The Nano-Nightmare

Those who remain as pure humans and refuse to improve themselves will have a serious handicap.

They will constitute a sub-species and be the chimpanzees of the future.

—Kevin Warwick, technophile with multiple subcutaneous chips

As in a game, a macabre game, technology has been pushed to the manipulation of matter on the scale of a nano-meter, i.e., the millionth part of a millimeter. What is manipulated is something that shades off into the boundaries between the non-living and the living: the atom. This technology, called nanotechnology, creates new "products" actually starting from the manipulation of atoms, subatomic particles and molecules. Unlike biotechnology that manipulates the structure of DNA, creating organisms through the recombination of genes, nanotechnology "breaks down" matter transforming it into atoms with the possibility of artificially synthesizing them and thus of creating something material from nothing (atom by atom). At the moment, attention is focused on carbon atoms, the skeleton of matter, but soon it could be extended to other elements. In short, scientists would like to control the elements of the Periodic Table at will; according to science, this would allow combining the characteristics of a product (such as color, resistance, melting point, ...) in a manner completely different from what has been possible up to now. For example, the enterprises that deal with nanotechnology have tested new products such as stain-proof fabrics, self-cleaning windows, cement with special characteristics, anti-pollutants for diesel, etc.

As absurd as it may seem, nanotechnology has the pretension of making new products by constructing them atom by atom. For example, it has the ridiculous idea of replacing food with an ensemble of atoms that could be transformed into wine or whiskey or orange drink, depending on the need of the consumer, "simply" by triggering off a determined reaction.

The enthusiastic supporters of nanotechnology have thought that ultimately if one reaches the point of manipulating matter in its most basic component, the atom, why not mix biotechnological studies of the biomolecular world with the precisely with the research on atoms? Thus, nano-biotechnology is born. No longer satisfied with creating new apparently *static* products starting from atomic technology, instead by blending it with the technology of life, it aims for the creation of new products where the boundaries between living and non-living beings are erased. For example? Self-cleaning plastics in which enzymes feed on the dirt, airplane wings full of proteins (if the wing breaks, proteins that function as adhesives are released repairing it), ultra-fast computers with circuits based on a "framework" of DNA, electric conductors of dimensions on a nano scale in a protein base, i.e., the "living plastic" built on a genetically manipulated bacterium capable of producing an enzyme that can polymerize according to scientists.

But the applications unfurled before the great public are just shoddy goods, useless innovations to satisfy infantile desires generated by technology in the "consumer". And, in fact, the applications described above for the manipulation of matter turn out to be just the tiniest part of the results sought in current research projects. The miniaturization of information processors is concealed within these worthless gadgets, and this is of some importance. This miniaturization will lead to the presence of "intelligent" microchips on any object in the market, from scales to clothes to pens all the way to nutritional mixtures capable of communicating with the refrigerator.

But this final application foreseen for these microchips is not certain, and it is not the first time that behind the humanitarian pretenses or the miraculous improvement of the average lifestyle there is quite a different project hidden, carefully concealed from most of us. This is the case for the most disturbing applications of nanotechnology, such as the human-machine link or the application of subcutaneous microchips, which use as their excuse the combination of the curing of rare diseases and the protection of poor, defenseless citizens from brutal criminals.

In fact, the field I which nanotechnology is most developed is that which is linked to military studies. The scenarios that the media showed during the last war in Iraq already pointed to the finalization of "intelligent" equipment capable of adapting itself to internal and external conditions and weaponry that was also endowed with extraordinary powers conferred by sensors, microchips and so on.

An obvious example is that of the MEMS (micro-electrical-mechanical systems), the first generation of nano-machines. These are miniature receivers and motors the size of a grain of dust, the proto-types of which are already coming into use in industry. The application currently being studied is that of surveillance powder that will be sprayed onto a battlefield or into an area under observation in order to get various types of information. The future of the robotics of war is increasingly that of versatile and low-priced micro- and nano-robots used as highly specialized weapons.

In the wake of these studies another important aspect is that of social control. A chip the size of a grain of rice that is meant to be inserted under the skin has been put on the market by the American company Applied Digital Solutions. It is called the Verichip and is capable of containing information about the person and can be endowed with GPS capabilities that would allow knowledge of where the person "wearing" it is at all times (one can even buy it on the Internet if one wants to know it up close). The Verichip can be injected with a syringe, using a simple local anesthetic. It is sold as an electronic bodyguard for preventing abductions, so that already many multi-millionaires are requesting it. But an intuition easily develops that soon such a chip will not be an optional convenience for the rich, but rather a heavy burden for the poor. At the beginning, they extol the humanitarian aspects of such instruments, mentioning that in some cases they will be of use to doctors for intervening quickly or to police for preventing abductions and violence.

Then applications on increasingly larger portions of the population will be justified until the day in which we cannot live without it. On that day the chip implant will be obligatory and getting rid of it will be a serious offense.

Finally, the chips that the British government proposes for implanting in pedophiles who are already sentenced are the latest frontier. Besides registering the position of the one under surveillance, these chips will register the heartbeat and arterial tension, giving a warning about the imminence of an eventual act of violence. It will not signal a state of sexual arousal, but nervousness and fear. The same nervousness and fear that a thief or a saboteur might feel while at work. Besides, one should not consider the pedophilia alarm, with which the media has been bombarding us for years in a way that is hugely disproportionate to the reality of things, to be incidental to the project of social control.

By maneuvering collective hysteria in this way, children increasingly become the objects of state property, and thus their protection becomes an obligation to carry out. This doesn't merely justify chip implants in pedophiles, but also the proposal of experts and parents' associations to *chip* all the children in England after the latest extraordinary case of Holly and Jessica, raped and murdered in 2002. But who will protect these children from the penetrating eye of their parents and the state? Who will protect them from the inescapable network of technological control?

We might, indeed, be the last generation of human beings lacking technological prostheses at birth.

The great importance of nano-biotechnology for the economic and institutional world is shown by the huge appropriation of funds by the American government, which invests between 600 and 700 million dollars a year in the development of the sector. Furthermore, in Europe there is enormous financing for research projects or centers dedicated to the development of nanotechnology. The case of Grenoble is revealing. It is the French town considered to be the European capital of technological development, where some projects financed by the European Union benefit from funds of hundreds of millions of Euros. Among these is Minatec, considered the European project capable of competing with the largest Japanese and American rivals, originating in the efforts of the EU and multinationals like Philips, Motorola and STMicroelectronics.

In past years, science fiction has entertained us with stories about replicants capable of multiplying autonomously and in great numbers until they conquer the earth. This is also the fear many experts feel about nano-biotechnology, that some artificially constructed living organism could escape the controls of science and live, multiplying itself beyond measure (a fear that is concretely verified for the products of genetic manipulation).

But as always, every fear, and not just those that are most absurd, is set aside in the name of progress to the benefit of humanity. Furthermore, the world of science has always been defended by maintaining that the misdeeds of techno-science are due to the bad uses that have been made of the knowledge; by maintaining, as always, that

technology is neutral, just as those who, with their studies of nuclear science, then fully contributed to the bombs that fell on Hiroshima and Nagasaki, to the tragedies of nuclear accidents and to the proliferation of armaments, were quick to say. It is certainly not by allowing the usual experts from the same academic-political world the only say in the matter that we will be able to resolve such questions. Nor will we be able to do so by placing our trust in the information arising from the scientific world since one of its current prerogatives is to openly make people accept the new technological applications of scientific research. In reality, its transparent information merely communicates decisions to us that have already been made in our names and over our heads and discloses the results of research that has already been carried out.

Who knows if in the case of nano-biotechnology, as already happened with biotechnology, those who claim to oppose it will once again venture into demands for regulation, precautionary rules, independent structures of control...

Then the story will end just as it did for biotechnology: a minimal opposition to applications related to food with arguments easily recuperable (and recuperated) by a part of the scientific clique, with transgenic food that already makes part of our daily diet. No opposition at all to medical biotechnology that is rather looked upon by all as a great opportunity for sick people.

And these things are really what the entire apparatus that has everything to gain from biotechnology focuses on: no more debate on GMOs in the dietary field, no more alarmism, no more news, despite the fact that there are still people who want to struggle, opposing the harm with the only possible solution: destruction.

And so it will happen in the field of nano-biotechnology. As soon as it is talked about and the scenarios are made increasingly clear, the sterile opposition will raise on oppositional voice about the dangers inherent in those projects that are most open to question such as those in the dietary or military fields. Nothing more.

What to do? If Kevin Warwick is right, then we will stock up well on bananas, because we will certainly be among those who form the chimpanzees of the future. But it is known, even a well-known film teaches us, when chimpanzees get pissed off...

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