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outlook

Science under politics

An Italian nightmare

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The second half of the twentieth century has seen the relationship between society, politics and science become increasingly complex and controversial. Particularly in democratic countries—where the application of scientific research and the diffusion of knowledge have contributed to a significant increase in the well-being of citizens—scientists have had to face interference from political, religious and ideological interest groups. Even the seemingly powerful scientific community in the USA was affected by an 'epidemic of politics' under the administration of President George W. Bush. This 'infection of science' was characterized by inappropriate political meddling in research driven by political prejudices and religious arguments, especially in more controversial research fields. During his tenure, Bush established science and health policies that went against expert advice, and in several cases made controversial appointments to key positions in scientific and health agencies (Kennedy, 2003; Mooney, 2005). This was all the more shocking because science and scientists in the USA have generally enjoyed a great deal of political independence.

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Such 'epidemics of politics' are not exclusive to the USA; political interference in scientific research and its applications is endemic in many countries. Such meddling can take various forms depending on the country in question, the different democratic decision-making processes at work, the relative influences of politics, economics and society on the scientific community and, to some extent, the level of scientific literacy of the public. During the past two decades, science in Italy has been suffering from a particularly severe form of political interference that we believe deserves international consideration, if only to act as a warning for other countries.

Italian science has often found itself entangled in political controversy. After the unification of the country in 1861, during the last two decades of the nineteenth century and the first decade of the twentieth century, Italian scientists actively participated in political debates about how to improve and integrate the fragments of Italian society, culture, economy, health, and so on. But from the beginning, they often confused political battles with their professional status and/or scientific disagreements (Casella *et al*, 2000). Throughout the fascist era, the scientific community—similarly to the rest of the country—was subjected to the rule of Benito Mussolini's regime (Maiocchi, 2004). After the Second World War, both Catholic and Marxist ideologies prevented the rise of an autonomous scientific community, so Italian scientists had and still have little cultural or political influence.

Yet Italians are far from hostile to science; they follow advances in research and technology with keen interest and expectation, as shown by a fairly recent survey (Eurobarometer, 2005a,b). Politicians, influential intellectuals and lobbyists who oppose research and innovation for various reasons have therefore adopted a strategy of trying to manipulate and censor facts. Rather than confronting the scientific evidence directly, they maintain a high degree of political control over scientific research and its applications. As a result, the validity of scientific evidence has become optional and its use arbitrary in public and political discussions.

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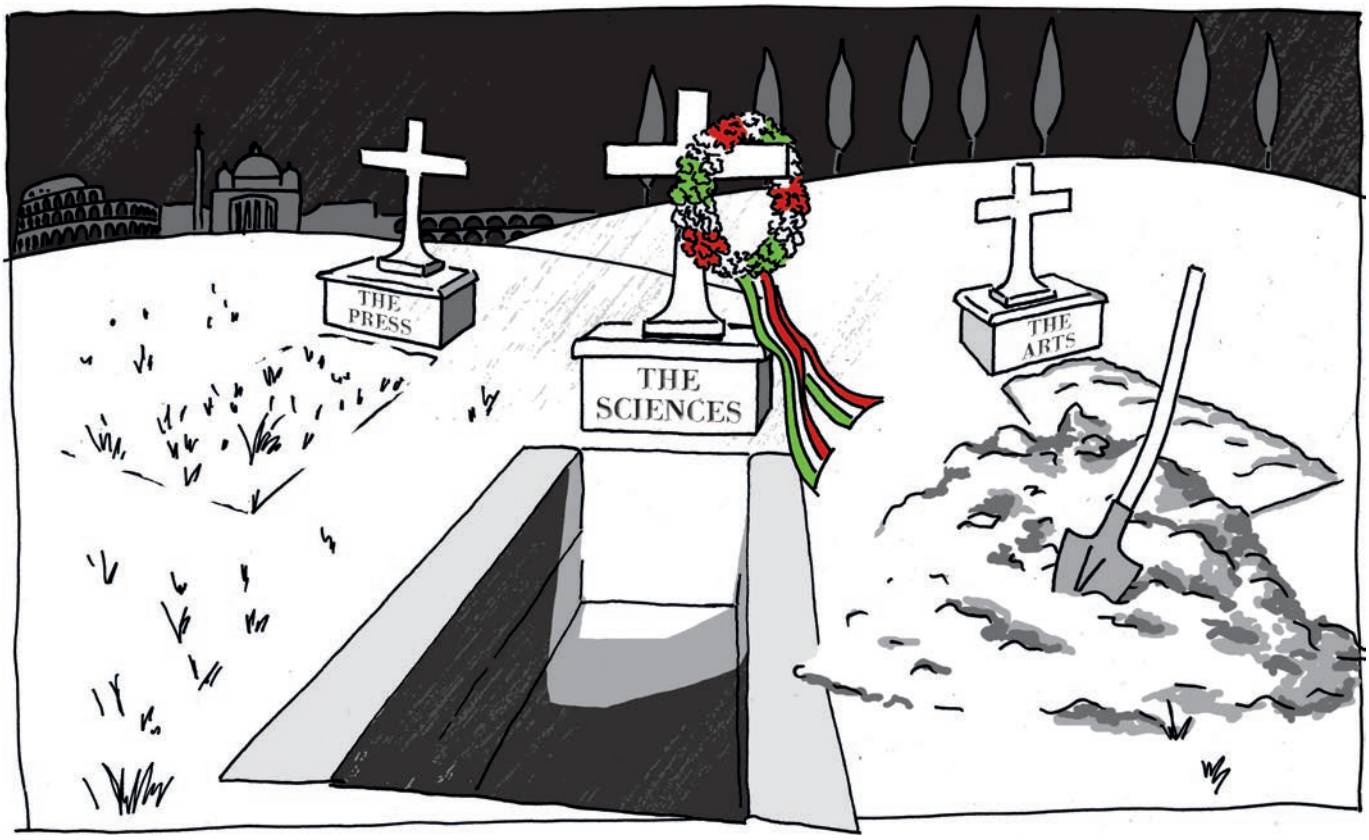
This situation has been virtually *de rigueur* since the advent of Silvio Berlusconi in 1994, although it would be unfair to say that the current Italian Prime Minister is the main culprit. Indeed, many factors have acted together to make Italian science prey to political influence, including the predominance of non-transparent and nepotistic approaches to the public funding of research, the chronic cultural and political impotence of Italian scientists and the waning professional quality of the national political and intellectual elites (Corbellini, 2009). The examples provided here should illustrate the weaknesses of the Italian scientific community and how politicians—irrespective of their political colour—have been reluctant to understand and respect the value of scientific procedures and evidence.

In 1997, the Italian media regaled its readers with stories about a new and supposedly effective treatment for cancer, which had been developed by the physician and professor Luigi Di Bella, then at the University of Modena. The media storm was so convincing that a judge in Apulia ordered the local public health authorities to provide patients with the drug cocktail required for the therapy, despite the absence of a scientific basis for the claims or clinical evidence for the efficacy of the treatment (Remuzzi & Schieppati, 1999). The Di Bella multi-therapy (DBM)—as the treatment was called—soon became a topic for political wrangling between the members of right-wing



parties who supported the treatment, and the more sceptical, ruling centre-left party. This continued until the health ministry, backed by prominent Italian oncologists, eventually agreed to sponsor a controversial clinical trial. This exposed the Italian medical community to international scorn (Müllner, 1999) and highlighted the lack of accurate and factual scientific information in the public debate (Passalacqua *et al*, 1999).

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In late 2000 and early 2001, Italian plant biotechnologists were up in arms over a decree proposed by the centre-left government's agricultural ministry that would have banned funding for any plant research involving genetic modification (Frank, 2000). The decree was eventually withdrawn as the result of a political move to prevent the opposition from exploiting the dispute. However, when the centre-right coalition came to power in May 2001, the new Ministry of Agriculture proved equally averse to the use of genetically modified plants. As a result, research in the field of plant genetics in Italy remains virtually devoid of public funding and a series of byzantine regulations still prevent Italian farmers from using genetically modified crops, despite the lack of scientific evidence that they are dangerous. In fact, the law does not explicitly ban their use and they are routinely imported as livestock feed.

Striking examples of the manipulation and censorship of science were seen during the fierce debate that followed the introduction of Law 40—which was issued in 2004 with the apparent unofficial support of the Catholic Church—that limited the use of *in vitro* fertilization (IVF) procedures and banned research on human embryos. According to this law, each IVF procedure is allowed to create only three embryos, all of which must be implanted into the recipient mother (Boggio, 2005). This is in contrast to international guidelines on clinical practice (www.eshre.eu). Law 40 also prohibits pre-implantation diagnosis and the cryopreservation of embryos, as well as the generation of embryonic stem-cell lines, even when these are obtained from superfluous embryos that were created before the law was enforced and are destined to be stored frozen indefinitely.

In 2005, patient advocacy groups and left parties called for a referendum to abrogate Law 40. This ignited a fierce dispute with Catholic politicians, backed by a handful of scientists, who called on voters to boycott the referendum and claimed that the law was scientifically sound and improved safety for patients (Vogel, 2005; Boggio & Corbellini, 2009). Interestingly, rather than attempting to justify their position with ethical, legal, scientific or religious arguments, the supporters of Law 40 often adopted the strategy of denigrating scientific research and facts and spreading misleading information (Corbellini, 2006). They claimed, for example, that pre-implantation diagnosis did not work, that the cryopreservation of embryos was not clinically necessary and that research with embryonic stem cells was pointless because adult stem cells had been proven to be effective for treating dozens of diseases (Corbellini, 2007).

According to the Italian Constitution, the referendum was invalidated as less than 50%

of the electorate voted. The proportion of Italian citizens who usually vote in a referendum is about 60%, and analysis shows that most non-voters decided not to participate because they did not understand what was at stake (Corbellini, 2006). Six years later, Law 40 has finally been revised by a series of decisions at Italy's Constitutional Court and now, in some circumstances, pre-implantation diagnosis and the cryopreservation of embryos is permitted.

The preceding examples have highlighted how Italian politicians and special interest groups have stifled scientific progress and liberty within Italy. The following examples highlight how political meddling and influence are jeopardizing the competitiveness of Italian research on the international stage.

The teaching of evolution came frighteningly close to being scrapped from primary school curricula in Italy under a reform instigated by the 2003 centre-right government. It was reinstated only when the issue led to a political brawl between the Cabinet and the left-wing press (Frazzetto, 2004).

Italy lacks an independent agency for research and also compulsory, transparent and unbiased selection processes

The same right-wing government was also opposed to the creation of the European Research Council (ERC), arguing that the agency would be too independent from political control (ftp://ftp.cordis.europa.eu/pub/italy/docs/positionfp7_it.pdf). This is not surprising for a country in which the chairs of public research institutions and the scientific directors of research hospitals are appointed by the government (with a few notable exceptions, see Anon, 2008) and where funding is often granted in a top-down manner by governmental decree to specific institutes, without public calls or peer review (Margottini, 2008).

Even when funding is subject to peer review, cases in which money ends up at laboratories that are directly affiliated with members of the evaluating commission are, unfortunately, not the exception (Italian Parliament, 2006), which highlights the widespread conflicts of interest that are allowed. Italy lacks both an independent agency for research and compulsory, transparent and unbiased selection processes. As such, the guidelines and criteria that determine which research activities receive public funding are often established directly by the respective ministries, thereby increasing the risk of political interference. This was the case in 2007, when peers of Barbara Ensoli—then at the Istituto Superiore di Sanità (ISS) in Rome—felt that she was receiving a disproportionate amount of government funding, without peer review and in spite of the fact that her work on an HIV/AIDS vaccine was, at least to some scientists, unconvincing (Cohen, 2007).

Conversely, in 2009 the Ministry of Health arbitrarily excluded projects involving human embryonic stem-cell lines from a call for proposals on stem-cell research funding—one of the authors of this article, Elena Cattaneo, is now appealing in court against the ministry's decision (Cattaneo *et al*, 2010). Further, in October 2010 the Italian Ministry of Health decided, *motu proprio,* to grant €3 million to a private foundation that claimed to have created adult human stem cells that can be tested in patients with neurodegenerative diseases. This happened in spite of the Ministry's declarations a few months previously that allocation of public money for research should be subject to peer review.

If Italian scientists want to have a leading role in shaping society and the future, they must demand, reinstate and maintain sound principles of transparency and competitiveness in the allocation of public funding. This means that individual researchers—who enjoy the ephemeral benefits gained by deference to politicians and the exploitation of conflicts of interests—should be highlighted as negative examples to the scientific community, as their behaviour is damaging not only science, but also the practice of science as a model for public ethics.

We hope that international experts in sociology and science policy find that the censorship of science, the manipulation of facts and the lack of objective peer review and evaluation in Italy deserve their attention and intervene on behalf of Italian science. They would be up against an interesting paradox: such abnormal conducts are often defended in the name of alleged democratic principles. The introduction of Law 40, for example, was justified publicly under the assumption that most Italian citizens were against the use of embryonic stem cells in research—which is, incidentally, false (Eurobarometer, 2006)—and the Apulia judge's ruling on DBM was made on the grounds of individual freedom of access to therapy, laid down by the Italian constitution.

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One could ask whether the situation in Italy is simply a local consequence of a deteriorating relationship between science and society, or between scientists and politicians. In other words, is Italy an exception, or simply a vision of things to come in other countries? Regardless, the predicament of Italian science and scientists should stand as a warning of what happens when the rules of transparency are overridden, the scientific community remains largely silent, scientific facts have marginal political influence and science communication is helpless against ideologically driven propaganda that manipulates facts on a large scale (Corbellini, 2010). The experience of scientists in the USA during the Bush administration shows that for other countries this possibility is not too far-fetched and that, to paraphrase the British statesman Edmund Burke (1729–1797): bad science flourishes when good scientists do nothing.

CONFLICT OF INTEREST

Elena Cattaneo is currently appealing in court against the Italian Ministry of Health's decision to exclude research on human embryonic stem-cell lines from a call for proposals for stem-cell research in 2009 (see Interview, doi:10.1038/embor.2010.194).

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