NUCLEAR INNOVATION IN RISK SOCIETY

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ABSTRACT

Many tragic events in the past years made it very complex to affront the political problem of nuclear power exploited for pacific reasons. Although an applied engineering effort for improving the security in nuclear plant would be a solution, the scientific research on nuclear physics becomes more and more limited to a pure theoretical analysis. This led to a vicious circle that seems impossible to be broken. This paper briefly presents the historical background in which the fear for nuclear energy grew from and tries to explain this phenomenon from the point of view the well-known Ulrich Beck's Risk Society theory.

1. INTRODUCTION

The first thought that crosses your mind when you think of nuclear energy is probably related either to atomic bombs or to the Chernobyl disaster. The most common icons of the atomic power are likely the cooling towers of a nuclear plant (from which just water steam comes out) and the famous "atomic mushroom" that is the most manifest effect of a nuclear bomb explosion. The coexistence and the proximity of these two images in our association-based mind proves the widespread confusion on this matter. Even if the pacific exploiting of the nuclear power for electricity production is very far away from the military use of atomic bombs during war, that is done with the horrible aim of killing people in order to impose the supremacy of a nation, the two concepts seem to be mixed in a unique dangerous mixture made up of terrific diseases and terror.

2. FROM CHERNOBYL TO IRAQ WAR: SOME HISTORICAL FACTS

A preliminary investigation on this fact can lead to state that the reason of this nucleus' power "bad name" comes from the tragic events of Chernobyl reactor incident and the Hiroshima and Nagasaki atomic bombs. Let us take a quick look on the first of those events.

On the Friday evening of April 25, 1986, the scientists at Chernobyl-4 reactor prepared to run a test to see how long the turbines would keep spinning and producing power in a critical situation due to the shutdown of the electrical power supply. In order to do that, they disabled some important control systems, including the automatic shutdown safety mechanisms. At 1:00 AM on April 26, the flow of coolant water dropped and the temperature of the reactor core began to increase. The moderator of that Soviet designed reactor was constructed of graphite. Nowadays this models are outlaw because very dangerous: the graphite is likely to burn out when temperature is too high. That day in Chernobyl, once graphite started to burn, it was almost impossible to extinguish.

These facts show that the causes of the accident were a fool combination of human errors and imperfect technologies. In fact, that kind of experiment is clearly dangerous and should not be done in a real plant. Today's computing power lets the scientists use computer-based simulations rather than tests on effective plants, so this trial seems today even more foolish than in the past.

In the immediate aftermath of the explosion and fire, 187 people felt ill from acute radiation sickness; 31 of these died. In Italy, the exposure to radiation was similar to that given by a radiograph but less dangerous because diluted in a week. The prohibition of use of lettuce was only precautionary because the dose of radioac-

tive material was very low. But this government action was seen by the Italian society as a clear alarm bell that made anti-nuclear campaign start. Just one year after, on November 10, 1987, a so-called "abrogative referendum" imposed the shutting down of the four Italian nuclear power plants of Latina, Trino Vercellese, Caorso and Garigliano.

The real political meaning of that decision is still under dispute. Someone states that there were international interests against the Italian electricity production growing. When most of Italy was hit by a massive power cut on September 29, 2003 as a result of a malfunction of major supply lines from France, the debate on new power policies came back. Moreover, the controversial Iraq wars of 1991 and 2003 posed serious questions on the dependency of western countries on oil and the consequent worldwide political and economical instability (consider the frequent jumps of the oil barrel price).

These events pose in Italy as in the other countries the serious problem of using energy sources different from oil. How come the nuclear power is hardly considered in these debates? The reason is hidden in the great and often exaggerated widespread fear toward the atomic energy, seen as a global risk, too much dangerous to be taken. Beck theories can help us understand this point.

3. RISK SOCIETY AND NUCLEAR POWER

In [1] Ulrich Beck defines risk as a "systematic way of dealing with hazards and insecurities induced and introduced by modernization itself." Practically speaking, this means that today risks are taken by the politics, by the society itself. In the past cultural eras the risk was located in external and alien threats. Now it is self-produced by the modernization and fed by the society itself. The naturally occurring hazards (diseases, floods, etc.) were perceptible to our senses. Now they have been transformed in socially determined hazards, that are often "invisible or imperceptible, hence the need to measure risks in new ways," [2]. Nuclear power is a clear example of such new forms of risk. As noticed in [3], "in his reflections on Chernobyl and nuclear power in Risk Society, Ulrich Beck argued that our fears were not linked to any clear evidence that nuclear is more dangerous than other energy sources, but rather were the result of a generalized and perceived sense of risk. He said that the non-visible character of nuclear radiation meant that this perception of risk could become even more detached from the facts of the matter. In short, post-Chernobyl, nuclear power became a kind of metaphor for a sense of risk in Western society - and nuclear reactors came to be seen as a deadly threat lurking within our own societies."

In [4], Beck underlines this strong role of atomic energy in the shift from the old to the new forms of risk. He notices that "with the past decisions on nuclear energy and our contemporary decisions on the use of genetic technology, human genetics, nanotechnology, computer sciences and so forth, we set off unpredictable, uncontrollable and incommunicable consequences that endanger life on earth." Moreover, Beck points out the active role of politicians in the creation of the modern concept of risk, including the September 11, 2001 terrorist attacks to the World Trade Center in New York and the U.S. Department of Defense headquarters, the Pentagon, in Virginia: "the novelty of the world risk society lies in the fact that we, with our civilizing decisions, cause global consequences that trigger problems and dangers that radically contradict the institutionalized language and promises of the authorities in catastrophic cases highlighted worldwide (like in Chernobyl and now in the terrorist attacks in New York and Washington). [...] The outbreak of global terrorism resembles a Chernobyl of globalization".

4. BEHIND THE FEAR

According to the Auguste Comte Positivist movement (introduced by the beginning of the 18th century), the only authentic knowledge is scientific knowledge. This approach to the philosophy of science deriving from Enlightenment thinkers like Pierre-Simon Laplace (and many others), implied an unconditioned acceptance of the science and its derivatives, including the technology innovation. When did this equilibrium begin to decline? In the late 18th century manual labour started to being replaced by the manufacture of machinery: this was the main feature of the first industrial revolution. The adoption of a new industry-based economic architecture led to a number of social problems within the newly developed working class. This can be probably considered as the seed of what will become the latent fear of technology innovation.

With the second industrial revolution this trend continued. The introduction of the assembly line for the production of consumer goods made the people feel as

trapped in the cogwheels of this new technology-driven world. This condition has been brilliantly parodied by Charlie Chaplin in "Modern Time" (1936).

The man felt that this increasing technological saturation would have make him self-destruct very soon. The nuclear bomb will have utterly fitted this frightening scenario. Now it would be very interesting to observe as an Italian author of the beginning 20th century foresaw something similar to the main nuclear age nightmare: the atomic bomb.

Italo Svevo[1] never heard about atomic bomb. He lived in a period of great political and social turmoil characterized, for instance, by the first world war and the birth of psychoanalysis (Sigmund Freud published his "Interpretation of dreams" in 1900). His subtle mind let him become an unconscious prophet of what will be the fear against the nuclear power. As we saw above, the second industrial revolution started to undermine the confidence of the man in the machines. Svevo expresses the widespread dread of technology, thought as a self-destruction weapon ready to explode and also as a "social disease," caused by the growing human greed. In the last pages of its masterpiece, "La Coscienza di Zeno," [5], he described a modern version of the "apocalypse": a man "slightly more diseased than the others" brings the most powerful explosive never seen in the center of the earth where "its effect would have been the greatest": a "huge explosion" cancels in a little while the entire world and all of its diseases. This significant words are reported below in the original version:

> "Forse traverso una catastrofe inaudita prodotta dagli ordigni ritorneremo alla salute. Quando i gas velenosi non basteranno più, un uomo fatto come tutti gli altri, nel segreto di una stanza di questo mondo, inventerà un esplosivo incomparabile, in confronto al quale gli esplosivi attualmente esistenti saranno considerati quali innocui giocattoli. Ed un altro uomo fatto anche lui come tutti gli altri, ma degli altri un po' più ammalato, ruberà tale esplosivo e s'arrampicherà al centro della terra per porlo nel punto ove il suo effetto potrà essere il massimo. Ci sarà un'esplosione enorme che nessuno udrà e la terra ritornata alla forma di nebulosa errerà nei cieli priva di parassiti e di malattie".

These words are enormously meaningful. They are a colorful description of what will happen in 22 years! The atomic bomb with its self-destructive power is foreseen in advance and that shows how the seed of the global fear of the fast innovation was already planted.

5. CONCLUSION

In this paper we briefly analyzed the social impact of the nuclear energy to the society and to the development of a generalized dread of the powerful technologies. We saw as Beck often uses the atomic bomb and the Chernobyl accident as examples for explaining his "risk society" theory. The historical background in which this reaction of the man against the machines in particular and the great innovations grew up has been shortly described. At last, we analyzed the word of an Italian 19th century novelist trying to highlight how he reported an unconscious inkling of his society about the self-destruction power brought by deep innovations.

6. REFERENCES

[1] U. Beck, "Risk Society, Towards a New Modernity," Sage Publications, 1992 (original 1982).

[2] R. Dirvem, R. Frank, M. Putz, "Cognitive Models in Language and Thought," Walter de Gruyter, 2003.

[3] B. O'Neill, "Exploiting our nuclear fears," Spiked, 14 November 2005.

[4] U. Beck, "The Silence of Words and Political Dynamics in the World Risk Society," Logos, vol. 1, is. 4, 2002.

[5] I. Svevo, "La coscienza di Zeno," Einaudi Tascabili, 2001.

[1] Aron Ettore Schmitz, better known as Italo Svevo, was an Italian author of novels, plays, and short stories. His masterpiece, the classic novel "La Coscienza di Zeno", [5], (rendered as "Confessions of Zeno", or "Conscience of Zeno") was self-published in 1923.