Bonino, Emma, Vice-President, Italian Senate; former European Commissioner and former Minister for International Trade and European Affairs; member of the Nonviolent Radical Party, transnational and transparty, and Simona Giordano, Reader in Bioethics The University of Manchester. "The Future of Scientific Research: Compromises or Ways Forward?." *Scientific Freedom: An Anthology on Freedom of Scientific Research*. Ed. Simona Giordano, John Coggon and Marco Cappato. London: Bloomsbury Academic, 2012. 102–110. Science, Ethics and Society. *Bloomsbury Collections*. Web. 26 Apr. 2023. <<http://dx.doi.org/10.5040/9781849669009.ch-010>>.

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The Future of Scientific Research

Compromises or Ways Forward?

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Introduction

‘The future is not ours to see’, as the song goes, and thus, it may be argued, the future of science is hard to predict. Yet politicians and policy makers¹ must attempt to predict the future or at least take measures to amend the mistakes of the past.

Scientific research is a good from which we all benefit. We all profit from living in a society that pursues scientific research.² Freedom of science is a prerequisite in the protection of fundamental human rights: for example, freedom from preventable diseases, the right to a better society, to health, and to knowledge. Therefore, in this chapter we argue that the future we should all strive for is one in which science can flourish to the benefit of all people.

In spite of its obvious value, scientific research is frequently the arena of acrimonious debates. These often occur in areas of science that involve the use of human beings or of human materials, and in those that promise (or, according to some, threaten) to modify human ‘nature’ (most often undefined) or the environment.

These debates are often useful to the ethical progress of science. For example, just after the end of the Second World War, various international organizations produced ethics guidelines relating to the balance to be drawn between scientific development and what can ethically be imposed on research subjects for that development to occur. Debates on the ethical principles that should guide science have imposed limits to the freedom of researchers, but have perhaps better guaranteed global standards of legitimacy and allowed science to progress with greater respect for human rights.^{3,4}

On other occasions, however, debates seem informed more by ideologies or irrational fears, rather than by a genuine concern for the health and dignity of human beings (both those involved in research and beneficiaries of research). This seems to have been the case with some areas of medical sciences, in particular research on cell nuclear transfer and stem cells.

In this chapter, we consider how in Europe some sensitive issues around these areas of science have been addressed, and the way in which some compromises, or ways forward, have been found. We provide a brief narrative of the political debates around cell nuclear transfer and embryonic stem cell research, in order to highlight how divergences in political or ideological faiths may be balanced out for the benefits of science and society.

We shall argue that, in cases in which science raises important concerns and strong ideological opposition, it is crucial that politicians mobilize to divulge proper information about the methods and aims used in the areas of science under scrutiny, that they highlight the purposes of those areas of science and that they identify and address any serious concern that the public may express.

Politicians need to go beyond their ideologies, for the greater benefit of societies, and establish a synergy with experts, scientists, the media, groups with different ideas and visions, and engage in an informed and accessible way with the public. Politicians, because they are responsible for the public *res*, must remind themselves and each other that science is for the people, and this goes well beyond their particular political credo; scientists should also be accountable to the public, and politicians should favor a mediation between experts and lay people, in the interests not of their ideologies, but of the people.

On the freedom of scientific research

Defending freedom of research, in our view, is a part of a more general defense of people's freedom. Defending freedom of science is not akin to saying that there should be no control or no limits imposed on scientists. Science has to progress in an ethical way. Research subjects must be protected, be they human or non-human animals; money spent on research, rather than on other goods, must be justifiable to the public; scientists must be held accountable to the public as well as to the scientific community for the public money that they spend. Above all, the results of scientific research cannot be applied blindly, regardless of their consequences for human welfare. We are therefore not advocating unregulated freedom. We are, instead, emphasizing that it is in everybody's interests to live in a society that pursues scientific research. Life expectancy has raised and is rapidly increasing in many parts of the world; people's quality of life has generally improved greatly; many diseases that were lethal are now treatable. Of course this raises a further issue of global justice, in that the results of scientific research are often unevenly distributed.

This, however, is not an objection to science itself, but to how its results ought to be distributed. Because of the great benefits that each and all of us can draw from freedom of science, if and when such freedom is to be restricted, it has to be on stringent grounds. Freedom of research can and should be restricted when it is highly unlikely to yield benefits to the human kind, or when it is highly likely to yield significant harm. In all other cases, research is to be regarded as a public good, and as such, is to be defended and protected. If anything, the political debate should focus on how to ensure that disadvantaged populations or communities not be excluded from the good.

It is really surprising how as soon as research and the results obtained from it are in use, such as in treatments which are suddenly widespread and common, they are taken for granted, as though everybody has forgotten that they were the fruit of years of research, of freedom of research, of investment, of fundraising, of volunteers' support. In this light it was with the greatest anxiety that many awaited President Obama's decision to lift restrictions on federal funding of human embryonic stem cell research, so turning a new page after the somewhat destructive outcomes of the alliance of the Bush administration with other countries and institutions.

The opposition of the Bush administration was not, of course, an isolated case: embryonic stem cell research has been at the centre of many heated ethical and political debates. Many readers will also be aware of the bans against so-called 'reproductive cloning'.⁵ We believe it is important to highlight some aspects of the political debate in Europe in the last decade on these areas of science, as one of the authors of this chapter has been directly involved in that debate, and in decisions relating to the European funding for research involving both the use of embryos for scientific purposes and for so-called 'therapeutic' cloning. We shall not discuss the philosophical and ethical issues around the moral status of the embryos or the logical stringency of the reasons against 'reproductive cloning'.⁶ Also, we shall not discuss the scientific aspects of these two areas, as these go well beyond the remit of this chapter.

Sensitive areas of science: The case of cell nuclear transfer

As is well-known, after the news of the birth of Dolly the sheep, released by Nature in 1997,⁷ international organizations came together to condemn the application of cell nuclear transfer (ordinarily known as 'cloning') to human reproduction.⁸ Policy-makers promptly received the given advice: 'reproductive cloning' is now either illegal or in practice prohibited everywhere. The panic around it, also fed by fiction and false claims by pseudo-scientists of dubious credibility⁹ in reality was also an expression of the ethical concerns surrounding 'non-reproductive cloning', and thus the technique of cell nuclear transfer in all its forms.

The opposition was fierce and came from different parts, but perhaps the United States and the Vatican, for once in concert, proved the most influential, at least from a political point of view. Opponents to cell nuclear transfer contested that the technique was unsafe, dangerous, that it would lead, across a slippery slope, to all kinds of manipulations of human nature as well as to macabre forms of exploitations of vulnerable humans. The main objections to cell nuclear transfer were that the refinement of the technique, even its therapeutic potential, would confer on scientists the powers of Gods, would enable unscrupulous scientists to create humans, perhaps to harvest their organs, or for reproductive purposes, thus at best endangering the genetic pool, violating people's right to genetic identity, and at worse creating armies of new Hitlers ready to conquer the world. We have witnessed a bout of catastrophic thinking at its very best in the debates around cell nuclear transfer.

To some, certainly cloning was opening a whole new era of unethical experimentation on human beings. But none of this has taken place. People have not been treated worse because of the refinement of the technique, improbable armies have not been created, and the tones of conversation have, with time, significantly quietened down.

Many argued right away that this was nonsense. One of the authors of this chapter campaigned,¹⁰ with many others, to reject the proposal to ban all forms of cloning without making any distinction between 'reproductive' and 'therapeutic' cloning.

The opposition against 'cloning' was not only the result of ideology but perhaps, even more strikingly, of ignorance. For that reason, when in April 2004, the UN Commission on Human Rights gathered together in Geneva to discuss cloning, the Nonviolent Radical Party (NRP) chose to approach the Commission on Human Rights, rather than the Scientific Commission, believing that the issue related first and foremost to the right to knowledge. Four months of international mobilization, coordinated with the US-based Coalition for the Advancement of Medical Research and the Genetics Policy Institute, had the effect of substantially scaling down the proposal at the United Nations. The NRP appeal 'against an international ban on human embryonic stem cell research for therapeutic purposes' gathered more than 1,500 signatures of members of national parliaments, academics and scientists. Among them were 77 Nobel laureates.

Also thanks to this effort, in 2005 the UN General Assembly opted for a non-binding declaration on human cloning instead of a binding convention, due to a divisive vote on the question of human reproductive cloning being deemed different from therapeutic cloning.¹¹ As a result of this, research on cell nuclear transfer can go ahead, although it is declared that the 'entity' created by cell nuclear transfer (whether an 'embryo' or not)¹² cannot be implanted in a woman's womb.

This ‘compromise’ may not satisfy everyone. In the ethics literature, for example, it has been argued that there is no reason to ban ‘reproductive cloning’.¹³ Cell nuclear transfer may provide a useful method of reproduction to people who are unsuitable for IVF, may in theory prevent the transmission of inheritable gender-related diseases, and may give genetically related children to single parents and gay/lesbian couples without using donor gametes (and thus without donor’s DNA).

However, given the technical problems that need to be resolved before cell nuclear transfer becomes a viable,¹⁴ financially sustainable and ethically defensible reproductive method, arguably the ‘compromise’ allows for research to proceed, which would have otherwise be banned. The arguments in principle must thus be balanced with the serious concerns relating to the safety of the technique for any given purpose.

We believe it is important to bear in mind the importance of this compromise, as an example of how politics can and should pragmatically assess the problems raised by science, and make educated decisions based on proper information, seeking to weigh up diverse views. Serious concerns must be given due importance. This kind of compromise in public policy does not mean giving in to illogical arguments or superstitions, or ideology. On the contrary, it means assessing in a rational way the pros and cons of the various available options, and ensuring that the objectives that we pose to ourselves as policy makers (which should always primarily involve the protection and promotion of people’s welfare and rights) are achieved, even if one step at a time.

The value of pluralism

Pluralism is one of the greatest achievements of humankind. Pluralism refers to a condition in which two or more principles coexist. It also refers to a form of society in which individuals, or groups of individuals, maintain their own independent traditions and values. The recognition of the equal value of all people, regardless of their gender, ethnic origins, age, religion or political views has been an accomplishment of liberal societies, and the value of diversity is rightly celebrated by virtually all conventions and declarations of human rights and fundamental freedoms.¹⁵ Conflicts of values are to some extent the spontaneous progeny of pluralism, and in this sense, they should also be deemed important and beneficial.

Yet, the right to have one’s opinions implemented is rightly limited when, in order to put those opinions into effect, it is necessary to harm others, or to deny them important benefits. For this reason it is arguably immoral to prohibit research on stem cells or cell nuclear transfer, which may yield great benefits to millions of people, just to respect the views of a section of society. That section has a right to peaceful opposition, to free speech and free opinion.

It has a right to try to persuade others that they are wrong, to confer with them, or, eventually, not to use the results of that research. Yet, if an area of science is likely to alleviate the suffering of many, to improve their quality of life, or to cure debilitating diseases, or to save people from premature death, it is a moral responsibility of policy makers to ensure that that area of science is supported, unless there are very solid reasons not to. Opinions, however loudly spoken, are not solid reasons. Policy makers must ensure that the views (even if their own) that may impinge negatively on others' welfare be not transformed into public policy or into law.

Pluralism and information

In the previous section, we argued that pluralism is a value, and it is a value that policy makers should protect. Clearly, pluralism that characterizes liberal societies means that, in some delicate areas of science, important conflicts of views arise. Policy makers need to balance out these views, in order to ensure that science may progress.

One of the most crucial tasks of politicians, in this effort of accommodating potentially conflicting values, is to ensure that the public is properly informed about science. Some of the concerns relating to 'cloning' for example, as pointed out earlier, are based on facts and are serious. Others, instead, are unmotivated, and derive from ignorance: these must also be addressed and corrected. For example, the idea that scientists may be able to allow dictators to replicate themselves,¹⁶ and similar absurdities fed by the media and by fiction, must be clearly corrected, as they are seriously detrimental to science, and therefore, to society as a whole. Likewise, flamboyant promises that if you store the stem cells of, say, your umbilical cord during childbirth, you will be cured, should you later develop cancer, or even a ligament injury¹⁷ should also be corrected.

Giving false hopes renders citizens vulnerable to exploitation by unscrupulous 'pseudo-scientists', who damage not only the people who are cheated, but science and society as a whole. Policy makers thus must ensure that proper information is disseminated to the general public about the most sensitive areas of science.

How political initiatives may change the direction of science

Let us now consider the case of stem cell research. Whereas the ethics debates relating to the moral status of the embryo are well known, perhaps the political vicissitudes are not as noted. In 2006 the European Parliament was discussing the 7th Framework Program for Research and Technical Development (7FP) that would establish the allocation of the European funds for the period 2007

to 2013. During a European Council of Ministers of Science and Research, representatives from Germany, Austria, Italy, Poland, Malta and Slovakia decided to oppose the funding of stem cell research. In this context, the Luca Coscioni Association established a Constituent Assembly of the World Congress for Freedom of Scientific Research. The Assembly met first in October 2004 and continued through the first meeting in February 2006. Through these initiatives, a petition was launched calling on the European Parliament to ensure that the 7FP confirmed, at least, the funding of research projects on stem cells obtained from supernumerary embryos and that eligibility to funding be extended to research projects on nuclear transfer. Those events were decisive for the success of the campaign at the United Nations against the proposal to ban embryonic stem cell research altogether, as well as for the campaign in favour of the financing of such research by the European Union.

In December 2006, the 7FP was approved and enforced by the European Parliament and the European Council. The 7FP decreed that research projects on stem cells might be funded, insofar as no further embryos are created specifically for research purposes. In practice, this meant that research may be legitimate only on spare embryos resulting from IVF procedures, or on stem cell lines already created. The 7FP also reiterated that research on human reproductive cloning and on germ line modification of the human genome would not be funded.

In January 2007, the European Parliament officially communicated to the Luca Coscioni Association that a big effort had been made to find what it called a 'just and balanced compromise'. Again, this was a compromise that represents a momentous way forward.

We believe it is important to describe these instances of political intervention at an international level for what they can teach us. When decisions have to be made on sensitive issues, especially issues that concern and affect the welfare of others as well as our own, it is important that a number of various actors and beneficiaries be engaged in an informed debate relating to the advantages or disadvantages of the various options open. Bringing together patients, politicians, scientists and ordinary citizens is a positive innovation, which can yield better results as compared with the usual way of campaigning, often characterized by an ideological quarrel that leads to either prohibition or dissatisfactory solutions for all. As Baron has pointed out in his chapter in this volume, political dialogue and the involvement of people can be much more fruitful than sheer opposition against what we disagree with, when, as politicians, we want to ensure the progress of science for the benefit of people. In other words, a pragmatic approach that takes into serious consideration the opposition, and the worries of the people, can prove useful to finding a way forward, especially insofar as sensitive issues are concerned.

Of course, as mentioned before, this rests on dissemination of proper information. In their contribution to this volume, Corbellini and Sirgiovanni

have highlighted various examples of misinformation provided by the media to the general public, and the negative impact this has had on the health of Italian citizens.¹⁸ We shall not revisit these issues, which have been extensively covered by Corbellini and Sirgiovanni. As they point out, not only people's health and welfare, but democracy itself is threatened when information about science is misguided. The media has an important responsibility to ensure citizens are properly informed, but also the scientific community has the responsibility to divulge the directions of science and address the concerns that people may have, and citizens themselves, especially in 'developed' countries, have the responsibility to be skeptical and inform themselves properly. Politicians and policy makers have the task of implementing the evidence available through laws and policies that best serve the welfare of people. It is only via this concerted assumption of responsibility that science can flourish. In order to favor scientific progress, and thus the welfare of the people, we need not only the commitment of the scientists but also the synergies which arise from other aspects of the social and political life of each country.

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