

# Scientists, bioethics and democracy: the Italian case and its meanings

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In June 2005, Italy held a referendum on repealing the law on medically assisted fertilization (Law 40/2004), which limits access to artificial reproduction to infertile couples, and prohibits the donation of gametes, the cryopreservation of embryos, preimplantation genetic diagnosis (PDG), and research on human embryos. The referendum was invalidated, and the law remained unchanged. The Italian political and bioethical debate on assisted reproduction was manipulated by the Catholic Church, which distorted scientific data and issues at stake with the help of Catholic politicians and bioethicists. What happened in Italy shows that some perverse socio-cultural and political mechanisms are spreading the absurd and anti-historical view that scientific and technological advancements are threatening democracy and personal freedom. Scientists should not only contrast the political attempts at limiting freedom of scientific research, but also tell politicians, humanists and citizens that the invention of Western science with its view of scientific community as an "open society", contributed and still contributes, through scientific education, to the construction and maintaining of the moral and political values underlying Western democracies.

aware, and make Western citizens aware, that, for historical and other reasons depending on the behavioural predispositions of our species, freedom of scientific research and the advancement of scientific knowledge and methods are among the essential requisites (together with others, of course) for the democratic functioning of political and social systems.

## MAYBE SOMETHING IS ROTTEN IN ITALY

On 12 and 13 June 2005, Italian citizens were called to vote for the repeal of the law on assisted reproduction (Law Number 40 of 19 February 2004), which limits access to assisted reproductive techniques to infertile couples, prohibits gamete donation, use of gametes, cryopreservation of embryos, preimplantation diagnosis and any kind of research on human embryos. However, the vote was declared void because the quorum was not reached. The Italian Constitution establishes that a referendum is valid only when >50% of the people entitled to vote cast their ballot. In fact, only 25.9% of Italians voted.

The Italian scientific community actively participated in the debate on the approval of Law Number 40/2004 and, above all, in the political and cultural discussion between supporters and opponents of the referendum and/or repeal of the law. As has happened in Switzerland for the referendums on human embryonic stem cell research (2004) and genetically modified organisms (GMOs) (2005), and in California for the vote on proposition 71 (2005), in Italy too, scientists found themselves at the centre of heated controversies because of the idea that biotechnologies and genetics pose a threat to mankind. So they had to confront the social and political perception and elaboration of science—that is, they had to deal with difficulties in communicating rationally and pragmatically, among themselves and with society, about ethically controversial issues, the objectives of research and the reliability of scientific research. In practice, they tried to avoid the political exploitation of controversial aspects of scientific research and its practical applications, from both a cognitive and a risk assessment point of view. Indeed, such exploitation for the purposes of propaganda would have made it impossible to elaborate effective policies aimed at finding practical solutions to the problems, or at least at avoiding the creation of new, even more serious, issues.

A disturbing misrepresentation is being spread in the Western world. It is the idea that science poses threats to democracy and personal freedom. This misrepresentation paves the way to the unbelievable and paradoxical claim of confessional ethics, which considers religions to be the main cultural and political defenders of humanity under the concentric attacks of technosciences. This kind of position is voiced in most Western countries in debates on the social impact and ethical implications of biotechnologies. Luckily, it normally has little or no influence on political decisions. In Italy, however, this position has become prominent and has influenced a series of legislative choices aimed at limiting freedom of scientific research and individual freedom at the same time.

This article describes what has happened in Italy in the past few years, starting from the referendum aimed at changing the law on assisted reproduction enacted in 2004. On the basis of the Italian events, and starting from historical and philosophical considerations on the social role of science, it is argued that the scientific community needs to change its attitude with respect to the public perception of science. Scientists must become

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**Abbreviation:** GMO, genetically modified organism

In Italy, some rather peculiar choices have been made in the field of science policy in the past few years. Actually, there are no policies, but only political controversies over science. To better understand current events, it should be taken into account that in the 1960s, some Italian scientists and research managers, such as Adriano Buzzati-Traverso and Felice Ippolito, tried to introduce meritocratic criteria and a peer-review process in the country, in order to avoid any favouritism in science policy choices. However, their efforts were blocked by politicians and university professors, and the research and academic system developed in a self-referential way. Scientific research became increasingly dependent on politics, owing to a financing and recruitment system that is mainly based on a network of affiliations and contacts in which people exchange favours to gain more prestige and power.

As a consequence, the Italian parties began to enlist scientists as experts or to promote them as outstanding personalities on the basis of their political ideas and acceptance of a certain political and cultural view of science, rather than only on the basis of their competences. Thus, the Italian parties prepared the conditions to exploit scientists and science for their own purposes. All the defects of this system have become apparent in the past 10 years through a series of emblematic episodes.

Let me ask how many democratic countries you know where scientists have felt the need to publicly appeal to the government, to politicians and to the whole country for freedom of research? This had happened in some totalitarian regimes, where the scientists who did not agree to adapt their scientific ideas to the dominant ideology were often discriminated against and even jailed or killed. But to my knowledge, Italy is the only modern democracy where this has occurred. It is true that in the USA the scientific community has recently complained and addressed public letters and reports to the Bush administration to remind them of the duty to respect scientific objectivity. But, to my knowledge, no legislative action has significantly interfered with the freedom of scientists to carry out advanced research.

In Italy instead, a rather unbelievable event for a democratic country occurred. Not long ago, in 2000, the daily newspaper *Il Sole 24 Ore* published an appeal against the then Minister of Agriculture Pecoraro Scanio, who had decided to ban research on GMOs for food and agriculture. The appeal was signed by the most important Italian researchers. It was then reported in *Nature* and *Science* and it was also signed by thousands of foreign scientists. There was also a demonstration in Rome. The political world poured a lot of oil on troubled waters, and tried to reassure everybody in view of the impending elections. Moreover, the surveys showed that the vast majority of Italians were against GMOs, which is still the case today.

The episode of the appeal came after two equally serious attacks on the freedom of scientific research. In 1997–8, in Italy, there was the famous Di Bella affair. Di Bella was an old-fashioned physiologist who had never published anything scientifically remarkable, and who claimed to cure cancer with somatostatin. Thanks to a well-planned campaign involving all the most important anchormen of Italian television (Bruno Vespa, Michele Santoro, Enrico Mentana and Maurizio Costanzo), and because of the political exploitation of the fact under the slogan “freedom of therapy”, Di Bella was transformed into a hero of a gentle and compassionate medicine. His figure was juxtaposed with clinical oncologists, who would be so “inhuman” as to use devastating chemotherapies and radiotherapies and who would be so “insensitive” to patients’ requests. Why should these oncologists be so strict and always require clinical evidence of the efficacy of other treatments? In brief, a pseudotherapy that was not even worth considering became the object of a bipartisan

vote: the Italian Parliament disregarded the opinion of all oncologists and voted—a unique case in the world, I think—under the supervision of an international commission. The Italian politicians implicitly declared that they did not trust our internationally recognised scientists and backed the theory of the plot against Di Bella. A clinical experiment was carried out, and some Italian citizens are likely to have died prematurely as a result.

At the same time, in 1997, a ban on animal cloning was introduced in Italy. It lasted for >5 years. A ban on human cloning is understandable, but why a ban on animal cloning? The reasons given by the Ministry of Health to impose and uphold such a ban were ridiculous: the justification was simply the fear that animal cloning would be the preliminary stage towards human cloning. The consequences were serious and comical at the same time. For example, Cesare Galli, a veterinary surgeon from Cremona, had to go through a series of police inspections because he was conducting research for the cloning of the first bull, Galileo. Even Galileo was temporarily seized by the police. So once again, the name Galileo became the symbol of the opposition to the political and religious repression of scientific freedom.

The following are other episodes that have occurred in Italy over the past 5 years, in addition to the approval of the law on assisted reproduction (Number 40/2004):

- The last Minister of Agriculture, Gianni Alemanno, has continued the boycott of biotechnological research in the food and agriculture sector. Apart from the positions of the Minister and of right- and left-wing environmentalists, the fact that the modern political class of an economically advanced country falls prey to irrational fears nourished by ignorance and fanaticism is outrageous. The European Union has invested €70 million (£47.87 million, \$93.30 million) in research to demonstrate what was already known—that is, that GMOs are not dangerous. However, despite that drain—paid for with our taxes—politicians do not want to accept the consequences of those findings for demagogic reasons.
- A political commissioner removed one of the most important Italian oncologists and geneticists, Lucio Luzzatto, from the position of scientific director of a biomedical research institute. The pretext for doing so was that Luzzatto worked as an adviser to Sloan Kettering. When this occurred, the Ministry of Education and University and the Ministry of Health did nothing to defend the researcher.
- A school reform has reduced the number of hours of science lessons and has set some learning objectives for students that are tragically inadequate and outdated with respect to scientific content and the epistemology of learning, not to mention the ridiculous scandal about the teaching of biological evolution. Perhaps believing themselves to be in the USA, some tried to eliminate the teaching of evolution in primary schools. After protests from the scientific community, a committee of wise men (including two Nobel Prize laureates), rather than experts, was set up to decide how to reintroduce evolution in the curricula, thus giving the impression that evolution is a dangerous topic. This would be something to laugh at, if it were not clear that the government of a democratic country misused and distorted its function.

These facts should seriously worry the politicians who really care about the health of Italian democracy. Indeed, scientific freedom and freedom of teaching are fundamental indicators of the status of individual freedoms in a country. However, Italian scientists, politicians and intellectuals and also all the scientists

and people all over the world, who care about science and its cultural, economic and political role in general, should worry about what is happening in Italy. In the second part of this article, I elaborate some considerations deriving from the Italian case.

## SCIENCE AND DEMOCRACY

In Western, scientifically advanced countries, scientific communities are trying to keep the opponents of science at bay while being convinced that this period of anti-scientific folly will come to an end. In particular, scientists believe that it is enough to improve scientific literacy to effect a change in the situation. Indeed, scientists also think that freedom of thought and expression, and hence freedom of scientific research, have been achieved for good in the Western world. There would be no need to worry too much about the cultural discrediting of science in Western societies, which is also due to the spreading of the cultural relativism and constructivism that infuses humanities. In the end, no one, not even the most extreme relativists, would be ready to give up the benefits provided by science and technology. After all, they also need to take antibiotics or to use the internet.

The scientific community should begin to realise that, from a historical point of view, and hence in terms of cultural premises, the achievement of civil freedoms came after the revolution of thought brought about by the invention of modern science. Hence, today, asserting the rationality of the scientific approach and defending science and freedom of research is equal to defending individual freedoms tout court—that is, democracy. Today the values of democracy are being exploited to distort science and its public perception. But in this way the grave of democracy itself is being dug. The fathers of modern democracy understood that scientific culture and education are the source of the fundamental values of democratic life. This also means that promoting scientific education and culture—that is, exporting science—is probably a much more effective, as well as less violent way, to spread well-being and democracy in the countries where they are still lacking.

Such a change in the strategy adopted by scientists in the public debate is advisable for three main reasons. Firstly, because history itself has shown that freedom of scientific research has been the most important cultural source of the modern ideas of democracy and a lay state. Secondly, because it is necessary to react against the political manipulation and censorship of science, which exploit the bioethical distortions and ambiguities of precautionary reasoning, portraying scientists as anti-democratic. Finally, because it is essential to strengthen critical thought—that is, the intellectual background of scientists and the internal control systems of the validity of scientific discoveries. This is necessary to prevent the inner productive force of technologies from leading to the development of a merely technology-oriented, dogmatic science, which would be favoured also in non-democratic countries. Indeed, what is happening in some Asian countries shows that merely technology-oriented science can develop very effectively also in political systems that do not guarantee individual freedom.

When honestly analysing the relationship between science and society from a historical point of view, it is clear that science and its technological applications have freed a significant portion of humanity from ignorance, poverty and disease. This seems to be recognised even today, at least in part—but evidently it is not highly valued. Most importantly, at a political and social level, no one seems to understand that, to preserve what has been achieved so far, scientific research needs to keep advancing. It should not be halted. Instead, just

like the Red Queen of *Alice in Wonderland*, who has to run to remain in the same place and to run twice as fast to move elsewhere, science has to proceed more and more rapidly to ensure a steady increase in human well-being.

Considering science to be a threat and taking political decisions aimed at limiting freedom of research and the use of advanced technologies leads to harmful consequences. The most serious consequences can go beyond a lower productivity of science and technology and even lead to a reduction of civic sense in the population. Indeed, scientific education has a key role in the preservation and development of democracy.

The political world and Western culture, in general, cannot ignore a historical fact—that is, that the advent of modern sciences and technologies has provided human society with much more than their extraordinary cognitive and practical achievements. Above all, modern sciences and technologies have defined a method to exchange views and ideas with others. This method, based on respect for all individuals and their ideas, has led to the appreciation of individual freedom and to the development of law and political thinking.

The idea that science poses a threat to democracy has been supported with doubtful and sometimes obscurantist arguments, even by famous philosophers such as Jürgen Habermas and Ralph Dahrendorf. This absurdity was denounced about 20 years ago by Gerald Holton, but, in fact, hardly anybody listened to his alarm. In 1981, Holton gave his Jefferson Lecture, in which he demonstrated that Thomas Jefferson's liberal political ideas and dynamic notion of democracy also derived from his participation in the scientific debate. Holton recalled that in 1778 Jefferson proposed the Bill for the More General Diffusion of Knowledge, based on the idea that the broad diffusion of liberal education is necessary to avoid any degeneration of the political power in a society that guarantees the exercise of natural rights to individuals.<sup>1</sup>

Several studies on the cultural impact of the 17th century scientific revolution have demonstrated that the birth of modern science challenged the previous elitist and hermetic notion of knowledge. In the 17th century, while Europe was being ravaged by religious wars, the so-called “natural philosophers” created several societies based on mutual respect, which they tried to free from any theological and political interference. The first society of this kind was founded in Italy, the “Accademia Nazionale dei Lincei”, whose constitution banned “any controversy other than naturalistic and mathematical” and removed “all political matters”.<sup>2</sup>

The debate among members of the initial scientific societies was based on tolerance and civil respect, as well as on the refusal of the principle of authority. They followed a critical, rather than an absolutist, approach. They found out that the truth of a thesis does not derive either from authority or from the sociopolitical status of its proponent, but only from factual evidence and from the logical coherence of argumentation.

Faced with the present, ridiculous attempts to juxtapose the idea of an “intelligent design” with Charles Darwin's explanation of evolution, it should be noted that four centuries ago scientists argued that science should not use “concealing” expressions, as hermetics did, but rather explain what is hidden. The invention of a scientific method based on conjecture and refutation set, for the first time, the conditions for appreciating that all men are equal. It was proved that holding that reason can be found entirely in each person was not just mere speculation. Hence, all human beings have comparable intellectual skills, and no groups of people can be considered superior or inferior to others.

The scientists' communication style also becomes the term of comparison to appreciate the value of intellectual honesty. As held by Francis Bacon, such intellectual honesty emerged in the

transparency through which men like Galileo Galilei progressively gave an account of the results of every single stage of their research. The liberal principles of tolerance and universalism of human values were for the first time institutionalised in scientific societies. In England, The Royal Society freely admitted men of different religions, countries and professions. Its members were not committed to elaborating an English, Scottish, Irish, Papist or Protestant philosophy, but a philosophy of mankind. To guarantee continuity of the Society, they mainly tried to free it from the contrivances, orientations and passions of sects, to transform it into an instrument for mankind to gain control over things, as well as over human judgements.<sup>2</sup>

I would like to reassure all those who know the historiography of modern science that I do not want to minimise the role of Puritan Protestantism. Indeed, Robert Merton and Charles Webster have demonstrated that Puritanism played a key role in making British society embrace the ideals of Baconian experimental science, and hence in favouring the institutionalisation of science. But in the right socioeconomic conditions, the experimental method demolished once and for all the idea that dogmatism and repressive authoritarianism are the most effective human ways to resolve disputes.

When we recognise the advantages of being free to discuss everything and of not considering freedom of thought as an anomaly to retrieve, we should also recognise something that the historians of political thinking and most philosophers tend to ignore—that is, the role of science. They also tend to overlook that in all totalitarian regimes, science has been censored and exploited in order to pursue several kinds of illiberal plans.

Science and democracy are not natural needs. They are human inventions, the products of a social evolution through cultural and economic processes. The political exploitation and censorship of science endanger democracy itself. Hence, scientists are called to protect not just scientific freedom, in order to guarantee the survival of science in society, they also have a higher duty, as they are called to safeguard the cultural conditions for the survival of democracy itself.

It is not possible to list all historical events that confirm the role of free science in the development of human well-being and individual freedoms in a democratic framework. However, it should be acknowledged that in the past 50 years, parallel to the most significant basic and technical developments of biological sciences, a concrete factor has contributed to worsening the communication problems between the scientific world and society. As held by many epistemologists and scientists such as Lewis Wolpert, these difficulties are because of the unnatural nature of science. The factor that has worsened such communication problems in the past few years is bioethics.

Despite the intentions of the inventor of the term bioethics, Van R Potter, an oncologist, has not built a bridge to the future. On the contrary, it has strengthened the suspicion of science. It has certainly increased the patients' freedom of choice, but not always and everywhere. In any case, it has neither improved their perception of science, nor has it clarified that the scientific method and culture are more effective in solving problems than any other form of culture—humanistic or religious. On the contrary, bioethics helps to reduce science to technology, because it tries to define everything in terms of procedures and protocols, as if it were possible to define, a priori, a protocol about how to make a scientific discovery or about how to foresee the findings of a study with absolute certainty. In short, bioethics is suffocating the creativity of researchers in the biomedical field, and is seriously limiting the productivity of clinical research.<sup>3</sup>

I do not want to generalise too much. However, most cases of political censorship and manipulation of biosciences, as well as the limitations on access to effective assisted reproductive techniques in Italy, are due to the excessive political and cultural power of bioethics, in contrast to the inner political and cultural weakness of the scientific community.

What should be done? In the past 30 years, in the most scientifically advanced countries, scientific communities have adopted different communication strategies to influence public opinion about the social role of science and to guarantee the necessary political conditions to carry out research. The results of the different experiences are not easy to interpret. How to proceed to improve perception of science and scientific literacy, in order to promote a better active citizenship when political choices have to be taken, is still unclear.

It has been about 20 years since the birth of the British movement for the "public understanding of science", which helped to increase the opportunities and occasions for the dissemination and communication of science. But it seems that the social perception of science has not improved, also because there has only been a dissemination of notions and a display of technological wonders. There has been no communication and explanation of the intellectually liberating character of the scientific way of thinking. The implications of scientific knowledge for the most common religious and cultural beliefs have not been communicated beyond intellectual elites and in schools. Today, in schools, pupils only learn some scientific notions and their practical applications. They are hardly ever informed about the theoretical and methodological premises of research and the cultural, ethical and social implications of certain discoveries.

Empirical studies and, indirectly, choices in politically controversial fields, show that the most critical and suspicious attitudes towards science and technological innovations emerge in the most advanced democracies, which guarantee more economic prosperity and civil rights.<sup>4</sup> On the other hand, we have all seen that in Asia today science and technology progress much more rapidly in countries that are not really democratic—for example, in China. Can the economic and social differences explain the different attitude of European citizens towards science and technology? Are there any advantages for science, which is now often the object of moral political controversies, in less democratic countries?

It is now time to consider these questions and to think about the evolution of science with respect to the political systems and cultural conditions in which it operates. I remember a discussion on Western science and its chances of survival in front of a mounting wave of irrationalism. The discussion was held a few years ago in the institute directed by the famous American scientist and Nobel Prize laureate Gerald Edelman. He argued that an aspect to be considered is that today science has become so efficient that even a not very intelligent person can make a fundamental discovery. I have always considered that original answer as a good description of the condition of uncertainty which science has experienced in the past few decades in the free world—a freedom which our species achieved exactly, thanks to science and technology.

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