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(Electronic or Otherwise)

Vilém Flusser

ABSTRACT

Our species transmits acquired and inherited information from generation to generation. This doubly contradicts nature. The Second Principle of Thermodynamics states that information contained within nature tends to be forgotten. Living organisms contradict that principle by preserving and transmitting genetic information. They constitute a memory in defiance of the entropy of nature. Mendel's biological law states that acquired information cannot be transmitted from organism to organism. Our species contradicts that law by having an elaborate cultural memory, progressively storing acquired information to which successive generations have access. This double negation of nature, although only temporary, constitutes the human condition. Human dignity, which distinguishes us from all other known beings, can be defined as the fact that we have both a genetic and a cultural memory, that we are 'historical beings'. Human dignity will acquire new meaning as electronic memories radically transform our cultural memory. This article considers some aspects of that transformation.

CULTURAL VERSUS GENETIC MEMORY

If memory is defined simply as information storage (a definition open to serious objections), then we find memories all over nature. They float like islands within the general stream toward entropy, islands that preserve information for a time before they dissolve. Hydrogen atoms and galaxies are examples: they constitute negatively entropic epicycles that sit upon the linear entropic tendency of nature. The most impressive example of such negatively entropic epicycles is the biomass that emerged on the surface of our planet a few thousands of millions of years ago, of which we ourselves are protuberances. The biomass consists of tiny drops in which information is encoded within complex molecules being progressively recopied. Errors occur during this process. Most of them are eliminated from the biomass, the genetic memory, by very complex devices. These errors are called 'unfeasible mutations'. A few errors escape those devices, and they constitute what is called 'biological evolution'. Although our optimistic ancestors (those who believed in progress) considered this evolutionary change to be positive because it allowed new information to be created within the biomass, from the point of view of memory it must be considered a serious drawback. It shows that the biomass is not a trustworthy memory: instead of preserving information it 'processes' it. This processing has implications for technical projects. Genetic engineering, which can be defined as the attempt to store acquired information within the biomass, must take into account that all information stored there is subject to errors of transmission. (If genetic engineering were considered an art, and if the artificial organisms it produces were considered works of art, these errors of transmission would be both a limitation and a challenge for artists.)

Cultural memory is shorter than genetic memory, and even less trustworthy. Human dignity does not merit limitless admiration. Most of the information we have acquired has been obliterated from memory; documents have turned into ashes, buildings have fallen into ruin and very probably whole cultures have been forgotten. When people started to build a cultural memory (i.e. when they began to create and maintain sociocultural diversity), they used two types of memory supports, or objects that store information. The first was airwaves in vocalization, the second was stones, bones and other hard objects. (There may have been other memory supports in use, like body gestures, but these will not be considered here.)

Airwaves offer the advantage that air is easily accessible, and that the human organism is equipped with organs that transform airwaves into phonemes. Speaking comes naturally to us, although each individual language must be learned. (This raises the question of the dubious relationship between inherited and acquired information, i.e. which part of the information for walking is inherited and which part acquired.) Airwaves have the disadvantage of being unstable and open to noise; this deforms the information stored there. Information stored within airwaves, oral/aural information, must be recovered quickly by a receiver, stored within a brain and from there transmitted to other receivers. This process of 'oral culture' is subject to numerous errors of noise-disrupted transmission and to errors within the brains of the transmitters. Thus 'oral cultures' are not, strictly speaking, historical ones, since 'history' means an uninterrupted chain.

Hard objects have the advantage of being relatively stable. A stone knife can preserve information about 'how to cut' for tens of thousands of years. Information stored within hard objects creates informed objects that constitute our 'material culture'. The disadvantage is that such informed objects (tools) are used not only as memory supports but also as data banks: the knife not only keeps information on 'how to cut' but also is used for cutting. The use of the tool wears out the information it carries, much like a shoe which loses its shape with wear. This wear creates the problem of waste, which is at the center of ecological problems. Disinformed objects constitute a pernicious type of memory failure. This is why objects that were designed exclusively as memory supports—that is, not also as tools—came into use. Such 'monuments' (e.g. the Venuses of Willendorf) avoid the problem of waste, although subject to the Second Principle of Thermodynamics, which states that information contained in nature tends to be forgotten.

FROM ORAL TO LITERATE CULTURE

A very ingenious invention was made relatively recently (about 3,500 years ago): the alphabet. It is a code used to

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transcribe the phonemes of spoken language into visual symbols that can be impressed on hard objects. This code united the advantages of oral and material culture. It became possible to create monuments (texts) that stored the information of spoken language within hard objects that could be copied. This recoding proved very powerful. A cultural memory was established, the library, that permitted cumulative storage of acquired information. This was the beginning of recorded history proper. Written language brought about a radical transformation of human thinking and acting. The linear structure of alphabetic writing produced progressive, causal, 'scientific' ways of reasoning and action. The acquisition and storage of information became a disciplined, self-conscious process. The invention of the alphabet may be considered a decisive step toward the humanization of man from anthropoid.

As literate culture slowly emerged from oral and material culture—slowly, because it had to struggle against previous oral (mythical) and material (magic) culture and is still doing so— and as cultural memory became ever more closely identified with the library, a curious process of reification and sacralization of the library developed. The library was not construed as a store of acquired information into which we feed information acquired by ourselves (through writing), and from which we can recover information acquired by others (through reading). Rather, it was considered a superhuman memory that transcends individuals, hovers over them, and to which they must aspire. Thus the role for cultural memory was inverted: instead of serving humanity as storage for acquired information for future generations, it demanded that people serve it. This had a profound effect on all systems of cultural values.

There are two prime examples of this reification and sacralization of the library as literal memory that inspire much of what is called 'Western values'. The first uses the model of Platonic anthropology, which holds man to be an exile from heaven where the external ideas are stored. The library (transhuman memory) is presented as a space (*topos uranikos* 'heavenly place') within which immutable, eternal information is stored according to rules of logic. While, according to Platonic anthropology, this heavenly store is where we originally come from, we have fallen into a world of mere appearances

where all information we acquire is wrong (*doxai* 'opinions'). While falling we have crossed the 'river of oblivion' (*lethe*), but those waters did not obliterate heavenly, true information: they only covered it up, and we must rediscover it (*a-letheia* 'dis-oblivion; discovery of truth'). To know, therefore, is not to acquire new information but rather to remember forgotten eternal information. We can do so thanks to 'theory', which is disciplined contemplation of the heavenly library; if we do so we become immortal.

The second example is Talmudic in nature: the library (transhuman memory) is a meeting place where we can have a dialogue with others. To do this, we have to open ourselves up to each other; we have to recognize ourselves within others and recognize them as our 'others'. We must 'love our neighbors'. The extent to which we recognize our neighbors is the extent to which they will remain in our memory and become eternal within us. The extent to which we ourselves are recognized by our neighbors is the extent to which we shall become immortal within them. Within the transhuman memory, the recognition of otherness, we create the immortality of our 'others'. This recognition is why memory is blessing (*zikhranah lebrakha* 'let memory be a blessing') and why the dead live on (*khayeh hamessim* 'the dead are alive'). To recognize somebody as our other implies the recognition of otherness, of that which is entirely different from us (*JHVH* 'Jehovah'). To love one's neighbor implies love of the Entirely Other. Our neighbor is the only image of God, and through that image we may contemplate God in all possible splendor. Thus the transhuman memory— the library that is the holy script—is in fact God, in whom we meet to become immortal through the love of each other.

These two ideologies, which are at the root of Western civilization, are responsible for our existential identification. We identify ourselves as 'subjects' (underlings) of the transhuman memory and thus as subjects of an objective world. This identification is due to the fact that we reify our ability to store acquired information as if that ability were somehow carried within us, and that we assume this thing within us to be a kind of emanation from the superhuman library that hovers above us. Thus, concepts like 'soul', 'spirit' or even 'ego' acquire an occidental meaning, namely, the part of ourselves that

is not subject to entropy but to eternal information storage. As 'bodies' we are part of the biological world, but as 'spirits' we are opposed to it; we may know it, manipulate it and submit it to our desires.

All the problems of occidental ontology and epistemology, like the relation between body and spirit or the fitting of the 'thinking thing' to the 'extended thing', result from this reification. But there are indications that we are about to overcome this sort of existential identification and cease to adhere to the belief in a transcendental core within us. This change implies a profound revolution in all our categories of thought and action.

INFORMATION IN THE AGE OF ELECTRONIC MEMORY

Electronic memories are simulations, within inanimate objects, of the memory functions of the human brain. (A simulation here means an imitation that exaggerates a few aspects of the original while disregarding all the other aspects. Thus, a lever is a simulation of the arm: it exaggerates its power to lift while disregarding all the other aspects of the arm.) In electronic memories the memory function of the brain is transferred from the skull to the external world. This permits us to watch and to manipulate the storage of acquired information from the outside. What we thus watch and manipulate is a very simplified form of brain memory, which, in some aspects, performs much better than our own cerebral organization. Still, electronic memories provide us with a critical distance from a simulation of our ability to store acquired information; a distance that will permit us, in the long run, to emancipate ourselves from the ideological belief that we are 'spiritual beings', subjects that face an objective world.

The fact that electronic memories exaggerate some of our memory functions and thus these functions perform far better than before will no doubt have profound effects on future civilization. Let me briefly mention a few of these changes. First, electronic memories can be informed more easily than cerebral memories, they store information much longer, and they permit an easy copying of that information. This implies that we need no longer attempt to store this information in our brain— a hopeless endeavor if we consider the amount of information currently avail-

able—and that we can instead feed information to electronic memories. Our brain will thus be freed for other tasks, like processing information. The processing of information is called 'creativity'; we may expect a veritable explosion of human creativity once we have freed ourselves from all the mechanized aspects of thinking.

Another change to be expected is the coupling of electronic memories with robots, whereby information is transcoded into gestures. 'To work' is a gesture that imposes information on an object. For example, a stone knife is the result of an imposition of the information 'how to cut' on a stone. Thus, the gesture of working can be transferred to automated machines. We shall become free to 'program' them, to elaborate the information that will be fed into an electronic memory and then transcoded into an actual gesture. A person will no longer be a worker (*homo faber*) but rather an information processor, a player with information (*homo ludens*).

One more change can be expected. We shall enhance our ability to obliterate information. Electronic memories forget more efficiently than do human memories. The validity of information is limited in time, and that time is becoming ever shorter. (For example, much information concerning the physical sciences that was valid a generation ago is no longer useful.) Our brains are burdened with invalid information; this inhibits us from processing new, valid information. But electronic memories permit a progressive accumulation of information, which will lead to 'historical thought and action' in a new and more radical sense. And, coincidentally, this will show us that forgetting is just as important a function of memory as remembering.

Although these expected changes (and many others that have not been mentioned) are profound, they do not go to the root of the present cultural revolution. The really revolutionary event is the fact that electronic memories provide us with a critical distance with regard to our capacity to acquire, store and transmit information: what used to be called our 'spirit'. Our praxis (manipulations) with electronic memories force us to admit that memory is not a thing but a process, whether that process involves computer hardware or our bodies. This praxis forces us to admit that there is no hard core within each of us which somehow mysteriously governs that process, but that the process of acquiring, storing and transmitting information flows through us and involves not only all of present and past society but also the whole of what we call 'the world'. We are but knots within a universal network of information flux that receive, process and transmit information. Our praxis with electronic memories forces us to admit that what each of us calls 'I' is a knot of relations that, when unraveled, reveals itself to have no hook on which those relations may hang (like the proverbial onion).

This breaking out of the shell of individuality, apparent in our praxis with electronic memories, is not a sudden event; it has been incubating for years in numerous fields of research. For example, analytical psychology suggests that what we call an individual psyche is but the tip of an iceberg of a collective psyche. Ecological studies show that individual organisms must be understood as related functions of an ecosystem. The study of political science indicates that 'individual' and 'society' are abstract terms. There is no individual outside society, and no society without individuals. It is intersubjective relations that are concrete. This relational (topological) vision of our position coincides with the relational vision of the physical world in the physical and biological sciences. Physical objects are seen as knots within relational fields, and living organisms are seen as provisional protuberances from the mass of genetic information.

Husserl's phenomenology is possibly the most adequate articulation of this relational vision. He states, briefly, that what is concrete in the world we live in is relations, and that what we call 'subjects' and 'objects' are abstract extrapolations from these concrete relations.

The ideology of the 'self' has been long to perish. It should have vanished with psychoanalysis, with neurophysiology, and with other results which show that there is no hard core within us. But this ideology remained until artificial intelligences were invented. It can no longer prevail, unless it admits that machines have 'selves'. Our praxis with electronic memories forces the abandonment of the 'self' upon us.

CONCLUSION

It is impossible to foresee all the consequences of such an existential revolution. But this is certain: if we abandon the idea of possessing some identifiable hard core, and if we assume we are imbedded within a relational network, then the classical distinction between 'objective knowledge' and 'subjective experience' will become meaningless. If intersubjectivity becomes the fundamental category of thinking and action, then science will be seen as a kind of art (as an intersubjective fiction), and art will be seen as a kind of science (as an intersubjective source of knowledge).

Humans are different from all other known beings in that they acquire information, store it, process it and transmit it to future generations. This is anti-natural in that it is against the entropy of nature. This unique human ability has been covered up during history by a dense ideological fog that has prevented people from making full use of it. The most pernicious ideology was the one that led us to believe that we have (or are) something opposed to nature. The invention of electronic memories has given us a critical distance from this ability; we may now expect a more conscious use of it. The removal of ideological oppression will not make this ability less mysterious—on the contrary, the mystery of our anti-entropic commitment will deepen.