

---

# Bioethics Outlook

**John Hubert Plunkett**

**Centre for Ethics**

**Australian Catholic University**

**St Vincent's Health Network Sydney, Calvary Healthcare, Mercy Hospital  
Melbourne, Cabrini Hospital Melbourne**

**Volume 34, No 1**

**March 2023**

---

**The ethics of playing God:**

**let's walk before running with 'gene scissors'**

**Margaret Somerville**

A recent article in *Nature Biotechnology* reports on the risks and benefits of the therapeutic use of CRISPR-Cas9 "gene scissors" technology.<sup>1</sup> A comment on the *Nature* article published in the *Jerusalem Post* explains: "*CRISPR – an acronym for 'clustered regularly interspaced short palindromic repeats' – allows genetic material to be added, removed or altered at particular locations in the genome ... [The researchers at Tel Aviv University found] that while the CRISPR genome-editing method is very effective, it is not always safe and that sometimes, rearranging pieces of DNA compromises genomic stability, possibly triggering cancer in the long run.*"

So, what ethical issues are raised by this technology?

---

## **In this issue:**

- The pope's address to the Pontifical Academy for Life at its recent meeting on emerging biotechnologies and the common good.
- Mensuram Bonum - the advice of the Pontifical Academy for Science on ethical investing.

---

Good ethics depend on good facts. Broadly defined, the human genome is the DNA, including genes, which constitutes each of us. We will pass on some of our genes to our descendants; and manipulating these, which is possible with CRISPR-Cas9, is an unprecedented ethical issue, because it means we can attempt to design our children and their descendants. We also have somatic-cell genes, some of which can produce disease. These can also be changed with CRISPR Cas9 technologies used as medical treatment, but the changes are not inheritable. This is the type of intervention discussed in the *Nature Biotechnology* article, where the main ethical issue, as with all new medical interventions, is whether the benefits of the treatment outweigh its risks and harms.

“Genetic scissors” technologies, such as CRISPR-Cas9, are a relatively recent and an ethically controversial addition to the exploding field of reproductive technologies, because, as explained, they can be used to “design” a human embryo. To understand the ethical issues they raise in this respect, we need to locate them in a broader reproductive-technology context, rather than simply view them in isolation.

## **The Reproductive-Technology Context**

Once upon a time, before the late 1970s, there was only one way that a new human life could come into existence: sexual intercourse between a fertile woman and a fertile man. Many couples saw the life they created as a gift from God and, whatever their child’s characteristics, loved and accepted him or her without question.

The widely accepted societal value was that parents loved their children unconditionally, simply because they were their children. Women, especially, carried this value of parents’ unconditional love for their children for society as a whole.

A woman abandoning her child was condemned much more forcefully than a man doing so. Think of the young man from a wealthy family, who impregnated a maidservant, being shipped off by his parents to the colonies to “sow his wild oats”, while the maidservant was left destitute and caring for the child. People sometimes regarded the man, somewhat admiringly, as “clever” to escape responsibility, while the woman was shamed and scorned even more than just for being pregnant out-of-wedlock, if she abandoned or failed to care for the child.

One reason surrogate motherhood was met initially with such condemnation was that it overtly contravened the societal value, carried largely by women, of a parent’s unconditional love for his or her children. In short, this value was based on an assumption that a woman automatically and unconditionally bonded to the children to whom she gave birth; it was unthinkable that a woman would intentionally become pregnant with a prearranged plan to give up her baby, as the recognition of surrogacy instantiated.

---

## The Reproductive-Technology Revolution

The reproductive-technology revolution changed not only, the reality of having no option other than sole reliance on Nature to conceive a child but also, for many people, their values governing reproduction. The most dramatic herald of this revolution was the birth in Britain in

1978 of Louise Joy Brown, the first “test-tube” baby. It is estimated that now more than eight million babies have been born worldwide using *in-vitro* fertilisation (IVF).

Louise Brown was conceived from her father’s sperm and her mother’s ovum in a laboratory. Sexual intercourse was no longer the only way to transmit human life and interventions on the *in-vitro* embryo, the earliest form of human life, were now possible.

This opened up the possibility that we could now choose our children, rather than loving them unconditionally just because they were our children. And, as time went on, we could increasingly intervene to design them to accord with the characteristics of the child we wanted. CRISPR-Cas9 and subsequent developments of this technology are among the most recent means for undertaking such design.

### CRISPR-Cas9

CRISPR-Cas9 was discovered in 2012 and is best imagined as a molecular scissors. Scientists can use it to edit the human genome, all the genes that constitute each of us that were passed on to us from our ancestors. Sometimes those genes are harmful or damaged. CRISPR-Cas9 allows the scientist to cut out such sequences of DNA and to insert replacement genes.

An ethically important distinction between genes in the germline and in somatic cells needs to be kept in mind. Changes to somatic cell genes are not inheritable and, while such interventions can raise important ethical issues, they are not of the same kind or seriousness as those raised by changes to genes in germline cells.

Alterations to the genes of an embryo will be passed on to all descendants of that embryo. This type of intervention constitutes pre-empting evolution as the agent of genetic change.

When there was no possibility of intervening intentionally to alter the human genome, which is estimated to have evolved over up to six million years, there was almost universal agreement that it would be wrong and unethical to do so. Many jurisdictions, including Australia, had laws prohibiting altering a human embryo’s genes in any way that would be inheritable. (That law has now been repealed.)

The consensus was that the human genome was the common heritage of humankind that must be held unmanipulated by us on trust for future generations.

Transhumanists speak of “unmodified humans” as inferior beings and foresee a future of eventual immortality from genetic modification of the genes responsible for aging.

---

By 2015, scientists were actively lobbying to change this view. An invitation-only meeting was held in Atlanta, Georgia (*“Beings 2015, Biotech and the Ethical Imagination: A Global Summit”*), attended by around four hundred participants to discuss what the future position on altering the human germline should be.

Harvard geneticist Professor George Church and his colleague, social psychologist Professor Steven Pinker, argued powerfully for allowing the research to proceed. They relied heavily on the technologies’ promise of doing great good in eliminating devastating genetic diseases.

I argued against allowing this with respect to germline genes, a position on which I have since modified my views to a strictly limited extent. Pinker’s conclusion was that if bioethicists, such as myself, opposed this research, society should not prohibit it; rather, it should get rid of the bioethicists. He won the argument. With certain controls, the research has gone forward.

I set out the rather long preamble to this article to situate the questions we need to ask about CRISPR-Cas9 in the larger context of the extraordinary development of reproductive technologies, which is necessary if we are to keep its use within ethical parameters.

IVF has enabled the development of these technologies, because having a human embryo in a test-tube makes it much easier to manipulate it. If IVF, itself, is immoral and unethical, then genetic interventions on embryos become much more difficult and for some purposes impossible.

The Catholic Church teaches that IVF is immoral, because in separating the unitive and procreative characteristics of the passing on of human life through sexual intercourse, it unavoidably offends human dignity. However, this teaching has recently been the focus of discussion by the Pontifical Academy for Life (*“Rereading the Theological Ethics of Life in the Light of Pope Francis”*, by Jorge José Ferrer, SJ, July 21, 2022). Moreover, the view of many people reflected in polls, including a large number of Catholics, shows they believe that, provided certain conditions are respected, IVF can be moral and ethical.

Multitudes of thorny ethical problems were raised both by IVF itself – for example, the respect required for the transmission of human life outside the body of a woman, an issue we had not faced before IVF – and by the deluge of technological interventions and social changes to which IVF gave rise.

I will not discuss those here; rather, I will identify some of the specific ethical concerns raised by CRISPR-Cas9 when it is used to alter genes of the germline. Note that some of these concerns are common to many reproductive technologies and not just CRISPR-Cas9.

## **Ethical Concerns Raised By CRISPR-Cas9**

First, let us find where we can agree. Everyone wants to eliminate or reduce suffering. The scientists wanting to use CRISPR-Cas9 to change an embryo’s germline genes want to be able to eliminate horrible genetic diseases, such as Huntington’s chorea, muscular dystrophy,

---

diabetes and so on. They make a distinction between therapeutic or curative germline interventions with CRISPR-Cas9, and enhancement ones, altering genes, for example, to augment intelligence or sporting ability, or to change eye colour, height, and so on. They argue for allowing the former, if not the latter.

No matter how worthy the intentions of the scientists, they are designing/redesigning a human being. Transhumanists see this as creating a human utopia of the future. They speak of “unmodified humans” as inferior beings and foresee a future of eventual immortality from genetic modification of the genes responsible for aging.

Do all humans, however, have a right to come from unmodified natural human origins and should this right be absolute or should some strictly limited exceptions allowed?

The American Jewish philosopher, the late Hans Jonas, put it this way: “Every human being has a right to their own unique ticket in the great genetic lottery of the passing on of human life. A right not to be designed. A right to live their life as a surprise to themselves.”

German philosopher Jürgen Habermas pointed out that the designed person is not free, because freedom requires us to have non-contingent origins to enable us to go back and recreate ourselves from scratch. Moreover, they are not equal to the designer, because the designed entity is never equal to the designer.

This analysis takes the issues raised by designing our progeny beyond concern just for the individual who is designed. It has political implications, because two of the pillars of democracy are respect for every individual’s freedom and accepting that everyone is equal. Wanting to design in order to enhance one’s child, sends the message that “you were not perfect enough as you were naturally; we needed to improve you to conform to our specifications for us to accept and love you”.

## **Societal Effects**

To return to the earlier discussion of unconditional parental love as a personal and societal value. Wanting to design in order to enhance one’s child sends the message that “you were not perfect enough as you were naturally, we needed to improve you to conform to our specifications for us to accept and love you”.

Australian bioethicist Robert Sparrow from Monash University has raised another issue. He pointed out that just as our laptops and iPhones become obsolete models as the technology continuously improves, so earlier conceived children will be obsolete compared with their later designed siblings. What would this do to family cohesiveness and harmony?

A central, ubiquitous characteristic of the worldwide fertility industry, which mostly markets reproductive technologies, is its overwhelmingly adult-centred focus and almost complete

---

failure to place the future child at the centre of the decision-making. This is understandable: adults make the decisions to use reproductive technologies and to spend the money required to do that.

The fertility industry is estimated to be worth \$US8 billion each year in the United States alone – \$US15 billion worldwide – and continues to expand rapidly. Child-centred decision-making would ask, among many questions, can we reasonably anticipate that, if this person were here and able to decide for themselves, they would consent to what we are planning to do?

Child-centred decision-making would also look at the risks and harms of the technology to the child. Even if the technology were used only for therapeutic purposes, there are substantial risks, including unknown ones.

For example, some genes exhibit a complex phenomenon called pleiotropy – one gene can code for multiple different proteins, possibly up to a thousand.

Moreover, depending on its placement in the genome, a gene may function differently; and a gene inserted with CRISPR-Cas9 might not position correctly.

The presence of risk is not, however, an insurmountable ethical obstacle. It can be managed and an ethically acceptable risk/benefit ratio achieved.

Larger ethical questions raised by CRISPR-Cas9 at the societal level include treating our children as products or things that we own – as “somethings” not “somebodies”, a phenomenon called “reification” – rather than unique individual human beings with respect to whom we have obligations, but not rights to design.

## Conclusion

The possibility of eliminating or treating dread diseases with “genetic scissors” technologies must not blind us to the ethical risks and harms involved. It is very difficult, as I know from personal experience, to say to a scientist, who only wants to do good, “No, you must not change a seriously harmful gene in an embryo’s germline” and I am increasingly uncertain I will continue to say that in all cases.

My concern about allowing such changes includes the precedent this would create that it is ethically acceptable to genetically design a human being and where that would lead.

On the other hand, the suffering avoided by allowing a therapeutic intervention shown to be reasonably safe that would prevent a very serious disease could justify a strictly limited and governed intervention.

CRISPR-Cas9 therapeutic interventions that do not involve inheritable changes, such as the ones discussed in the *Nature Biotechnology* article, being used to treat serious debilitating disease raise important ethical issues and concerns, but not the one of designing a human being and

---

their descendants. They should be governed under the generally applicable medical-research ethics principles, especially with respect to risk-harm/benefit calculations.

This year marks the 25th anniversary of *Gattaca*, the brilliant dystopian sci-fi film about a future in which all children are supposed to be genetically engineered. The hero is an “in-valid”, a rare human who was naturally conceived. At one point he reflects, “I belonged to a new underclass, no longer determined by social status or the colour of your skin. No, we now have discrimination down to a science.”

CRISPR could make such a future possible, at least for those who can pay for it. Before we arrive there, we need to ask many more questions about the ethical dilemmas genetic engineering is creating.

**Margaret Somerville is Professor of Bioethics at the University of Notre Dame Australia in Sydney and was the founding director of the Centre for Medicine, Ethics and Law at McGill University in Montreal, Canada.**

## Footnotes

- 1 Nahmad AD1, Reuveni et al., “Frequent aneuploidy in primary human T cells after CRISPR-Cas9 cleavage”, *Nature Biology*, June 30, 2022
- 2 This article was originally published in *NewsWeekly* in September 2022:  
<https://ncc.org.au/newsweekly/health-education/the-ethics-of-playing-god-crispr-cas9/>

---

# Emerging Technologies and the Common Good

## ADDRESS OF POPE FRANCIS TO THE MEMBERS OF THE PONTIFICAL ACADEMY FOR LIFE

20 February 2023

In these days you will reflect on the relationship between the person, emerging technologies and the common good: it is a delicate frontier, where progress, ethics and society meet, and where faith, in its perennial relevance, can make a valuable contribution. In this sense, the Church never ceases to encourage the progress of science and technology at the service of the dignity of the person and for an "integral and integrating" human development. [1] In the letter I addressed to you on the occasion of the twenty-fifth year of the founding of the Academy, I invited you to explore this very theme; [2] now I would like to reflect with you on three challenges that I consider important in this regard: the changing conditions of human life in the technological world; the impact of the new technologies on the very definition of "man" and "relationship", with particular reference to the condition of the most vulnerable; and the concept of "knowledge" and the consequences that derive from it.

### The first challenge

The first challenge is the change in the conditions of life of humanity in the world of technology. We know that it is proper for humanity to act in the world in a technological way, transforming the environment and improving the conditions of life. Benedict XVI recalled this, affirming that technology "touches the heart of the vocation of human labour" and that "in technology, seen as the project of his genius, man recognizes himself and forges his own humanity". [3] It therefore helps us to understand ever better the value and the potential of human intelligence, and at the same time it speaks to us of the great responsibility we have towards creation.

In the past, the connection between cultures, social activities and the environment, thanks to less dense interactions with slower effects, was less impactful. Today, instead, the rapid

---

development of technical means makes the interdependence between man and the “common home” more intense and evident, as Saint Paul VI already recognized in *Populorum Progressio*. [4] On the contrary, the force and acceleration of interventions is such as to produce significant mutations - because there is a geometric acceleration, not a mathematical one -, both in the environment and in human living conditions, with effects and developments that are not always clear and predictable. This is being demonstrated by various crises, from the pandemic to the energy crisis, from the climate crisis to the migratory crisis, the consequences of which affect one another, amplifying each other. Sound technological development cannot fail to take into account these complex intersections.

### **Second challenge**

The second challenge is the impact of the new technologies on the definition of “man” and “relationship”, especially with regard to the condition of the most vulnerable people. It is clear that the technological form of human experience is becoming more pervasive every day: in the distinctions between “natural” and “artificial”, “biological” and “technological”, the criteria for discerning what is proper to the human and the technological are becoming increasingly difficult. In particular, the importance of the concept of personal consciousness as relational experience, which cannot be separated from corporeality or culture, must be decisively reaffirmed. In other words, in the network of relationships, both subjective and community, technology cannot supplant human contact, the virtual cannot substitute the real, and the social networks cannot replace the social environment. And we are tempted to let the virtual prevail over the real: this is an ugly temptation.

Even within processes of scientific research, the relationship between the person and the community indicates increasingly complex ethical turning implications. For example, in the field of healthcare, where the quality of information and the assistance of the individual depends largely on the collection and study of available data. Here the problem of reconciling the confidentiality of personal data with the sharing of information that affects the interest of all must be addressed. Indeed, it would be selfish to ask to be treated with the best resources and skills available to society without contributing to increasing them. More generally, I think that the urgency that the distribution of resources and access to treatment should be to the benefit of all, so that inequalities are reduced and the necessary support is guaranteed to the most fragile, such as the disabled, the sick and the poor.

It is therefore necessary to be vigilant about the speed of transformations, the interaction between changes and the possibility of guaranteeing an overall balance. Moreover, this balance is not necessarily the same in different cultures, as instead the technological view would appear to presume when it imposes itself as a universal and homogeneous language and culture – this is a mistake. Instead, efforts must be made to ensure that each one “be helped to grow in its

---

own distinct way and to develop its capacity for innovation while respecting the values of its proper culture". [5]

### **Third challenge**

The third challenge is the definition of the concept of knowledge and the consequences that derive from this. All the elements considered so far lead us to ask ourselves about our ways of knowing, aware that the fact that the type of knowledge we implement already has moral implications in itself. For example, it is reductive to look for the explanation of phenomena only in the characteristics of the individual elements that compose it. There is a need for more structured models, that take into account the interplay of relationships of which single events are woven. For instance, it is paradoxical when referring to technologies for enhancing a subject's biological functions, to speak of an "augmented" person if one forgets that the human body refers to the integral good of the person and therefore cannot be identified with the biological organism alone. A wrong approach in this field actually ends up not by "augmenting", but by "compressing" man.

In *Evangeli Gaudium* and especially in *Laudato si'*, I emphasized the importance of knowledge on a human, organic scale, for example highlighting that "the whole is greater than its parts" and that "everything in the world is connected". [6] I believe that such insights can foster a renewed way of thinking also in the theological sphere; [7] indeed, it is good for theology to move beyond eminently apologetic approaches, to contribute to the definition of a new humanism and to foster reciprocal listening and mutual comprehension between science, technology and society. Indeed, the lack of constructive dialogue between these realities impoverishes the reciprocal trust that underlies all human coexistence and every form of "social friendship". [8] I would also like to mention the importance of the contribution of dialogue between the great religious traditions to this end. They possess secular wisdom, which can help in these processes. You have shown that you know how to grasp its value, for example by promoting, even in recent times, interreligious meetings on the topics of the "end of life" [9] and artificial intelligence. [10]

Dear brothers and sisters, faced with such complex current challenges, the task before you is enormous. It is a matter of starting from the experiences we all share as human beings and studying them, taking on the perspectives of complexity, trans-disciplinary dialogue and collaboration between different subjects. But we must never be discouraged: we know that the Lord does not abandon us and that what we accomplish is rooted in the trust we place in Him, "who loveth the living" ( *Wis* 11:26). You have committed yourselves in recent years so that scientific and technological growth be increasingly reconciled with a parallel "development in human responsibility, values and conscience" [11]: I invite you to continue along this path, while I bless you and ask you, please, to pray for me.

---

[1] Encyclical Letter *Laudato si'*, no. 141.

[2] Cf *Humana communitas*, 6 January 2019, nos. 12-13.

[3] Benedict XVI, Encyclical Letter *Caritas in veritate*, n. 69.

[4] Cf. no. 65.

[5] Encyclical Letter *Fratelli tutti*, no. 51.

[6] Apostolic Exhortation *Evangelii gaudium*, nos. 234-237; Encyclical Letter *Laudato si'*, n. 16.

[7] Cf. Apostolic Constitution *Veritatis gaudium*, nos. 4-5.

[8] Cf. Encyclical Letter *Fratelli tutti*, no. 168.

[9] Cf. *Position Paper of the Abrahamic monotheistic religions on matters regarding the end of life*, 28 October 2019.

[10] Cf. Signing of the *Rome Call for AI Ethics*, 10 January 2023.

[11] Encyclical Letter *Laudato si'*, no. 105.

## Bioethics Outlook goes online...

Dear Reader

We have decided to distribute our quarterly publication, *Bioethics Outlook*, digitally by email rather than by post. From this issue, it will now be sent to you as a PDF.

Do please keep us up to date with any changes in your email address.

With thanks.

[Philippa.wilson@acu.edu.au](mailto:Philippa.wilson@acu.edu.au)

---

# *Mensuram Bonum*

## **Faith-based measures for Catholic Investors**

Late last year, the Pontifical Academy for Science published *Mensuram Bonum* (in English ‘A good measure’), a resource for Catholics involved in investing to help them to adopt and apply faith-based criteria in the stewardship of their finances.<sup>1</sup> The Academy wishes to encourage institutions systematically to integrate Catholic Social Teaching into their investment policies, and to adjust them where necessary from time to time.

The document, 46 pages in full, draws on two primary sources, the *Catechism of the Catholic Church* and the *Compendium of the Social Doctrine of the Church*, and it pulls together work done by the Second Vatican Council, several popes, several episcopal conferences around the world as well as economists and experts in finance, investing and ethics.

From the faith come ideas such as how best to understand the job-description of investors, whether good measures for integrity as a faith-based investor have been explicitly clarified, whether the ecological impacts of social attitudes and personal consumption been costed, whether profits are ‘true’ in providing honest, fair and value-enabling benefits to humans and society (rather than ‘false’ in that harmful impacts have been downloaded on future generations).

From Catholic social teaching come explanations of the implications for investment policies of eight key ideas from the tradition:

- the human person and human dignity,
- the common good,
- solidarity,
- social justice,
- subsidiarity,
- care for our common home,
- inclusion of the most vulnerable, and
- integral ecology.

There are suggestions for ‘getting started’, for learning from ‘Catholic innovators’, and for ‘faith-based investing’ in practice.

Of particular note are twenty-four categories of ‘concern’ or ‘prohibition’ which, identifying issues for investors, require ‘discernment from faith’. They are grouped together as follows:

---

<sup>1</sup> [https://www.pass.va/en/publications/other-publications/mensuram\\_bonam\\_eng.html](https://www.pass.va/en/publications/other-publications/mensuram_bonam_eng.html)

- 
- 1     **Intrinsic dignity of human life:** abortion, armaments, nuclear weapons, capital punishment, contraceptives, embryo stem cell research, animal experimentation.
  - 2     **Patterns leading to addiction and abuse:** addictive substances or services, computer games or toys, pornography.
  - 3     **Global impacts and sustainable development:** breaches of labour law, corruption, discrimination, human rights violation, the overlooked rights of indigenous peoples, totalitarian violence and oppression, unfair/unethical business practices.
  - 4     **Environmental protection:** climate change, exploitation of the environment, food and agricultural commodities, green/genetic engineering, hazardous chemicals and climate-damaging substances, mining and mineral commodities, clean water.

Quoting the Austrian Bishops, *Mensuram Bonum* says that ‘*the crux of a faith-based approach is striking the right balance between prudent resource management to fund the mission of the investing entity and investing in a manner that is reflective of Catholic identity- its faith and mission. The first responsibility should not supersede the second. In other words, some investment instruments and forms of investment, due to their inherent characteristics, are unsuitable for combining the use of capital with the promotion of the common good – even if this means that investors lose out on the benefits (such as diversification) of such products.*”

*Mensuram Bonum* is worthy of careful reading in full.

---

**The Plunkett Centre is a centre of the Australian Catholic University,  
located at St Vincent’s Hospital, Sydney, Australia. Its partner hospitals are**

***St Vincent’s Public Hospital Sydney***

***St Vincent’s Private Hospital, Sydney***

***Mater Hospital Sydney***

***St Vincent’s Private Community Hospital Griffith***

***Calvary Healthcare***

***Cabrini Hospital Melbourne***

***Mercy Hospital Melbourne.***

**[www.acu.edu/plunkettcentre](http://www.acu.edu/plunkettcentre)**