, cannot arrive at the truth behind reality. The truth cannot be confined to universal and absolute affirmations. Knowledge is not dominion, but participation in reality, empathical condivision. We are conscious of not being able to continue with a form of knowledge that is objectivising and not compromising: our knowledge of reality has to be rivested with an open attitude, capable of entering into relations with it. On our journey into the Third Millennium, we could not possibly advance only by means of sole reason: we are in need of an "accompanied" reason. Such awareness would seem to constitute one of the few common grounds of mankind at this turn of the century. Different positions coincide in a change of view on transcendence: whilst in the period of modernity transcendence was understood as none other than the ambit of objectivising dominion starting immediately from all that is not the "I", now it turns out indispensable to establish relational ties with it. It has recently been said that the clearest symptom permitting the differential diagnosis between modernity and post modernity is to be found in the type of relationship that there exists between immanence and transcendence: it is this relationship that has changed. In fact, the

growing influence of the concept -"accompanied" reason - persuades one to go out of self so as to meet the other, laying the foundations of companionship. This necessity of transcendence is, in fact, a rediscovery of the metaphysical question: it is to this instance that one should turn in order to ascertain with certainty that what I consider as transcendent to me, may be also destination of my being in newness of life. In other words, there is need to discover the referential nexus with transcendence that permits the interpretation of the "I" and the "not - I" as relational entities. Based on the solidity of this relational nexus, one can justify donative autorealisation as being worthwhile.

In the rediscovery of this relational nature, already pointed out by Aristotle as the fundamental teleological structure of man, is to be found the key to happiness and to the realization of the human person. Given that the dialogical nature presupposes free beings, one can affirm that the future of man can be explained only in terms of freedom. Taking a look once again at the point of departure of the cultural victory of technology, one can conclude that the post modern man, convinced of having to depend on technology in order to attain happiness, must necessarily integrate it into his dialogical structure, transforming it into a vehicle of his donative condition.

The new paradigm, therefore, involves the call to the opening of ones being that realizes itself in dialogue and a strong hand is lent it, in this radical duty, by technological developments that are founded on the same principle. More so than ever, man finds himself immersed in a technological ambience that demands of him a total connectivity (web technology) to which he feels himself called by his own proper dialogical nature. Man, who is conscious of realizing himself through interpersonal relations by means of the sharing of intentional objects of the intellect and the will, knows of his duty and capacity to do this not only according to the spiritual dimension of his being but also with respect to the material. His interaction with matter so that this arrives at a full integration into interpersonal dialogue is the ultimate content of technology. In this sense, technology has as its object, the increment of the relational nature of mankind, and as a result, when science becomes technology, it becomes more spiritual. The dominant techno-science that led technology to a subjugated position should be substituted with an authentic science that is open of the authentic truth on man that transcends its ambit but in the service of which it can and should enter in its praxis: *scientia ancilla technologiae*.

7. The anthropological key to the finality of technology

In other words, it is sought to affirm, as Heidegger did with respect to the arts, that technology also can attain the truths of being in a more profound way than science, simply because it is closer to man. In fact, the prometheutic indetermination of the material condition of man corresponds to the dialogic liberty with which the person interacts with matter in order to make it an object of giving. Similar to the Italian Renaissance at the peak of truly scientific knowledge, technology and art seem to fuse together in the memory of their commune semantic origin: the Greek *technè*. Luca Pacioli, mathematician and collaborator of Leonardo da Vinci, coined an expression adopted as the motto of the Renaissance: "Man is the measure of all things". For many, this sentence manifests the autonomous affirmation of man, independently of any transcendent dimension. Reality is exactly the opposite: the expression taken from the work *De Divina Proportione*, means that the human person is the living reflex of the order of the universe created by God and that he thus becomes the point of reference for discovering this order. Man transcends the universe, but the universe and man are not two separate realities: man includes the rest of material reality in his nature as a dialogical being: each and every "object" can present the occasion for meaningful relationship.

Within the search for meaningful relationships with the cosmos, that are never merely objective, but rather inviting the participation of the person and his dialogic being, the special fecundity of the artistic experience is almost evident. In those who enjoy it, it always involves a call external to us, marked by the subjectivity of the artist and is full of a complexity of evocations. Such a call simultaneously involves an opening of the personal being, something not produced by merely objective experiences, and an interior enrichment, consequence of the fact that the same work gives of itself, renders itself present within the observer as proper to him: it is "different but not distant" (Quintas 1991). There occurs a dialogical circularity in which possession of the work of art and possession by it in an apparent paradox, leads to a mutual improvement.

The same happens, and even more, when the artistic experience occurs within the artist himself at the

moment of creativity. True art involves recognizing the nature of the work as proceeding from another, a revelation for the artist, experience of a gift and at the same time produced by his proper technical ability. In the same way as the artist opens up to receive the gift of inspiration, he is able to produce, as proper to him, the work of art that therefore simultaneously belongs and does not belong to him. Or better still: it belongs to him in its quality as a work of art but in another sense it doesn't belong to him: it has been given him.

The paradigm of interwoven relations allows us to appraise technology along the patterns of art. The aesthetical dimension of existence has as its basis the transformation of any interaction of the single person with material reality into interaction with others. The artificial element is seen in its most noble sense - as the product of the free interaction of man with material reality and in so far as it is free, creator of interpersonal dialogue. There is need to rediscover the anthropological positivism of the term "artificial", which is always an expression of freedom: in fact, man himself is an artificial being, in the measure according to which he is capable of "making himself", of "auto-constructing" himself through his own actions, for the good or for the bad; for this reason, the production of artifices, from the technical (machines) to the symbolic (language), has an intrinsic ethical value. The artifice becomes vehicle of the being in the world, of being with others, of being oneself. Technology becomes occasion of interwoven relations: the aesthetic vision redeems it from the danger, at times unduly exasperated, of substituting man, and assumes it in a fully humane condition. The machine itself, the more it improves and the more it disappears behind its function, the more its true finality is made transparent: man.

8. Application to humanoid robots

The importance of the argument in question is of such magnitude that given the little space available in this article, no facile conclusion can be readily drawn. I prefer to leave the issue open and only present, by way of example, a possible application of TE to the topic of humanoid robots. This has been specifically treated in *Italy-Japan 2001 Workshop "Humanoids, A Techno-ontological Approach"* at the Waseda University of Tokyo November, the 21st, 2001, in a special way and from different perspectives in the papers of Paolo Dario ("The Dream of Humanoids in the Homeland of the Innovative Engineers of Renaissance"), Kazuo Tanie ("How Can We Use 'Human Shape' For Humanoid Applications?"), Maria Chiara Carrozza ("Functional Replacement and Humanoids Robotics: the Fusion of Natural and Artificial Hardware"), Vincenzo Tagliasco (From Artificial Body to Artificial Mind"), Masao Kurosaki ("What is so-called Mind in Robot?") and Jose M. Galvan ("Techno-ethics: Acceptability and Social Integration of Artificial Creatures").

There are three categories of machines, depending on the types of technical activities that man can perform, which are: inanimate tools directly or indirectly guided by human intervention; machines that artificially assist organic life; and symbolic machines, as language, that is the artificial device necessary for dialogue between two people. This is the most basic example, but perhaps the most important. A computer is also a symbolic machine, as is a book. They are symbolic tools.

The thesis, thus, is that humanoids are called to be the *perfect symbolic machines*. The aim of technology is not limited to this or that specific need, but it is open to the whole sphere of reality. It may thus be possible to produce a machine not limited by a specific function, but able "to do what man can do".

In fact, every symbolic machine is unlimited in its "species", because, corresponding to the symbolic capacity of humans, it will have an indeterminate range of expression: a book is capable of expressing everything that man can say, a computer can contain any information that man can develop. But while these symbolic machines are limited by the nature of their significant capacity, humanoids will be machines capable of reproducing the complete symbolic spectrum of human beings, including all the aspects of the primordial symbolic device - the human language. Language includes not only oral language, but also body language: the body, in fact, is the primary symbolic instrument of expression that human beings have at their disposal.

The symbolic character of human acts points to the archetypal dimension of which the acts are symbols. Every symbol requires an archetype.

The symbolic capacity of man takes us back to a fundamental concept, which is that of free will. Free will is a condition of man, which transcends time and space. Any activity that cannot be measured in terms of time and space cannot be imitated by a machine because it lacks free will, which forms the basis for the symbolic capacity of man. The symbolic capacity is not in the material condition of the language that a humanoid can reproduce, but specifically in the nexus with the signified archetype (free will) indicated by the symbol.

When I listen to a musical composition played by a humanoid, it is through this material element (time and space) that I am in dialogue with the composer and the engineer. In this case a humanoid is another element in the material realm of the work of art.

An example of an activity that cannot be reduced to space and time coordinates is that of a caress. A caress is not simply a sophisticated movement of a hand accompanied by another sophisticated facial movement. A caress is a way of expressing love, and when the recipient is a human person then the act is not duplicable. A caress cannot be repeated in exactly the same way, and a human being can receive human caresses forever as they are manifestations of love. Even though the movement is mechanically perfect, a humanoid caress will be always repeatable, not ethically correct.

The humanoid then, is the most sophisticated thinking machine able to assist human beings in manifesting themselves, and this is ethically very good, as it supposes a radical increment of human symbolic capacity; humanoids will develop a lot of activities in order to increase the human quality of life and human intersubjectivity. But humanoids can never substitute a specific human action, which has its genesis in free will.

Everything that an anthropoid can perform is an extension of the human brain's capacity to support human relationships. When you look at the Sistine Chapel you come into dialogue with Michelangelo. When you shake the hand of a humanoid you are in contact with its creator, the engineer.

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