

## Reshaping the world: contemporary science as damper of social conflict

There are indefinitely many topics that may be investigated. Human desire for knowledge can be satisfied in many ways, and knowledge can be pursued in sundry manners and directions. To justify the present course of scientific research, in particular where the highest investments (of money and people's time and effort) are made, simply one cannot get away with just referring to vague notions from philosophical anthropology. In particular, the "desire for knowledge" might be satisfied with an higher probability of success by studying the huge amount of notions that can be considered as already reasonably settled and tested, rather than by trying to solve open problems. This is enough to show the insincerity of basing a defence of scientific research on that supposed "desire".<sup>1</sup>

In the Sixties – quite a long time ago, in many ways – the idea that a new form of society would have come hand-in-hand with a new form of science was commonplace in some political and intellectual circles, and enjoyed a wide circulation well beyond those circles, often eliciting shocked or indignant reactions. In its Marxist version it predicted that after the communist revolution had taken place, what we now call science, and in fact is just *bourgeois* science, would have been substituted by *proletarian* science – something that at present could only be dimly imagined. As always, there were a few people that used these concepts to pursue concrete objectives, more or less effectively, and most others who were just glad to adopt a jargon which aligned them with current fashion, and its associated prospects, or fancies, of self-promotion.

As everyone knows, the Sixties were followed by the Seventies... and other decades up to the present, nebulous times. The world did not undergo a general revolutionary overhauling -- or at least *not* one in the direction of more freedom and democracy --, and people found themselves coping with the same old science, except that in the meantime it had become even more pushy and aggressive. The concept of a politically coloured science -- a «non-neutral» science<sup>2</sup> -- disappeared from the public discourse on science. Today, particularly after the demise of self-defining "communist" governments in East Europe, science is commonly portrayed as it were in command of political life, rather than the reverse.

In this article I wish to discuss the political role of science and technology in our world, to describe the ideology which supports them in the mainstream media, and to briefly examine some examples. We shall see that technoscience has never been so politically important, notwithstanding the eclipse of a serious reflection on this phenomenon in both political "wings", particularly the "left". To put it in a nutshell, technoscience occupies today the place left empty by religion as the main ideological tool to repress or prevent, by both promises and "miracles", political protests and claims by exploited groups.

### ***The current ideology of science***

Here is a preliminary sketch of the current ideology of science. Scientists are shaping our future and leading us to an epoch of unheard-of progress and happiness. They do what they want, when they

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<sup>1</sup> This is a remark that was developed very eloquently by the German sociologist and philosopher Georg Simmel [1977, ch. 3].

<sup>2</sup> Charles Snow's 1961 lecture "The Moral Un-Neutrality of Science" is still worth pondering, notwithstanding a fair amount of naivete (Snow 1961).

want. It so happens that quite often their free thoughts lay the ground for some invention that will change our life – for the better, of course. Scientists are led by their curiosity. Admittedly, scientific curiosity can be satisfied only when a sufficient amount of money is available to pay for the expenses of research and, more often than not, this is a nontrivial condition. Someone *has* to pay, it is true. But *who* pays is regarded as a question of no relevance, as far as the content, soundness, and direction of science are concerned. Science is an unmoved mover, like Aristotle's God.

An indirect consequence of this view is that social conflict is obsolete – although not in the sense that the utopian communist classless society is to the fore. The idea is that the only way for members of a downtrodden social class to improve their condition is to give their honest contribution to augmenting the economical strength of the whole society. Science will take care of the rest.

The fact that industries have private owners seems to be no more an issue, since it has apparently been proven by historical experience that private ownership of the means of production is the key to good applied science, economical progress, and widespread well-being. Moreover, private entrepreneurship is not only a good thing in itself, but can only thrive if it is *free* -- which involves also big public expenditures to protect its workers in case of failure of a firm, and to cover the social costs of new technologies. There is a small problem, though: the free market has a dangerous tendency to limit its own freedom, and also not to make an honest use of it. The solution seems to be – to paraphrase Rousseau – *to force it to be free*. This is done quite comfortably by establishing several kinds of regulatory agencies and “authorities”, which supervise – in a very discreet way – industry and prevent proprietors from making secret agreements between them in order to keep prices high, and quality and safety low (because, it is admitted, to care too much for quality and safety is detrimental to profits).

This fairy-tale is the main political and historical ideology passed off, most often in an implicit way, by the mainstream media and intellectuals. They are skilful in suggesting that individual or collective opposition to any supposedly scientific innovation or research is in itself a symptom of “scientific illiteracy” (this is the catch phrase) – and, politically, of a craving for a past which either never existed or is gloriously lost. Voltaire’s Pangloss could hardly have been more optimistic than today’s apologists of the capitalism-plus-science alliance.

In the following I wish to deal with evidence that *a sizeable portion of scientific research today can be best understood as a well-funded endeavour to make this world-view viable or, at least, palatable* (with a *big* help from the media), so that the present system's gross inequalities and iniquities can be guaranteed to persist.

### ***Human nature in brave new world***

The current ideology has encouraged a major change in our perception of ourselves – of our needs and aims.

The classical (for instance Aristotelian) concept of man included the notion that there are basic needs whose satisfaction defines what it means to live a happy life. These needs are not identical to our subjective desires. There is no guarantee that what we wish, no matter how strongly, is going to bring us any nearer to individual or collective happiness; on the contrary, it is all too easy to long for something which will decrease, in the medium or long term (and sometimes even in the shortest term!), our happiness. Desires are not the ultimate criterion of value. They must be themselves evaluated in terms of a *normative ideal of human nature*.

Current ideology runs counter to all that. Desires are seen as the spring of human progress – particularly, desires of commodities or services which are on offer now or in the near-future. To create in the mass new desires of marketable things and services is not only morally unobjectionable, it is a *good* undertaking. (The embryonic theorization of this notion can be found in Mandeville’s *Fable of Bees* (1717-1732)).

As to individual well-being, there is no such a thing as “natural” health. Health (mental and physical) is the name we give to our success in establishing a (temporary) balance between our desires, whatever they are, and our ability to satisfy them. The achievement of such a balance does not depend on following the Socratic advice of knowing oneself, body and mind. In the utopian future, everyone will be programmed to have the desires appropriate to their stance in the world, and endowed with the necessary means to satisfy them. There is no practical limit to the scientific malleability of “human nature”. Everyone will be as happy as conceivable, and such words as social and economic inequality will go out of usage.

According to the currently prevailing ideology, what we call “nature” is just a set of accidental constraints – both internal and external – that humans in their prime worshipped, only to discover, millennia later, that they had rather to learn how to master them and, if so they wished, modify them.

There is nothing intrinsically “good” in nature, nothing in it deserving human reverence. Moreover, humans are themselves part of nature. Whatever humans do, nature does. There is no opposition between nature and history since, as we know since the demise of the Bible’s authority and the advent of transformism in biology, nature also has an history. Indeed, nature *is* history, except perhaps at the most basic level of physical laws, and human history is just a very short segment of it. In particular, *human* nature – for all that this notion is worth – is historical and society-dependent. A school of thought (*posthumanism* or *transhumanism*) has recently gone to the lengths of welcoming whatever changes in the design of the human body and mind that might be judged as improvements with respect to the frame built through trial and error by evolution.<sup>3</sup>

### ***Reactionary scientism as a religion***

While it is ready to pour scorn on traditional values, and especially on religious ones, the ideology described here is in fact itself a religion, having as its main ingredient the idolatry of science (for this reason it may be classified as a variety of *scientism*); in particular it firmly believes in its purported ability to 1) inspire timely technological solutions to social problems, 2) solve any problems it has itself generated. This frame of mind is what I have called elsewhere *technological fideism*.

For instance, here is what Nobel prize winner Peter Medawar had to say in 1969 on environmental pollution:

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<sup>3</sup> Cf. the website [www.transhumanism.org](http://www.transhumanism.org) and, for a criticism, McNamee, Edwards 2006, where the following quotation (2005) from Max More, «one of the most celebrated advocates of transhumanism», can be found: «“Transhumanism” is a blanket term given to the school of thought that refuses to accept traditional human limitations such as death, disease and other biological frailties. Transhumans [or rather “transhumanists”!] are typically interested in a variety of futurist topics, including space migration, mind uploading and cryonic suspension. Transhumans are also extremely interested in more immediate subjects such as bio- and nano-technology, computers and neurology. Transhumans deplore the standard paradigms that attempt to render our world comfortable at the sake of human fulfilment»).

The deterioration of the environment produced by technology is a technological problem for which technology has found, is finding, and will continue to find solutions.<sup>4</sup>

In a way, this is a bold statement, since the standard scientific ideology involves a flat denial that scientific technology has *any* relevant role in producing the evils suffered by people: nuclear power is safe, air pollution does not cause serious illnesses, power lines and masts are at worst only ugly to see, food additives and chemical enhancers are innocuous, GMOs are the key to solve the problem of world hunger, and so on. If only people knew more about science, then they would welcome just anything science is presenting them with. Conversely, for every positive change that we see in our lives, particularly the increase in life expectancy, credit is given to scientific research, even without any specific evidence. For every problem the ideology's answer is the well-known mantra “more research is needed” (and ought to be funded). A more recent example of the same attitude comes from a book review on *Nature*:<sup>5</sup>

[...] in the light of the sheer intensity of scientific research today, and of our apparent newfound capacity to solve whatever problems afflict us, the twenty-first century must surely rank by far the finest time to be alive.

You need to have a real cheek to write such stuff after Chernobyl (1986), let alone Fukushima (2011), and after decades of unsuccessful attempts at solving the problem of radioactive waste of nuclear reactors worldwide. But cheek is the quality mainstream science writers lack less.

The version of scientism we are considering is very different from the XVIII century exaltation of science as a means to liberate humans from religious fears and traditional authority. The old version fuelled popular request for political change, by questioning and, indeed, debasing the whole power system, the new one sedates popular unrest by rejecting in principle that people's suffering may be linked with the very introduction of some scientific technology, and promising technological solutions for just anything in an indefinite future. Those who protest their condition should just wait and see the wonders scientists are concocting to help the world. Therefore this political ideology well deserves the name of *reactionary scientism*. Notwithstanding its emphasis on “science”, it is in fact a variety of irrationalism, geared to preserve the political *status quo*.

Notice that there is no denying that technology-building, in the widest sense, is an important component of human nature. No one can be “against technology”, but one can certainly be against *certain* technologies, both in the sense that to develop them is a bad solution to certain problems, and in the sense that their unintended and harmful consequences may more than counterbalance any positive contributions.

### ***The ideal researcher according to reactionary scientism***

In order to fit the agenda of reactionary scientism well, researchers must accept a very limited role in deciding what research objectives they are to pursue. They must develop a narrow sort of curiosity, which abhors from asking ultimate questions about their activity, and is just aroused by the prospect of solving a puzzle in a manner which could win the admiration, or the envy, of colleagues. On top of that, they must accept to have their curiosity assigned by external authorities or sponsors.<sup>6</sup> This is one of the most surprising facts of life that newcomers to the scientific

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<sup>4</sup> Medawar 1982, p. 337.

<sup>5</sup> Myers 2006, p. 512.

<sup>6</sup> Schmidt 2001, ch. 4 («Assignable curiosity»). I strongly recommend this book, one of the few in the sociology of science which has distinctively the ring of truth. The author was fired for publishing it, after 19 years of appointment as editor of *Physics Today*.

profession have to face: usually they are not assumed to develop their own research interests, but rather to get interested in whatever their superiors ask them to delve in. Theirs is an *alienated* sort of curiosity. In this frame of mind it is clear that the way scientific results will affect society or even the very survival of the humankind comes to be perceived as professionally beside the point.

On April 13, 1954, at his hearings Robert Oppenheimer described very well this attitude with respect to the development of the H Bomb:

I think we have to keep strictly away from the technical questions. I do not think we want to argue technical questions here, and I do not think it is very meaningful for me to speculate as to how we would have responded had the technical picture at that time been more as it was later.

However, it is my judgment in these things that *when you see something that is technically sweet, you go ahead and you argue about what to do about it only after you have had your technical success. That is the way it was with the atomic bomb.*<sup>7</sup>

To understand what is meant here by «technically sweet», it is useful to introduce another main actor in the atomic weapons development, the Italian physicist Enrico Fermi. The story is told in the memoirs of the general Leslie Groves, the military head of that Manhattan Project of which Oppenheimer was the scientific head. On the evening of July 15, 1945 (the day before the successful “Trinity” test of the atomic bomb at Alamogordo) Groves «had become a bit annoyed with Fermi». This is why:

[...] he suddenly offered to take wagers from his fellow scientists on whether or not the bomb would ignite the atmosphere, and if so, *whether it would merely destroy New Mexico or destroy the world*. He had also said that after all it wouldn't make any difference whether the bomb went off or not because it would still have been a well worth-while scientific experiment.

On second thoughts, Groves guessed that Fermi perhaps by this talk had meant to «ease the tension», but «[c]ertainly, he himself showed no signs of tension that I could see».<sup>8</sup>

One should not consider this attitude as restricted to special circumstances like those surrounding military research in war time. Consider the experiments performed on the Large Hadron Collider (LHC) at the CERN laboratory near Geneva (Switzerland) from 20 November 2009, after a first failed attempt in September 2008. The collisions have reached energies of 3.5-4.5 TeV (1 teraelectronvolt =  $10^{12}$  eV), and concerns had been voiced by some theoretical physicists that at such energies very peculiar entities could be produced, like strangelets and micro-blackholes, having the power of engulfing our whole planet -- an effect comparable to that on which Fermi was taking wagers.

In a paper published in 2000 the Italian physicist Francesco Calogero wrote, concerning the reassurances on the same issue provided by the official reports about the Relativistic Heavy Ion Collider (RHIC) at the Brookhaven National Laboratory, that they sometimes gave him «the impression that they are biased towards allaying fears “beyond reasonable doubt”», and added:

I am also somewhat disturbed by what I perceive to be the lack of candour in discussing these matters of many people—including several friends and colleagues with whom I have had private discussions and exchanges of messages—although I do understand their motivations. Many, indeed most, of them

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<sup>7</sup> Polenberg 2002, pp. 46-7 (italics added).

<sup>8</sup> Groves 1983, pp. 296-7.

seem to me to be more concerned with the public relations impact of what they, or others, say and write, than in making sure that the facts are presented with complete scientific objectivity.<sup>9</sup>

What makes these remarks frightening is that the attitude that Calogero perceives in some of his colleagues is deployed not with respect to a “minor” risk, but in face of the possibility that the whole Earth might be destroyed as a side effect of experiments performed out of mere “scientific curiosity”! In December 2010 an article on *Nature* announced:

The end of the world is not nigh after all. Flouting predictions from some theorists, microscopic black holes have so far failed to appear inside the Large Hadron Collider (LHC), scientists there have revealed. [...] Physicist Guido Tonelli, the detector’s spokesperson, says that by the end of the next run, the LHC should be able to exclude the creation of black holes entirely.<sup>10</sup>

Obviously there is something deeply pathological for our civilization in the fact that a small minority of intellectuals is allowed to play this way with the destiny of the planet, but what I wish to emphasize is that these people are the final and most exquisite product of the scientific education and training in contemporary world.

This type of researcher *likes* to be connected with the power system, and in particular they consider the scientific career not as an attempt to go to the deepest level of understanding allowed to themselves, but as a variety of social and hierarchic climbing. For instance, participation to conferences is not aimed at sharing results and understanding with fellow-travellers in the knowledge landscape, but as at enhancing one’s status. A satirical article anonymously published in US during the Vietnam war by a «young physicist» describes as follows the performance of the master (humorously named) at a conference as viewed by his student and collaborator:

Fartsworth’s goal is to glibly mention ideas it took both of you two months to duly grasp; to be both confusing and smooth, bored and witty; and above all, to *impress*. And the audience *is* impressed; a few wise guys make attempts to steal away the victory with irrelevant and puzzling questions, but Fartsworth can handle them. He’s a real pro. Everyone is properly bamboozled and Fartsworth is smiling.

Ten minutes later, after the next talk, no one in the room remembers anything about lanthanum-doped CaF<sub>2</sub>, but they do remember Dr Fartsworth. Mission accomplished.<sup>11</sup>

Also the way scientific papers are written is revealing: usually the authors try to reveal as little of what led to their discoveries as is compatible with their claiming priority on them. This is the main reason -- not elegance or brevity -- why most scientific papers are impervious not only to outsiders, let alone to lay people, but even to scientists working in the same field. And of course the less understandable a paper is, the more difficult is to detect errors in it, and therefore the slower the progress of science.

### **Work as slavery**

In general, work for the sake of money or status should be recognized as being a form of slavery, not a tool of liberation -- a punishment, not a blessing. In 1845 Friedrich Engels had explained it very well in his *Condition of the Working Class in England*

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<sup>9</sup> Calogero 2000, p. 198, cit. in Johnson 2009, pp. 830-1.

<sup>10</sup> Brumfiel 2010.

<sup>11</sup> Cit. in Schmidt 2001, pp. 142-3.

Another source of demoralisation among the workers is their being condemned to work. As voluntary, productive activity is the highest enjoyment known to us, so is compulsory toil the most cruel, degrading punishment. Nothing is more terrible than being constrained to do some one thing every day from morning until night against one's will. And the more a man the worker feels himself, the more hateful must his work be to him, because he feels the constraint, the aimlessness of it for himself. Why does he work? For love of work? From a natural impulse? Not at all! He works for money, for a thing which has nothing whatsoever to do with the work itself; and he works so long, moreover, and in such unbroken monotony, that this alone must make his work a torture in the first weeks if he has the least human feeling left.

This de-humanizing effect has been strengthened by the division of labour:

The division of labour has multiplied the brutalising influences of forced work. In most branches the worker's activity is reduced to some paltry, purely mechanical manipulation, repeated minute after minute, unchanged year after year.[Engels gives here a reference to Adam Smith, *Wealth of Nations*, book 5, chap. 1] How much human feeling, what abilities can a man retain in his thirtieth year, who has made needle points or filed toothed wheels twelve hours every day from his early childhood, living all the time under the conditions forced upon the English proletarian? It is still the same thing since the introduction of steam. The worker's activity is made easy, muscular effort is saved, but the work itself becomes unmeaning and monotonous to the last degree. It offers no field for mental activity, and claims just enough of his attention to keep him from thinking of anything else. And a sentence to such work, to work which takes his whole time for itself, leaving him scarcely time to eat and sleep, none for physical exercise in the open air, or the enjoyment of Nature, much less for mental activity, how can such a sentence help degrading a human being to the level of a brute? Once more the worker must choose, must either surrender himself to his fate, become a "good" workman, heed "faithfully" the interest of the bourgeoisie, in which case he most certainly becomes a brute, or else he must rebel, fight for his manhood to the last, and this he can only do in the fight against the bourgeoisie.

Now it is true that due to a century of struggles led by trade unions, working conditions have improved since 1845; in particular work does not take a person's «whole time for itself», and children are forbidden to work in factories -- I am referring to the so-called “developed” countries, of course. And yet very little of the work which is offered to people today can be described as «voluntary, productive activity». For instance, there is not much to rejoice for women to be treated *like men* on the work marketplace; we shall come back to this.

### ***Causality and the intervention levels***

Reactionary scientism is the ideology which underlies the presentation of scientific, medical and energy policy topics in the establishment media. It provides a natural ideological common ground ensuring a stable alliance between researchers and the power elites. In the following sections I shall give some detailed evidence for this claim.

Scientists usually insist that they are not supporting any political agenda, but just trying to make their contribution at the level they are professionally equipped to deal with; and that their work does not prevent other people, at different levels, to make their own contributions. The fallacy in this view is that the decision of working in a certain field *is itself a political decision, not merely a professional one*. And the fact that a certain line of research is better funded than others is objective evidence of its bigger economical and political relevance for the financing institutions or industries.

For instance, it is clear that many chronic diseases (like type II diabetes, heart disease, stroke) are linked to a sedentary way of life. The WHO recommendation for physical exercise is a task difficult to accomplish for most people in the “developed” countries: strange as it may seem, physical

exercise has become a *commodity*, often purchased by subscribing to gymnasias and fitness centres, rather than a freely available opportunity *implicit* in our daily life.

The politics-ladenness of the choice of the intervention level can be explained by means of an elementary example. A glass falls from the table, hits the floor, and breaks down. What is the cause of this event? In an absolute sense, one might argue that the “cause” is a sufficient set of conditions for the event to occur in the light of our knowledge of natural laws (in the widest sense). However, this is not the way we normally talk of the “cause” of an event. We may say that the glass broke down because, for example, 1) the floor was hard, 2) the glass was fragile, 3) you touched it with your elbow, being absent-minded, and made it fall on the ground, 4) someone put it on the table in a position where your elbow could inadvertently hit it and did not warn you (perhaps he mischievously wanted to embarrass you), etc. It is clear that the choice of the causal explanation of what happened embodies very different possible measures to prevent the repetition of the event: 1’) the floor should be made in a softer material, 2’) glasses should be made more resistant, 3’) you should be more careful of your body’s whereabouts, 4’) some people should be rebuked for making pranks in such a bad taste, etc. Now the point is that *all the above explanations are compatible*. And yet they lead to very different countermeasures.

This has to do with a general feature of our ordinary concept of causality. When we say that a certain event *a* caused an event *b*, we mean that *a* and *b* are instances of two classes of events, *A* and *B* respectively, and that there is a generalization stating that an instance of *A* is always (or very often) followed by an instance of *B*, *whenever certain background conditions holds*. In other words, causality talking always assumes that a background has been selected as fixed, but of course this selection is largely subjective. For instance, if we assume that a floor, as a floor, *must* be hard, then we automatically exonerate the floor from any *explicit* role in our statement of what caused the rupture of the glass. Similarly, those medical advisers who insist on lifestyle changes by individuals are usually reticent on the importance of social and environmental factors, that is, of those factors whose change is not in the power of an individual.

So causality talk has an intrinsic non-neutrality as it depends on one’s decision of what should count as fixed and what should count as changeable in a given process. And when this process is a social one, then we are in a case of *political* non-neutrality.

A particularly striking example of this point is given by current projects aimed at contrasting the Earth’s global warming by large-scale projects; this is called *geoengineering*. Examples of such projects are 1) stimulating the growth of phytoplankton in the oceans by iron or nitrogen in order to increase the absorption of carbon dioxide, 2) injecting sulphur or aluminum aerosol in the stratosphere to screen the solar radiation; 3) screening the solar radiation by

constructing 20 electromagnetic guns, each more than a mile long and positioned at high altitudes, that would shoot Frisbee-size ceramic disks. Each gun would launch 800,000 disks every five minutes -- day and night, weekends and holidays -- for 10 years. The guns would aim at the gravitational midpoint between the Earth and the sun, so that the disks would hang in space, providing a huge array of sunshades that would block and scatter sunlight and put the Earth in a permanent state of annular eclipse.

The proponent of 3), a scheme based on an hypothetical technology not yet available, is a U.S. professor of astronomy and optics, who honestly admits: «I know it sounds like mad science», though he immediately corrects the impression of not lacking common sense altogether by adding: « But unfortunately we have a mad planet».<sup>12</sup> These are revealing words. In fact, geoengineering

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<sup>12</sup> Wood 2009.

aims at enabling the military industrial complex to go on in its business-as-usual style. In other words, geoengineers have decided what should stay the same and what might be changed, and they are ready to risk catastrophic experiments on our planet not to disturb the political and economical establishments.

### ***New technology is not always needed and does not necessarily improve life***

Reactionary scientism tends to portray all technological changes as progressive, and to represent opposition to new technology as ideological, that is, as based on essentially a neo-romantic rejection of science. In fact not all technological changes are apt to improve our lives, and not all solutions to important problems are best achieved by the introduction of high-tech tools. In fact as we shall see by some simple examples new technology often changes our life in ways that have never been explicitly negotiated in a public forum, and which bear the imprint of the profit-driven industry that marketed and advertised it in the first place.

#### **(a) Shoes**

A particularly interesting example is also one of the simplest ones: shoes.<sup>13</sup> Of course there are in our daily life many reasons for protecting our feet when we walk, although it must also be remembered that in the millions of years that hominins have been around walking on their two legs (bipedalism), for 99% of that time they have been barefoot. However what I am concerned with here is the use of running shoes to improve performance and avoid injuries to the feet. People have been told by sports doctors for decades that to run barefoot means risking both more injuries and worse performances. However a recent research studying the running styles of both barefoot and shoes-wearing runners has shown that «experienced barefoot runners» adapt the way they land on the ground to the ground surface and hardness, in a way that the latter are often prevented to do by the very shape of the shoe. An anatomist commented:

Although there is no hard proof that running in shoes, especially high-tech or PCECH (pronation control, elevated cushioned heel) versions, causes injuries, in my view there is no compelling evidence that it prevents them either. However, there are data that implicate shoes more generally as a plausible source of some types of chronic foot problems.<sup>14</sup>

Nonetheless, I imagine most of my readers have been virtually educated to have a very high opinion of running shoes as compared to the “primitivism” of barefoot running, and perhaps never thought of even there being here an issue. This is a fact which instantiates a general social phenomenon: industry and its PR employees have often succeeded in convincing the masses that they would have got a considerable advantage from using a certain commodity even though no evidence for this claim had ever been provided. The recent emphasis on evidence-based medicine is only a case of a more general attempt at defining and implementing a much needed *evidence-based consumerism* -- and consumers associations usually publish magazines trying to provide their readers factual assessments of quality of commodities.

#### **(b) Roundabouts**

An example of a problem which has been solved not by more technology but by less, is the problem of managing the car traffic at the crossroads. The traffic lights can be made indefinitely more “intelligent” by introducing a computer which records and statistically elaborates the car flows in

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<sup>13</sup> Jungers 2010, Lieberman *et al.* 2010.

<sup>14</sup> Jungers 2010, p. 434.

the different directions, so that it can modify accordingly the time the green signal is on for each direction.

However, shifting the viewpoint from centrally directing traffic to exploiting its natural self-regulating power leads to a completely different solution: roundabouts,<sup>15</sup> a zero-technology system, whose introduction has been delayed for several decades due to an authoritarian approach to the problem with its stress on technology. In Britain the first roundabout was built in 1909, but only after the mid-1960 roundabouts this solution started to be widely used.

What is more, roundabouts are actually safer than standard junctions, with or without traffic lights:

Roundabouts are safer than both traffic circles and traditional junctions—having 40% fewer vehicle collisions, 80% fewer injuries and 90% fewer serious injuries and fatalities (according to a study [...] of a sampling of roundabouts in the United States, when compared with the junctions they replaced). Roundabouts also reduce points of conflict between pedestrians and motor vehicles and are therefore considered to be safer for them. However, roundabouts, especially larger ones with faster traffic, are unpopular with some cyclists. This problem is sometimes addressed at larger roundabouts by taking foot and bicycle traffic through a series of underpasses or alternate routes.

At traditional junctions with stop signs or traffic lights, the most serious accidents are right-angle, left-turn, or head-on collisions that can be severe because vehicles may be moving fast and collide at high angles of impact. Roundabouts virtually eliminate those types of crashes because vehicles all travel in the same direction and most crashes are glancing blows at low angles of impact.<sup>16</sup>

It is clear that if only electric engineers had been charged with solving the problem of vehicle traffic, the solutions would have been more and more traffic lights and an increasingly sophisticated software controlling them. This would have given the deceptive impression of a serious and reliable approach to the problem, and no one would have suggested an approach making his professional expertise useless .

### **(c) E-books**

Let us consider now the issue of the technological improvement of traditional tools. An instance is provided by the electronic versions of one of the best established commodities of the last 5 centuries: the book.<sup>17</sup> The simple truth about this tool of learning and entertainment is that it solves optimally most of the problems it has been created to solve. To most book-lovers it may only seem ludicrous to suppose that one might improve on it as far as its standard uses are concerned. Here is how a student from Princeton university put it, after having been involved in an experiment to evaluate the respective usefulness of books and e-books:

«I hate to sound like a Luddite, but this technology is a poor excuse of an academic tool,» said Aaron Horvath '10, a student in Civil Society and Public Policy. «It's clunky, slow and a real pain to operate.»

Horvath said that using the Kindle [a well-known e-book reader] has required completely changing the way he completes his coursework.

«Much of my learning comes from a physical interaction with the text: bookmarks, highlights, page-tearing, sticky notes and other marks representing the importance of certain passages — not to mention margin notes, where most of my paper ideas come from and interaction with the material occurs,» he

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<sup>15</sup> See the Wikipedia article (<http://en.wikipedia.org/wiki/Roundabout>).

<sup>16</sup> “Roundabout”, Wikipedia.

<sup>17</sup> Mello 2011.

explained. «All these things have been lost, and if not lost they're too slow to keep up with my thinking, and the "features" have been rendered useless.»<sup>18</sup>

From the viewpoint of those in the publishing business the print book has many serious blemishes, a major one being that used books can be re-sold, with no gain whatever for the publishers: this is clearly very disturbing to them,<sup>19</sup> no matter how convenient it might be for for both readers and the environment.

The main investors in the development of the e-book technology (in particular Amazon and Sony) have been advertising worldwide in the last decade what a big deal (in every sense) for readers it will be. In July 2010 Amazon has astutely "disclosed" that in a sense the revolution has already occurred, since for every 100 paper hardbacks they have sold (or so they say) 143 e-books; in January 2011 they have added a new record: for every 100 *paperbacks*, they have sold 115 e-books. Both data are not as dramatic as they may seem at first, since Amazon holds on one hand only a 15% share of the U.S. sale of paperbacks, and on the other hand 80% of the corresponding share for e-books. In Europe the maximum rate of e-books with respect to all books sold has been reached in United Kingdom, with 2-3%; Italy and Spain are at a scant 0.5%.

It is interesting to remark that present-day e-book readers are white-and-black and have a display of little more than 9 by 12 cm (that is, 35% of an A5 page format). Moreover the results of a 2009 survey at a U.S. university (the North West Missouri State University) seem representative of the general attitude among students:

A survey by NWMSU in February found that, all things being equal, about half the students would prefer print textbooks and about a quarter would prefer e-textbooks, whereas the remainder had no strong feeling. But when asked what they would do if buying a textbook themselves, almost 80% said that they would opt for the cheaper e-textbook offering.<sup>20</sup>

In other words, most students think that to pore over an electronic device is worse than working on a traditional book, but might be cheaper.

Actually even the conjecture that e-books are cheaper may be incorrect. In fact -- and this shows the eternal "other side" to profit-driven technological innovation -- the publishers wishing to enter the e-textbook market want to limit the degree a student becomes proprietor of the e-text he buys, and prevent unauthorized copying. To this aim they put limits to the number of pages that may be printed at a time (no more than 10) and to the possibility of printing the whole book (no more than once), and they also put... an expiry date to the e-book itself. Since students usually save half the price of the print textbooks by selling them (an unfortunate habit, incidentally), they can be excused if they find that an expiring e-book at half the price of the print version is not exactly a bargain.<sup>21</sup>

For those who earn money by selling books, often with very little gain to the authors, the transgenerational permanence of print books and the very existence of libraries are a bale, so they try to suggest that the only valuable books are those just or (at least) *still* in print. As a matter of

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<sup>18</sup> Lee 2009.

<sup>19</sup> «Thanks to the Internet, what was once the preserve of local used bookstores is now a vast and sophisticated international online market. The US market for new textbooks is estimated at around \$5.5 billion, but the parallel market for used books is around one-third of that, says [Joe] Esposito [a digital-media consultant and former chief executive of *Encyclopaedia Britannica* online]» (Butler 2009, p. 569).

<sup>20</sup> Butler 2009.

<sup>21</sup> «Charging half the price of a printed textbook for an e-book that expires is "far too costly", says [Kevin] Hegarty [chief financial officer of the University of Texas at Austin]» (Butler 2009, p. 570).

fact, the contrary can be argued in many cases, but book magazines apparently have no interest in dealing with books that can be taken on loan or bought second-hand, so they try to inoculate their readers with the superstition of “novelty as value”: the last essay, the last novel... Indeed, even the last edition of a *dictionary* or an *encyclopedia* may not always be the best choice.

#### **(d) Multi-medial teaching**

Multi-medial teaching is a related growing industry, whose PR representatives (inside and outside the academia) have been hard trying to convince everybody that e-learning, slides (or PowerPoint presentations), and the ubiquitous use of electronic devices improve the learning ability of students. Now there is no doubt that many, perhaps most students *enjoy* watching pictures on a screen, but it is a very different issue whether one can exploit this inclination for pedagogical purposes.

Consider PowerPoint, a program for making presentations which has been introduced in 1984 and then adopted by Microsoft (during this lecture I am using an open-source version of it; I use it because, notwithstanding its limits, it enables me to make a bilingual exposition). In a conference setting it can certainly be useful, if used sparingly and to supplement the oral explanation with key details, quotations or pictures. On the other hand, using it as a primary tool of exposition, and worse of all in the class-room, leads to disaster: it produces boredom and passivity in the audience, and oversimplification of ideas in the speaker. Edward Tufte, a real expert (a professor of «political science, computer science and statistics, and graphic design at Yale»), puts it very effectively:

[...] slideware -- computer programs for presentations -- is everywhere: in corporate America [and Europe, NdC], in government bureaucracies, even in our schools. Several hundred million copies of Microsoft PowerPoint are churning out trillions of slides each year. Slideware may help speakers outline their talks, but convenience for the speaker can be punishing to both content and audience. The standard PowerPoint presentation elevates format over content, betraying an attitude of commercialism that turns everything into a sales pitch.<sup>22</sup>

In fact the Columbia Accident Investigation Board pointed out, citing Tufte’s analysis of a certain PowerPoint slide which had been shown to NASA senior managers in January 2003, that «It is easy to understand how a senior manager might read this PowerPoint slide and not realize that it addresses a life-threatening situation».<sup>23</sup> A very dramatic example of MacLuhan’s «The medium is the message» phrase, indeed. In general PP presentations have a strong tendency to hide the difficulties in the speaker’s claims, and encourage or comfort an authoritarian stance in the speaker.

As to teaching, it has been argued at length what seems to me, as a teacher, a rather obvious point: that the less technology teachers bring into their classrooms, the more likely it is that their students will take advantage of going to classes.<sup>24</sup> This of course does not mean that the Internet has no legitimate role to play in teaching.

The viral spreading of PP presentations is an example of how a certain technology, with very serious built-in shortcomings, may propagate and become standard without a real assessment having ever been made. And yet it may affect negatively a vast area of human activity.

#### **(e) Cell phones**

My last example is cell phones. They have spread like a pandemic disease, thanks to very aggressive marketing campaigns worldwide. Now it is true that the owners of a portable phones have an immense power: they can contact, and be contacted by, everyone everywhere at any time...

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<sup>22</sup> Tufte 2003.

<sup>23</sup> Cit. in Marcus 2005.

<sup>24</sup> Cf. Bowen 2006.

However, there are important features of the “old phone” communication that have been lost by the introduction of the portable phones: first of all the “stability” of the contact. As has been said humorously:

I started to distrust telephones the instant they stopped working. I can't pinpoint when that was — the first time I “dropped” a call, or someone said, “I'm losing you” — and I don't know why the telephone, the analog landline telephone, was never formally mourned.<sup>25</sup>

The same author goes on remarking that a whole social universe was related to the traditional usage:

A conversation could last hours upon dazed hours, as you sat on your parents' bed, twirling the curly cord, or hauled the house phone into the bathroom, the better to monopolize family telecommunications. Chortling, gasping, sighing, sobbing, throats catching or forming word after idle or impassioned word: you made every sound that humans make and thus joined your solitudes. [...]

Your phone voice was distinctive; your phone manner was distinctive. [...]

There were fears, before voicemail, that call-borne opportunities might be missed forever, but there was no “We have a bad connection,” “I'm going into a tunnel,” “My battery's dying,” “I have to take this” or “I have only one bar.” [...] Sound signals, so unfaithful to the original they hardly seem to count as reproductions, come through shallow. You can hardly recognize voices. Fragile, fleeting connections shatter in the wind. You don't know when to talk and when to pause; voices overlap unpleasantly. You no longer have the luxury to listen for over- and undertones; you listen only for content. Calls have become transactional, not expressive. The oddly popular option to use the speakerphone means that you never know when what's left of the old telephone intimacy might be compromised. You certainly can't trust that it will be there anymore, ever.

I think this description, which everyone will recognize as realistic, is enough to show that, even from a strictly technical viewpoint, it is very doubtful that there has been a simple progress from the analog to the cell phone. But of course there is much more than that. Portable phones have revolutionized the worker's life by blurring the demarcation line between workplace and home, acting so to speak as electronic leashes which guarantee the ubiquitous availability of the employees by their employers. The image of freedom that portable phones are normally associated with in marketing campaigns camouflages the reality of a new tool for control and repression. This confirms what John Stuart Mill wrote in his *Principles of Political Economy*: «It is questionable if mechanical inventions yet made have lightened the day's toil of any human being», a passage that Marx cited with approval -- except that he suggested that the phrase “of any human being” should be substituted by “of any human being not fed by other people's labour”.<sup>26</sup> And it refutes John Maynard Keynes's prediction in 1930 that *his* grandchildren would have enjoyed «[t]hree-hour shifts or a fifteen-hour week».<sup>27</sup> In fact

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<sup>25</sup> Heffernan 2010.

<sup>26</sup> Marx 1952, p. 180 (ch. XV).

<sup>27</sup> «For many ages to come the old Adam will be so strong in us that everybody will need to do some work if he is to be contented. We shall do more things for ourselves than is usual with the rich to-day, only too glad to have small duties and tasks and routines. But beyond this, we shall endeavour to spread the bread thin on the butter-to make what work there is still to be done to be as widely shared as possible. Three-hour shifts or a fifteen-hour week may put off the problem for a great while. For three hours a day is quite enough to satisfy the old Adam in most of us!» (Keynes 1930).

The number of hours worked in the United States has remained pretty much steady for decades, and is 30% higher than in Europe. Europeans tend to use up all their holiday entitlement; Americans, even though their vacations are shorter, do not.<sup>28</sup>

According to the International Labor Organization, one fifth of the workers works for more than 48 hours a week, and there are also workers that make themselves available for 24 h a day. A study by the WHO has linked the extra work to an increase from 30 to 80% of the incidence of cancer.<sup>29</sup>

Exposure to radiation coming from cell phones is another hazard on which very little emphasis has been laid in the mainstream media.

### ***Woman liberation, the labour reserve army, and home management***

No one, at least in the cultivated citizenship of contemporary western societies, would hold that there is some political right that a person should be denied *merely because of their sex*. A different and nontrivial issue is whether sex is involved in preferences and abilities that people have for playing certain social roles or for fixing to themselves certain objectives. There is a variety of “feminism” which denies bluntly that any such preferences exist. One may doubt the sincerity and, more importantly, the soundness of this position.

For instance, while it is false that *all* women at all epochs have been motivated by an irresistible inner drive to devote an important part of their lives to child bearing and nursing,<sup>30</sup> nevertheless the human kind would not be here at present if *most* women had not lived this way during most of human history and pre-history. It is ludicrous to suppose that this may have happened only or mainly because of male coercion. Clearly most women have an inborn physical and psychological potentiality to motherhood such that, even though special social circumstances, or a vocational attitude for an artistic or professional activity, may hinder or stifle it, they actively seek to express it whenever barely appropriate conditions are satisfied.<sup>31</sup>

Granted this premise, it seems obvious that women’s rights should include the conditional right to be a mother, because of the obvious public interest in promoting this attitude when it exists; for the same reason public economical support should be provided to those women who could not otherwise afford to have children.

Women liberation should have included from the start the most obvious meaning of *enabling women (and men) to make their choice* as to whether and when to procreate and how much time to devote to parental work. In this case as in many others, true liberation *must involve shifting in spectrum of options in the right direction, or at least expanding it*. In fact, in western countries a very convenient notion of “women liberation” has prevailed – channelling women into the labour force pool, a feat which has been accomplished by the simple trick of making a single average salary insufficient to sustain a family, and simultaneously by creating and advertising a new gospel – consumerism – with its elastic notion of poverty. Ivan Illich described the latter transformation as follows:

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<sup>28</sup> Elliott 2008.

<sup>29</sup> Livini 2011.

<sup>30</sup> Cf. Badinter 1980.

<sup>31</sup> This conjecture might be tested by a relatively simple social experiment: introducing a guaranteed minimum income for “unemployed” people, and then measuring in the next 10 years 1) the variation in the average number of children for each couple, and 2) in the case of couples with small children, the sex ratio with respect to the choice of working at home.

By 1970 poverty in public parlance had acquired a new connotation – that of an economic threshold. And this changed its nature for modern humans. Poverty became a measure of a person's lack in terms of "needed" goods, and even more of "needed services". By defining the poor as those who lack what money could buy for them to make them "fully human", poverty, in New York City as well as in Ethiopia, became an abstract universal measure of underconsumption. Those who survive in spite of indexed underconsumption were thereby placed into a new, sub-human category, and perceived as victims of a double bind. Their *de facto* subsistence became almost inexplicable in economic terminology, while their actual subsistence activities came to be labelled as sub-human, if they were not frankly viewed as inhuman and indecent. [Illich 1992, p. 94]

One century earlier, Marx had lucidly stressed, following Ricardo, the intrinsically socially expansive character of capitalism, which needs to create a «redundant population», or the «industrial reserve army», in order to keep wages at the lowest possible level:

[...] the capitalistic employment of machinery [...] produces, partly by opening out to the capitalist new strata of the working class previously inaccessible to him, partly by setting free the labourers it supplants, *a surplus working population*, [...] *which is compelled to the dictation of capital*. [p. 199; italics added]

In particular women (and children, of course) had to be forced into the factory work, thus provoking a social chain reaction the main features of which are today more prominent than they were in Marx's time, but that Marx described very lucidly:

Since certain family functions, such as nursing and suckling children, cannot be entirely suppressed, *the mothers confiscated by capital must try substitutes of some sort*. Domestic work, such as sewing and mending, must be replaced by the purchase of ready-made articles. Hence, the diminished expenditures of labour in the house is accompanied by an increased expenditure of money. *The cost of keeping the family increases and balances the greater income*. In addition to this, *economy and judgment in the consumption and preparation of the means of subsistence becomes impossible*. [p. 193n; italics added]

In the final statement Marx makes a very important point. The exercise of «judgment in the consumption and preparation of the means of subsistence» has always been one of the main tasks of the *home manager* (usually a woman), and it is obviously even today not only of the utmost importance for a family, but also of *political* relevance for the whole of society. This is an incomplete list of tasks inherent to good home management:

- choosing food produced in certain ways,
- producing a part of the family-consumed food,
- adopting certain recipes and cookery methods,
- guaranteeing the home hygiene with the lowest toxic residua and water usage,
- saving energy in home heating and cleaning,
- reducing and selecting garbage,
- buying products from certain firms but not from others,
- keeping up to date on the relevant medical, economical and political information.

In this list I omitted whatever has to do with children education, or care for any disabled or old members of the family.

Clearly to be a good home manager is a highly nontrivial aim, and it should be economically supported, most conveniently by the introduction of a minimum guaranteed income. On the other hand, it is all too easy to understand why it has been and is being discouraged by the mainstream

media -- that is, ultimately, by those who own a business whose prosperity crucially depends on the mindlessness of their customers. Discrediting home management has been one of the main ideological targets of the big business, and a variety of “feminism” has been widely advertised by the mainstream media as a means to defame the traditional activity of the “housewife” as a silly drudgery. One can only admire the ability of the mass-media ideology purveyors in stressing only the repetitive aspects of home management, on one side, and -- for instance -- succeeding in making the work of an office clerk look glamorous, on the other. To appreciate this point it is useful to read a favourable description of what a clerk office is supposed to do in his or her best weekly 40 hours :

Rather than performing a single specialized task, *general office clerks* have responsibilities that often change daily with the needs of the specific job and the employer. Some clerks spend their days filing or keyboarding. Others enter data at a computer terminal. They also operate photocopiers, fax machines, and other office equipment; prepare mailings; proofread documents; and answer telephones and deliver messages.<sup>32</sup>

While the conscientious performance of these tasks may give the satisfaction of a work well done to people with the right frame of mind, it is very hard to see in general the “liberating” nature of such an activity, which most of the times is done just «for money, for a thing which has nothing whatsoever to do with the work itself», to quote Engels again.

The “modern” couple normally eats outside, that is it implicitly defers to the judgment of others as far as food quality and preparation is concerned, and more generally relies on the false impression of acquaintance generated by frequent and unreflective exposure to advertisements to decide what should get into and over their bodies. The brainwashing has gone so far that today most people when hearing the expression “home manager” think first of all of a computer program, not of a *person*. Of course nothing of the above is meant to imply that only or mainly women should be home manager. By giving a suitable social recognition to this role, I would expect that many more men would like to play it than it is common today.

In any case, it has certainly to be admitted that a society that has to consign children and old people into mercenary hands – very often, in West Europe, the hands of immigrants from poor countries – leaves much to be desired from the point of view of its level of civilization. That the emancipation of women had to be achieved by propagating an ideology which undermines the family links, to the advantage of private entrepreneurs and GNP, is proof enough of its having been engineered, to a considerable degree, to serve the interests of rampant capitalism. True women liberation is impossible without the liberation of all humans from the tyranny of the “profit for the few”.

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<sup>32</sup> This is how the text continues: «The specific duties assigned to clerks vary significantly, depending on the type of office in which they work. An office clerk in a doctor's office, for example, would not perform the same tasks that a clerk in a large financial institution or in the office of an auto parts wholesaler would. Although all clerks may sort checks, keep payroll records, take inventory, and access information, they also perform duties unique to their employer. For example, a clerk in a doctor's office may organize medications, a corporate office clerk may help prepare materials for presentations, and a clerk employed by a wholesaler may fill merchandise orders. || Clerks' duties also vary by level of experience. Inexperienced employees may make photocopies, stuff envelopes, or record inquiries. Experienced clerks are usually given additional responsibilities. For example, they may maintain financial or other records, set up spreadsheets, verify statistical reports for accuracy and completeness, handle and adjust customer complaints, work with vendors, make travel arrangements, take inventory of equipment and supplies, answer questions on departmental services and functions, or help prepare invoices or budgetary requests. Senior office clerks may also be expected to monitor and direct the work of lower-level clerks» (OOH 2010).

## ***Science helps women's enrolment in the labour reserve army***

It is easy to show that the mass enrolment of women in the labour reserve army has caused several adverse effects, first of all to women themselves. What I wish to do in the following subsections is to document the way a sizeable portion of the biomedical research in the last century can be construed as a loyal attempt by the scientific community to smooth the way of the loss of gender-specific social tasks, and the connected ideological denial of specific women's vital needs.

### **a) Reproduction**

In our society a paradoxical phenomenon is observed: *on one hand*, as we have seen, women are systematically encouraged to postpone child-bearing and rearing, indeed to construe it as an hindrance to their “self-realization”,<sup>33</sup> and voluntary abortion is accordingly represented as a civilized option; *on the other hand*, maternity is increasingly represented in the public discourse not as a natural opportunity for most women which society should support, but as a *formal* civil right which should be recognized to nearly every adult, of any sex and age, and that only requires further technological progress to become a *substantial* right. For instance, recently a American transgender person (female to male), married to a sterile woman, was reported to have succeeded in getting pregnant by artificial insemination. In an editorial of the science weekly *Nature* we read:

And yet, when we consider this story with the reasoning parts of our brains, exactly what was so “unnatural”? The longing to have a baby? This is a profoundly human desire, whether the prospective parents are male, female or transgendered.<sup>34</sup>

According to the *Nature*'s writer, «to have a baby» (whatever its meaning) is such a «profoundly human desire» that the way it is achieved does not really matter -- unless it infringes the (country-dependent) criminal laws.

From the viewpoint of reactionary scientism, the fact that (almost) all humans are “of woman born” has nothing sacred or eternal. The differences between the sexes are contingent to a certain level of our knowledge of, and power of intervention on, the workings of the human body and mind. The development of an artificial womb, together with the establishment of easily accessible semen banks, will eventually put everyone in the same position.<sup>35</sup>

As to women, the idea that they should respect the natural “seasons of life” is simply dismissed as inappropriate. If women come “late” (to use the vulgar parlance) to the decision of having a child,

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<sup>33</sup> This discourse emerges in the form of an apology for neglecting one's children; the following quotation is a rather standard statement (a journalist is speaking) : «I see my daughter very little indeed: I take her to school in the morning, then I go to my newspaper and come back home late in the evening, when she is sleeping already. Of course I exploit all available moments, in the days off-duty and on Sunday (it is lucky that [my newspaper] does not come out on Monday) to stay with her, to grant her that “quality time” [English in the original] which is needed for her serene growth. It is superfluous to speak of my sense of guilt: in the first months [of my job at the newspaper] I felt an inhuman, unworthy, sometimes a bad mother. I felt on me the world's eyes, the silent questioning of all who thought: how can you prefer your career to your daughter? I really had some bad moments. Then, however, I understood that loving a son does not mean having to renounce to oneself. If I had said farewell to journalism, or even to [my newspaper] only, in order to be again a full-time mother, I would have damaged myself and my baby. Sure, I would have had much more time to devote to her, but that time would have always been anguished and unhappy. Since the self-realization of a woman is basic for a balanced development of [her] sons» (D'Onghia 2011).

<sup>34</sup> Editorial 2008.

<sup>35</sup> Ectogenesis (the development of the embryo outside a woman's body) as the normal way in the future of humankind was apparently first advanced as an ideal by the biologist J. B. S. Haldane [1924] (Paul 1984, p. 577).

no further questions need be asked, particularly by scientists: their only concern must be to provide a technological answer to the increasing demand for “off-season” pregnancies.

When assisted reproductive technology is mentioned, it is rare to see its problems cited. For instance, the following list of facts seems not to bother in the least the community of mainstream reproduction researchers:

- 1) assisted reproduction is successful only about one-fourth of the times;
- 2) cycles of hormonal stimulation are stressful and mood-affecting;
- 3) the emotional investment a couple has to make in a program of assisted reproduction may easily be disruptive of their union;
- 4) multiple births are much more common (with all complications, medical and economical, associated to them);
- 5) adoption of parentless children is arguably a more sustainable and convenient approach, in many ways, to satisfy the desire of parenthood in a sterile couple;
- 6) sterility is increasingly recognized to depend also on industrial and traffic pollution – the multitude of synthetic chemicals and micro-particles working as endocrine disruptors which have invaded our air, water, and foods;
- 7) sterility as due to late attempts at pregnancy is to a large extent a social fact related to the present organization of labour.

Here is how assisted reproduction researchers react to these points: as to 1)-4), it is a general fact that the biomedical community is in a permanent state of denial of the adverse reactions to *any* medical procedures or drugs and, moreover, one should never forget that science is looking for remedies *also* to any discomfort these procedures are causing (cf. technological fideism); 5) is dismissed by adopting the apparently libertarian stance that it is to the couple to decide the way they want to be parents; as to 6), there are – somewhere – researchers in other fields working to develop less toxic additives, pesticides etc.; finally, to 7) scientists answer that, *qua* scientists, they don't have to care for socio-political issues.

However, the list above shows clearly that to construe couple sterility as a medical problem is to neglect its multilayered nature. To decide that the correct level for an intervention is the medical one is to absolve in principle the economical and political system from its obvious responsibilities.

## **b) Menstruation**

Related to this, there exists also a line of research pursuing how to eliminate menstruation. As an Italian researcher said in an interview, describing a pill presented to the FDA for approval:

[...] thanks to its low hormonal dosage it can be taken 365 days a year. According to some experts two-thirds of the women involved [in the clinical trials] have shown some interest for a product which they consider as innovative: some of them, for example, hold they are too much busy with their work to have to worry about the menstrual cycle.<sup>36</sup>

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<sup>36</sup> Ortolani 2007; my translation.

As usual, as long as a need translates into a request for a commodity, no questions are asked on the origin of that need. A Brazilian scientist, Elsimar Coutinho, has written a book the title of which is a question: “Is Menstruation Obsolete?”, and whose subtitle gives away his answer: “How suppressing menstruation can help women who suffer from anemia, endometriosis, or PMS [premenstrual syndrome]”.<sup>37</sup>

According to Coutinho – the developer of Depo-Provera, a contraceptive which has to be injected, but only twice a year – menstruation is a pathology, a fossil from a remote time when women would bear 10-12 children during their lives, thus having their menses suppressed in a natural way (that is, through pregnancies and breastfeeding) for most of their fertile age. Today, with women having on average no more than 2-3 children, menstruation should be considered as a useless waste.

The interesting thing about this proposal is that a remedy is put forward for a physiological condition whose function is by no means well understood. There is an alternative theory, advanced by a biologist from the University of California at Berkeley, Margie Profet, according to whom «Menstruation functions to protect the uterus and oviducts from colonization by pathogens» coming from sperm: «The uterus appears to be designed to increase its bleeding if it detects infection». Thus to intervene medically to suppress menstruation might be harmful, and to promote infection to the female genitals with its attendant complications.

### **c) Menopause**

The preceding example has strong resemblances with the promise made by proponents of the *hormonal replacement treatment* (HRT), which has been one of the biggest commercial successes ever. In this case the pharmaceutical industries succeeded in convincing millions of women around the world that here was the means by which women would remain «feminine forever».

Menopause in itself is not a disease, of course, but it may be perceived as such, both by late-comers to sexual romance, and by women intimidated by the role models offered by the media, featuring mature actresses whose hi-tech appearance of youth is obsessively advertised.

At the beginning, HRT was prescribed only for menopause disturbances like hot flushes and vaginal dryness, but soon it started to be indicated for many more pathologies, including heart disease, Alzheimer, osteoporosis, and eventually it was taken by healthy women seeking improvements in «sexual function, mood, and overall vitality» (Clark 2003). In 2001 more than 100 million women all over the world were taking it, and in the same year the sales of these drugs climbed to 3,8 billion dollars.

The bad news arrived soon. In 1977 evidence had already been provided of an increase in endometrial cancer when oestrogen was used alone; in 1997 the coupling of oestrogen and progestogen was also shown to be associated to the same kind of effect. In May 2003 the renowned medical magazine *BMJ* had a commentary on a very recent study published by *Journal of the American Medical Association (JAMA)* according to which:

On Wednesday *JAMA* published the study, funded by Wyeth, which shows that the company's [Wyeth] combined oestrogen and progestogen pill doubled the risk of dementia among elderly women from about 1% to 2% over five years. The latest data on dementia come after findings last year which showed that long term use of the drug slightly increases the risks of breast cancer, heart attacks, and strokes in healthy women aged over 50 years (*JAMA* 2002;288:321-33). [Moynihan 2003]

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<sup>37</sup> Coutinho 1999.

In 2003 the British drug agency announced that HRT should not be considered as first choice treatment for osteoporosis in women more than 50 years old. Professor Bruno Müller-Oerlinghausen, chairman of the Germany's Commission on the Safety of Medicines which had recommended use of HRT only for «particularly severe menopausal symptoms», compared HRT to thalidomide -- with reference to the tragedy caused in the late 1950s by that painkiller, which had been widely advertised and marketed as «innocuous» to pregnant women.

In April 2004, a study has been published, on HRT with oestrogen without progestogen, concerning 11,000 women from 50 to 70 followed during almost 7 years. It had to be stopped an year earlier since evidence had been mounting of an increase in the strokes, coupled with absence of heart protection. This time, though, some benefits had been found. On 10,000 woman/year of treatment there are 6 hip fractures *less...* and 12 strokes *more*

In the meantime HRT won a promotion in the carcinogen list of AIRC (press release, July 29, 2005): from Group 2B (possible carcinogen) it became "Group 1" -- that is, a human carcinogen. It is worth mentioning that many more nonfatal but still very troublesome illnesses have also been associated to HRT -- among them hair loss and deafness.

The hormone replacement mass treatment has been defined «THE GREATEST EXPERIMENT EVER PERFORMED ON WOMEN» (this is the title of a book by B. Seaman, published in 2003). As in many similar cases, the human guinea-pigs ignored that this was the role they were playing.

### **Disciplining the mind**

Exploitation in a society where the right of the powerful over the weak has no official recognition requires dissimulation. In a capitalist society this is made, on one hand, by suggesting that there is no way to intervene at the root of the disturbances the social system creates, and on the other hand by offering commercial palliative remedies to the victims. Scientific research is funded to develop those remedies, generally in the form of psycho-active drugs.

### ***Sleep, performance, and "enhancer" drugs***

Present-day labour conditions in the Western world have led to a huge increase in sleep disturbances, for instance in the basic form of the inability to sleep continuously for 7-8 hours. It has been estimated that 3 out of 4 people have «at least one symptom of a sleep problems a few nights a week or more» (Lawton 2006). In order to minimize the number and wages of the personnel, labour shifts are often quite onerous, and it is not surprising that so many people are overworked and tired.

The pharmaceutical industries have found here an excellent field to expand their search for profits. They are funding the dual development of chemicals that enable a person to sleep notwithstanding anxieties and worries, or that keep a worker awake notwithstanding accumulated tiredness. Here is how a researcher in this field explains his view of the question to a reporter of the British weekly *New Scientist*:

“The more we understand about the body's 24-hour clock the more we will be able to override it,” says Russell Foster, a circadian biologist at Imperial College London. “In 10 to 20 years we'll be able to pharmacologically turn sleep off. Mimicking sleep will take longer, but I can see it happening.” Foster envisages a world where it's possible, or even routine, for people to be active for 22 hours a day and sleep for two.

Doubts on this research programme have been expressed also by professionals, who are on record for stating that natural sleep can hardly be substituted with chemically-induced sleep: «But most sleep researchers agree that it is inevitable».

So the research in this field has gone on producing some commercially successful drugs, like modafinil (Provigil) and CX717. The following passage from the cited article is enlightening:

*We seem to be moving inescapably towards a society where sleep and wakefulness are available if not on demand then at least on request. It's not surprising, then, that many sleep researchers have nagging worries about the long-term impact of millions of us using drugs to override the natural sleep-wake cycle.*

[Neil] Stanley believes that drugs like modafinil and CX717 will tempt people to overdose on wakefulness at the expense of sleep. "Being awake is seen to be attractive," he says. "It's not cool to be asleep." Foster has similar worries. "It seems like that technology will help us cope with 24/7, but is coping really living?" he asks. Others point out that there are likely to be hidden health costs to overriding our natural sleep-wake cycles. "Pharmaceuticals cannot substitute for normal sleep," says Vaught.

Still, even the doubters admit that *to all intents and purposes we are already too far down the road of the 24-hour society to turn back*. For millions of people, good sleep and productive wakefulness are already elusive, night work or nightlife a reality, and the “stimulant-sedative” loop all too familiar. As [Jeffrey] Vaught [president of R&D at Cephalon, modafinil's Pennsylvania-based manufacturer] puts it, “We're already there.” So why not make it as clean and safe as possible?<sup>38</sup>

«[...] we are already too far down the road of the 24-hour society to turn back». This is a typical argument from the bag of reactionary scientism: by assuming the impossibility of changing the social conditions which make being awake at any time in the day and the night, «attractive» and «cool» (indeed!), the researchers working to develop drugs which alleviate the symptoms of overwork, noise, stress etc. can be depicted as benefactors – while in fact what they do is instrumental in making it possible for the mental balance of people to be ever more imperilled.

Scientists are giving in the most direct fashion their loyal contribution to the expansion of the market of drugs purportedly modulating sleep and/ or attention: that is, by taking them; as a recent article on *Nature* explained:

In academia, we know that a number of our scientific colleagues in the United States and the United Kingdom already use modafinil to counteract the effects of jetlag, to enhance productivity or mental energy, or to deal with demanding and important intellectual challenges [...] [Sahakian, Morein-Zamir 2007]

The authors blandly comment upon this tendency:

There are also situations in which many would agree that the use of drugs to improve concentration or planning may be tolerated, if not encouraged, such as by *air-traffic controllers, surgeons and nurses who work long shifts*. One can even imagine situations where such enhancing-drug-taking would be recommended, such as for airport-security screeners, or by soldiers in active combat.

Clearly the fact that there are many people who work stressful shifts is not something to be worried about. In fact now we are going to listen to the inevitability song, with a reference to the laws of the market:

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<sup>38</sup> Lawton 2006, p. 52.

We believe it would be difficult to stop the spread in use of cognitive enhancers given a global market in pharmaceuticals with increasingly easy online access. The drive for self-enhancement of cognition is likely to be as strong if not stronger than in the realms of “enhancements” of beauty and sexual function.

The editorial in *Nature* magazine from which we have already quoted replies as follows to the objection that performances realized thanks to «neuroenhancing drugs» are «somehow less worthy because they aren’t natural»:

But again, what is “natural”? Devices such as glasses, hearing aids, pacemakers and artificial hips are unnatural. Yet they are widely accepted as legitimate ways to enhance the human experience. By the same token, if drugs enhance performances on a standardized test, what is so “natural” about prep courses designed to improve scores?

### **Bad memories**

In France and in the United States (but also in Italy, as a Dr. Strata explained in an interview to *Report* broadcast in 2004), there is ongoing research to develop drugs “erasing” bad memories. A drug formerly used as anti-hypertensive, propranolol, has been recently experimented on humans to check its efficacy against *post-traumatic stress disorders* (PTSD). The basic mechanism of this drug is supposed to be that

it acts on the amygdale, making it “insensitive” in the hours and days subsequent to the trauma, and inhibits the production of noradrenalin and cortisol, which help us to remember an event precisely.<sup>39</sup>

The idea is to preserve the factual details contained in a bad memory but to turn its emotional import off. Clearly this kind of treatment is very much in demand among those who work in that important occupational sector named “war”. It has been recognized since a very long time that to earn one's living by killing perfect strangers, and risking one's life in addition, for no other reason than that one has been ordered to do it is not exactly conducive to a good mental balance. The figures are terrifying, as regards the U.S. war veterans:

Eighteen American war veterans kill themselves every day. One thousand former soldiers receiving care from the Department of Veterans Affairs attempt suicide every month. More veterans are committing suicide than are dying in combat overseas.

These are statistics that most Americans don't know, because the Bush administration has refused to tell them. Since the start of the Iraq War, the government has tried to present it as a war without casualties. [...]

According to an April 2008 study by the Rand Corporation, 300,000 Iraq and Afghanistan war veterans currently suffer from post traumatic stress disorder or major depression. Another 320,000 suffer from traumatic brain injury, physical brain damage. A majority are not receiving help from the Pentagon and VA system which are more concerned with concealing unpleasant facts than they are with providing care.<sup>40</sup>

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<sup>39</sup> Sender 2006 (my translation).

<sup>40</sup> Of course these data would not have been disclosed without a lawsuit: «In fact, they never would have come to light were it not for a class action lawsuit brought by Veterans for Common Sense and Veterans United for Truth on behalf of the 1.7 million Americans who have served in Iraq and Afghanistan. The two groups allege the Department of Veterans Affairs has systematically denied mental health care and disability benefits to veterans returning from the conflict zones» (Glantz 2008).

No wonder, then, that a pharmacological fix should be conceived as the ideal solution for this epidemics:

"I'd take it in a second," said Sgt. Michael Walcott, an Iraq War veteran, referring to an experimental drug with the potential to target and erase traumatic memories.

Walcott, who served in a Balad-based transportation unit that regularly took mortar fire, now suffers from post-traumatic stress disorder. Since returning to the United States two years ago, he has been on antidepressants and in group therapy as he tries to put his life back together and heal from the psychological scars of war. "There are moments," he said, "when you just want be alone and don't want to deal with everyone telling you that you've changed."

There are many others like Walcott. The Army estimates that one in eight soldiers returning home from Iraq suffers from post-traumatic stress disorder. Symptoms of the disorder, once known as shell shock, include flashbacks, nightmares, feelings of detachment, irritability, trouble concentrating and sleeplessness.

In the list "sense of guilt" is absent. What is the "scientific" approach to traumas suffered by soldiers? An ordinary person would think that to remove the association of psychological traumas to wicked actions is the devil's recipe to increase the evil in the world. But scientists do not bother. Their way of seeing the issue is different, and can be outlined as: "here is an interesting neurological problem". Let us continue our quotation:

Much about why painful memories come back to haunt soldiers and those who live through other traumatic experiences remains unknown. Scientists say that is because little is known about how the brain stores and recalls memories.

But in their early efforts to understand the way in which short-term memories become long-term memories, researchers have discovered that certain drugs can interrupt that process. Those same drugs, they believe, can also be applied not just in the immediate aftermath of a traumatic event — like a mortar attack, rape or car accident — but years later, when an individual is still haunted by memories of event.

Now we are offered an impressive example of the interplay between committees of bioethics, funding agencies, and scientific research: «The President's Council on Bioethics has condemned memory-altering research». So we know that the former U.S. President G. W. Bush had his own Council on Bioethics, and a rather strict at that.

The National Institutes of Health, however, has funded some experiments that use propranolol for post-traumatic stress disorder treatment, and Pitman said he has received a grant from the Army to begin conducting similar research with Iraq veterans. [Goldman 2007]

One last point is worth mentioning. As I have said, propranolol has been "deviated" to a different use from the original one, but in fact it has been around for quite a long time. So a look is warranted at the list of recognized adverse effects:<sup>41</sup>

The following adverse events were observed and have been reported in patients using propranolol.  
CARDIOVASCULAR: Bradycardia; congestive heart failure; intensification of AV block; hypotension; paresthesia of hands; thrombocytopenic purpura; arterial insufficiency, usually of the Raynaud type.  
CENTRAL NERVOUS SYSTEM: Light-headedness, mental depression manifested by insomnia, lassitude, weakness, fatigue; catatonia; visual disturbances; hallucinations; vivid dreams; an acute reversible syndrome characterized by disorientation for time and place, short-term memory loss, emotional

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<sup>41</sup> [http://www.rxlist.com/cgi/generic/propran\\_ad.htm](http://www.rxlist.com/cgi/generic/propran_ad.htm)

lability, slightly clouded sensorium, and decreased performance on neuropsychometrics. For immediate-release formulations, fatigue, lethargy, and vivid dreams appear dose-related.

**GASTROINTESTINAL:** Nausea, vomiting, epigastric distress, abdominal cramping, diarrhea, constipation, mesenteric arterial thrombosis, ischemic colitis.

**ALLERGIC:** Hypersensitivity reactions, including anaphylactic/anaphylactoid reactions, pharyngitis and agranulocytosis; erythematous rash, fever combined with aching and sore throat; laryngospasm, and respiratory distress.

**RESPIRATORY:** Bronchospasm.

**HEMATOLOGIC:** Agranulocytosis, nonthrombocytopenic purpura, thrombocytopenic purpura.

**AUTOIMMUNE:** Systemic lupus erythematosus (SLE).

**SKIN AND MUCOUS MEMBRANES:** Stevens-Johnson Syndrome, toxic epidermal necrolysis, dry eyes, exfoliative dermatitis, erythema multiforme, urticaria, alopecia, SLE-like reactions, and psoriasiform rashes. Oculomucocutaneous syndrome involving the skin, serous membranes and conjunctivae reported for a beta blocker (practolol) have not been associated with propranolol.

**GENITOURINARY:** Male impotence; Peyronie's disease.

## The smoking gun

Most of the medical and pharmaceutical results (or counterproductive effects!) we have described are accompanied by experiments on living animals. I have in several occasions expressed in print my reasoned view that this methodology – i.e. using one or more animal species in order to find out what is the case *in still another animal species* – is scientifically untenable, and that historically has collected an incredibly high number of tragic failures. It has been extensively documented that even those who practice it do not take it seriously, although they accept to practice it as a means to enhance their own academic or professional standing. But reactionary scientism *needed* to put forward a method which could be presented to the misinformed majority as having a *prima facie* chance to solve the innumerable problems to the citizen's health that the capitalist system generates: vivisection (such is the historical name of this methodology), with its link to the ancient notion of sacrificing animals to the gods as a surrogate for human victims, was and remains particularly suitable for this purpose.

However, in this article I will limit myself to stress the indisputable historical fact that there have been and still there are many people around the world who hate the very idea of vivisection, because they think that it is awful to exploit sentient beings in such a systematically cynical and cruel fashion. Most of these people are unmoved by the (unfounded) pretence that by experimenting on animals wonderful cures for human illnesses are continually discovered.

One such person was “Mahatma” Gandhi, one of the really great men of 20<sup>th</sup> century. Answering a question posed by a postgraduate student, he wrote in 1925 (Gandhi 1999, vol. 33, p. 312):

I am not opposed to the progress of science as such. On the contrary, the scientific spirit of the West commands my admiration and, if that admiration is qualified, it is because the scientist of the West takes no note of God's lower creation. I abhor vivisection with my whole soul. I detest the unpardonable slaughter of innocent life in the name of science and humanity so-called, and all the scientists' discoveries stained with innocent blood I count of no consequence. If the circulation of blood theory could not have been discovered without vivisection the human kind could well have done without it. And I see the day clearly dawning when the honest scientist of the west will put limitations upon the present methods of pursuing knowledge. Future measurements will take note not only of the human family, but of all that lives and even as we are slowly but surely discovering that it is an error to suppose that Hindus can thrive upon the degradation of a fifth of themselves or that peoples of the west can rise or live upon the exploitation and degradation of the eastern and African nations, so shall we realise in the fullness of time, that our dominion over the lower order of creation is not for their slaughter, but for their benefit equally with ours. For I am as certain that they are endowed with a soul as that I am.

There are several other statements by Gandhi stressing the same point.<sup>42</sup> It seems obvious that those who make irruptions in laboratories to boycott this research activity would have received Gandhi's blessing.

The Animal Liberation Front is considered in the United States by the FBI to be the «number one domestic terrorist threat». But a new law, which Project Censorship has inserted among the top 25 most censored stories for 2008, prosecutes *as terrorism* much milder animalist protests:

The term “terrorism” has been dangerously expanded to include acts that interfere, or promote interference, with the operations of animal enterprises. The Animal Enterprise Terrorism Act (AETA), signed into law on November 27, 2006, broadens punishment present under the Animal Enterprises Protection Act (AEPA) of 1992. One hundred and sixty groups, including the National Lawyers' Guild, the Natural Resources Defense Council, the League of Humane Voters, Physicians' Committee for Responsible Medicine, and the New York City Bar Association, oppose this Act on grounds that its terminology is dangerously vague and poses a major conflict to the US Constitution.

The broad definition of an “animal enterprise,” for example, may encompass most US businesses: “any enterprise that uses or sells animals or animal products.” The phrase “loss of any real or personal property,” is elastic enough to include loss of projected profit. Concerns deepen as protections against “interference” extend to any “person or entity having a connection to, relationship with, or transactions with an animal enterprise.”

So it appears that to oppose what Gandhi considered «the unpardonable slaughter of innocent life in the name of science and humanity so-called» is today in the U.S. classified and accordingly prosecuted as a form of terrorism. It is hard to imagine, and yet it is true, that this happens in 2006 in the very country which had only 5 years earlier suffered the most famous act of *real* terrorism -- the attack on the World Trade Center in New York City on September 11, 2001.

No one can imagine in their wildest wishful thinking that the U.S. right-wing government was so harsh against animal-rightists because otherwise ill people would have been left without precious new drugs or treatments. And no one can suppose that it is out of love for science either, in a country where so many bills favouring creationism have been and are still being introduced.<sup>43</sup> The reason antivivisectionists are so feared is that their protests and affirmative actions are imperilling the covenant between science and corporations, by rejecting the angular stone of the house of (open-ended and deceptive) promises built by reactionary scientism to contrast criticism of the corporate destruction of environment and health.

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<sup>42</sup> For instance this is taken from *Hind Swaraj* (1909-1910), which occupies pp. 245-315 of Gandhi 1999, vol. 10: «Hospitals are institutions for propagating sin. men take less care of their bodies and immorality increases. European doctors are the worst of all. For the sake of a mistaken care of the human body, they kill annually thousands of animals. They practise vivisection. No religion sanctions it. All say that it is not necessary to take so many lives for the sake of our own bodies. [p. 278] 7. If a doctor, he will understand that no matter to what religion he belongs, it is better that bodies remain diseased rather than they are cured through the instrumentality of the diabolical vivisection that is practised in European schools of medicine. [p. 309]».

<sup>43</sup> «In the first three months of 2011, nine creationism-related bills have been introduced in seven states—that's more than in any year in recent memory [...]». The seven states are Texas, Kentucky, Florida, Tennessee, Oklahoma, New Mexico, and Missouri (Harkinson 2011).

## **Conclusion**

We have seen that the ideology guiding the development of a considerable part of contemporary technoscience is reactionary scientism, or the belief that science can make political unrest seem irrational thanks to technological intervention, thus avoiding a redefinition of the power relationships in society. It is the world (including the human body and mind) that must be changed and tinkered with, according to this ideology, lest the present social order were to be disturbed.

Reactionary scientism requires from researchers a rather definite social and psychological profile, characterized by subservience to hierarchy (both within and without the scientific community), and by an alienated sort of curiosity.

We have seen several examples of technological innovations, illustrating two related points: 1) it is doubtful whether technological innovation can in general be identified with progress, even from a strictly technical point of view; 2) in a society where work exploitation (including programmed mass unemployment) is the rule, technological innovation is normally used to ensure a tighter control on the citizens, even if it is deceptively advertised as apt to increase individual freedom.

The crucial issue of the political non-neutrality of science has been historically first submerged into scholasticism, and then into oblivion, and this has happened while the phenomenon itself -- that is, the dependence of scientific research on an agenda fixed by a transnational political and economical oligarchy -- has been constantly on the rise for decades. It is time for science to be the focus of a renewed political debate, to which scientists should participate by rethinking their role in a much more radical way than they have grown accustomed to in recent times.

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