From Galileo to embryos and narcotic drugs: the quest for the right to science

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Introduction: from Galileo to embryos

‘Foolish and absurd in philosophy, and formally heretical since it explicitly contradicts in many places the sense of Holy Scripture’ (Library of Social Science 2016). This was the conclusion reached in 1615 by the Roman Inquisition on Galileo Galilei’s heliocentrism. Using a telescope, Galileo had observed the moons of Jupiter and sunspots, and advocated a heliocentric solar system. He also conducted investigations in buoyancy and wrote on physics, but his research was considered a threat to established doctrines. Although the Counter-Reformation ended several centuries ago, scientific research continues to be perceived ‘politically’ as an activity that needs to be carried out within certain limits.

Scientific research is still often limited by seemingly ‘ethical’ arguments. Research on embryos, for example, has been prohibited in several countries, and restricted in others (such as the UK) in which it is legal. This restriction is not based on fears around what embryological science may find out, or fears around the applications of scientific discoveries in this area, but on allegedly ‘ethical’ and to some extent metaphysical or religious grounds (e.g. what it is that renders a life *a person*, and how entities that qualify as *persons* should be treated).

In this chapter I will consider the case of psychoactive substances and discuss how the ban on the personal consumption of these substances impacts on scientific research. We should note that the use of psychoactive substances is probably as old as humankind itself. Most of the oldest religions include in their rituals the use of substances that may have toxic effects on the individual: from wine to weed, from mushrooms to all sorts of alkaloids. For centuries, the relationship between the physical and the metaphysical has been accompanied by the consumption of herbs, plants and their derivatives. Those substances are also known by the generic term of ‘drugs’, which in English, at least, can also mean ‘medicines’. In fact most, if not all, of those substances can also have a medicinal use. However

widespread, many psychoactive substances are subject to an international control regime that urges governments to control their production, consumption and commerce, making these actions ‘criminal offences’ (art. 36 of the 1961 UN Single Convention on Narcotic Drugs – hereafter, the 1961 Convention).

Whereas it is widely accepted that psychoactive substances are used for medical purposes, or even to treat emotional disorders (e.g. psychotropic drugs are administered routinely to treat psychological and emotional disorders), allegedly moral judgement and ethical concerns, as well as legal restrictions, seem to change dramatically if, instead of seeking a cure, the ‘alteration’ of our consciousness is done just for the sake of it.

This chapter will focus mainly upon the prohibition of narcotics and other psychoactive substances, and its impact on science. I will discuss how international organisations, particularly the United Nations, have intervened over the years to regulate and control the use and distribution of psychoactive substances. There are three main international conventions that deal with psychoactive substances. The first is the one mentioned earlier (the 1961 UN Single Convention on Narcotic Drugs); two further conventions followed: the Convention on Psychotropic Substances 1971 and the Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances 1988. The first, the 1961 Convention, is the one that contains the tables of plants and derivatives that must be strictly controlled. The most problematic of these conventions is the first, because it is this that lists the banned substances, and thus causes the problems that are discussed in this chapter. I will thus focus on the 1961 Convention. We will see, however, that various UN documents contain contradictions and are open to looser and stricter interpretations, thus leaving individual states uncertain as to how to regulate the use of psychoactive substances.

I will show that the prohibitions relating to psychoactive substances can seriously hinder the progress of scientific research. As scientific advancement is regarded as a human right by the same treaties and documents that restrict the use of psychoactive substances, prohibition results in the violation of fundamental human rights, such as the right to science and to health.

There is another aspect worth noting: the case of drug prohibition is illustrative of how at times rules and laws, particularly restrictive ones, are based on dogma or on unsubstantiated fears (as happened in the case of Galileo), and fail to take into consideration the scientific evidence available, rather than being grounded, as they should be, on a dispassionate analysis of the issues at stake. This method of regulation is not confined to psychoactive substances; cloning and assisted fertilisation, to highlight other examples, at least in some countries, have been similarly regulated on shaky grounds. I will begin with a brief overview of the international responses to cloning because these responses have been in many respects similar to the international reaction to psychoactive substances; this will illustrate further how scientific

progress, and thus indirectly our health and welfare, are readily sacrificed in the name of empty ideals.

The case of cloning

At times, limits and prohibitions are dictated by the risks (real or perceived) of harm to someone (the research subjects, or other humans, or the environment); at other times, they appear rather to be based on more vague and even fanciful grounds. For example, as is well known, after the birth of Dolly the sheep in 1996, virtually all international organisations and institutions lined up to ban human cloning. In March 2005 the General Assembly of the United Nations finally approved a non-binding declaration calling on all UN member states to ban all forms of ‘human cloning’, including cloning for medical treatment, as incompatible with ‘human dignity and the protection of human life’ (United Nations News Centre 2005). The declaration also banned ‘genetic engineering techniques that may be contrary to human dignity’. It also called on states ‘to prevent the exploitation of women in the application of life sciences’ and ‘to protect adequately human life in the application of life sciences’. The document received the support of eighty-four out of 193 UN member states. It is important to note that this, and other similar documents, was not just a prohibition or moratorium on human cloning, but a clear expression of the ethical norms that should guide and limit scientific research.

The term ‘human cloning’, construed during the debate of the Sixth Committee of the General Assembly throughout 2005, included in its meaning both *therapeutic* and *reproductive* cloning. On the basis of this equivocation, some countries, such as South Africa, abstained at the United Nations in 2005, claiming that ‘therapeutic cloning was aimed at protecting human life and [is not], therefore, inconsistent with the Declaration’ (*The Hindu* 2005). The United States, which voted in favour of the declaration, stated that ‘any ban on human cloning should explicitly state that it does not prohibit the development of cell and tissue-based therapies based on research involving cloning technology to produce DNA molecules, organs, plants, tissues, cells (other than human embryos), or animals (other than humans)’ (United Nations News Centre 2005), and concluded that the United States believes that ‘nations should actively pursue the potential medical and scientific benefits of these scientific methods, which have already enabled researchers to develop innovative drugs to treat diseases’ (United Nations News Centre 2005).

The 2005 Declaration on Human Cloning followed the Universal Declaration on the Human Genome and Human Rights adopted by UNESCO in 1997. Both are non-binding statements. Nevertheless, the drafting process, and in particular the debate that accompanied the adoption of the declaration throughout 2004, happened at a time when the first promising results on

embryonic stem cell research were being published: this demonstrates how crucial and divisive scientific research can be for decision makers.

After the adoption of the 2005 statement, the international community addressed the issue of cloning again at a technical level thanks to the work of the International Bioethics Committee (IBC) of UNESCO, which dedicated four years of its work, until 2011, to the issue of the moral acceptability of scientific research on human cloning. The IBC advised that global dialogue would greatly benefit from efforts in the three following areas:

Terminology: frameworks and regulations should not make use of inaccurate and misleading terminologies that inadequately describe the technical procedures relevant to human cloning. The new scientific developments call for the redefinition and clarification of some widely used terms and for the dismissal of others.

International governance: the IBC considered that the existing international legal frameworks and regulations were unable to properly address the challenges posed by the most recent scientific developments. They are non-binding and mutually inconsistent as a result of different views of member states. A process should be initiated that could lead to the establishment of a more robust mechanism which should give more substantial guidance on the specific issue of cloning.

Dissemination: the IBC stressed the importance of fostering public awareness by disseminating, discussing and debating cloning issues at all levels. This would allow all countries, including the developing and least developed countries, to participate in the debate and put forward their concerns regarding the new technologies related to human cloning (UNESCO 2017).

The opposition to cloning, in any form, has been fierce, in spite of the international documents welcoming *therapeutic* cloning. The problem with any type of research of this kind is that it involves the manipulation of human embryos (of course, there is a question as to whether the entity that results from so-called cloning, that is, cell nuclear transfer, is an embryo in the same way as the entity that results from the fusion of male and female gametes). But leaving the technicalities aside, the idea that humans in scientific laboratories would create, manipulate, study and possibly destroy something that looks very much like a human embryo has been found unacceptable and repugnant to many.

As is well known, *therapeutic* cloning refers to the enucleation of an oocyte and the insertion of the nucleus of an adult cell into the enucleated oocyte. With certain types of electric stimulation, an embryo can be formed (or an entity that very much looks and functions like an embryo), in absence of a fertilised egg. This embryo would have DNA that would be nearly identical to the DNA of the donor of the nucleus of the adult cell (with the exception of the mitochondrial DNA that is inherited via the

oocyte). The embryo, after around five days, presents itself as a hollow cavity containing stem cells. These cells are highly *plastic*, that is, they have the ability to differentiate into many tissues, and could in principle be extracted and induced to differentiate into desired tissues, which could provide a cure for many diseases (Parkinson's disease, other neurodegenerative disorders, heart diseases and many others), free of problems of immunological rejection.

But the whole enterprise of embryological research, not only that aimed at producing 'clones', raises fierce opposition. By way of example, in 2013 a group of European organisations launched the 'One of Us' campaign to call on European institutions to unconditionally recognise 'the inherent and inalienable human dignity as a source of human freedoms and citizens' rights' (One of Us 2012–17). This 'federation' of NGOs collected 1,721,626 signatures from all over Europe to support their request to the European Commission to stop the European funding of research on embryonic stem cells. The 'citizens' initiative' (European Commission 2017) was submitted, discussed and rejected by the Commission in May 2014 (European Commission 2014). In a hearing convened to discuss the matter, Máire Geoghegan-Quinn, European Commissioner for Research, Innovation and Science, declared that

Member States and the European Parliament agreed to continue funding research in this area for a reason. Embryonic stem cells are unique and offer the potential for life-saving treatments, with clinical trials already underway. The Commission will continue to apply the strict ethical rules and restrictions in place for EU-funded research, including that we will not fund the destruction of embryos. (European Commission 2014)

The scientific community, the regulators and civil society organisations may have been caught unprepared for 'cloning', but it is likely that the farraginous regulatory systems in place, both nationally and internationally, often guided by ideologies and dogmas rather than by dispassionate reasoning, may have set back scientific advancement and research. The therapeutic potentials of human cloning are well known, and were already disseminated soon after the announcement of the birth of Dolly; in principle, cloning could provide treatment for a number of degenerative disorders (Kfoury 2007); thus, the costs of setbacks are to be paid, in likelihood, by real people, who could, at least in principle, have benefited from scientific advancements.

Narcotic drugs: their potential in science and medicine

The more we know about how the brain works, the better we can intervene – and even alter – its functioning. Part of this endeavour is of unquestioned value, especially when we talk about serious or currently incurable diseases. Not many questioned the initiative by President Obama to invest in the

so-called 'BRAIN' initiative, a 'research effort to revolutionize our understanding of the human mind and to uncover new ways to treat, prevent, and cure brain disorders like Alzheimer's, schizophrenia, autism, epilepsy, and traumatic brain injury' (National Institutes of Health 2017). In 2013 the European Commission similarly launched the Human Brain Project (HBP) to build a collaborative scientific research infrastructure based on information and communications technologies to allow researchers across the globe to advance knowledge in the fields of neuroscience, computing and brain-related medicine (Human Brain Project 2017).

Understanding brain functioning requires its observation 'under the influence' of some substance. The substance can be either endogenous or exogenous. Research into autism in children, for instance, might look at how the brain works during exposure and interaction with significant others; this research could attempt to verify brain changes in children affected by autism when, say, their mother enters the room and interacts with them. Exposure to the mother in most cases will cause the endogenous production of chemicals in the brain of the research subjects. Other research might investigate the role of psychoactive substances in the central nervous system and thus observe brain performance, say, in heroin addicts when they take their fix. The role of researchers in both cases is, or should be, observing, analysing and researching, and not making moral judgements about people's behaviour.

The study of psychoactive drugs could be crucial to the understanding of the human brain. David Nutt, former chair of the UK Advisory Council on the Misuse of Drugs, noted that research into the human brain would benefit from the study of substances that are currently prohibited or whose use is currently severely restricted. Nutt has examined the neural effects of mind-altering drugs, such as the hallucinogen psilocybin (an active ingredient in magic mushrooms); the study led to the first images showing the effects of lysergic acid diethylamide (LSD) on the human brain, as part of a series of studies examining how the drug causes its characteristic hallucinogenic effects. In an interview with *Nature* Nutt explained that his study revealed how LSD might ultimately be therapeutically useful, reminding us how in the 1950s and 1960s, thousands of people took LSD to cure alcoholism. A retrospective analysis of some of those studies in 2012 suggested that the drug helped recovery from alcohol addiction. Since the 1970s there have been several research studies of LSD in animals, but not in humans, and Nutt argued that it was important to validate the trial of this drug as a potential therapy for addiction or depression in humans (Cormier 2016). Research on psychoactive substances could also prove beneficial in finding a treatment for other conditions, such as autism and post-traumatic stress disorder (Multidisciplinary Association for Psychedelic Studies 2017). If this all sounds reasonable in theory, in practice the use of psychoactive substances, as was the case with 'cloning', has been virtually universally condemned.

International and national prohibitions on the use of psychoactive substances

As mentioned in the introduction, the scheduling, that is, the restriction, of potentially medicinal plants and their derivatives is the result of the ratification of three international conventions on ‘drugs’ adopted by the United Nations (United Nations Office on Drugs and Crime 2017) between the early 1960s and the late 1980s. In addition to being used to justify the so-called ‘war on drugs’, these documents have also created the general conditions for the limitation of research into narcotics, including research for scientific or medical purposes.

The incorporation of the 1961 Convention into the various national legal systems made the production and consumption of certain psychoactive substances a criminal offence; however, the Convention did not establish a court before which countries not in compliance with its provisions could be brought for breaching them. The 1961 Convention came into force in the mid 1970s, at a time when the international community was adopting the International Covenant on Civil and Political Rights (ICCPR) (1966) and the International Covenant on Economic, Social and Cultural Rights (ICESCR) (1966), two documents that finally expanded, clarified and codified the rights enumerated in the Universal Declaration of Human Rights of 1948.

Over the years, these last two covenants were strengthened by the creation of a committee (UN Committee on Economic Social and Cultural Rights 1996–2017), which was tasked with monitoring the domestic application of the covenants. This development of a compliance mechanism is a crucial difference from the UN conventions on narcotics, and signals the hierarchical relationship between the documents. While the articles of the two human rights covenants have constitutional status, obliging states, under international law, to protect and promote the rights contained therein, those of the three narcotics conventions are a set of shared recommendations that the international community believes should be applied to ensure an ‘international drug control system’; while there are two UN committees to address violations of the human rights contained in the covenants, there are no quasi-judicial bodies to assess how states enforce the norms contained in the three UN conventions on drugs. Because of their constitutional status, the rights in the covenants trump the provisions of the conventions.

The regulation of psychoactive substances has been a hard nut to crack for national governments as well. One example is provided by the saga of the regulation of cannabis in the UK. This case illustrates how even in countries where public opinion favours the legalisation of certain psychoactive substances, the response of the government may end up oscillating between decriminalisation and prohibition. In 2001, following a public survey, the British government announced that cannabis would be transferred from class B under the 1971 Misuse of Drugs Act to class C, thus decriminalising personal possession (arrest would still be possible for distribution).

Reclassification had the support of a majority of the public, with surveys at the time finding that 49 per cent of British adults supported cannabis decriminalisation, 36 per cent were against and 15 per cent were undecided. The rescheduling eventually happened in January 2004, after class C penalties for distribution had been stiffened.

The British Advisory Council on the Misuse of Drugs (1979) had already recommended such a reclassification as early as 1979, a view that was endorsed by the so-called Runciman Report in 1999 (Runciman 1999). The changes would have allowed police forces to concentrate resources on other more serious offences, including those involving 'stronger drugs'. However, in 2005 the government announced that the reclassification of cannabis from class B to class C would be reviewed in light of new scientific research, and the issue was, finally, formally referred to the Advisory Council.

In January 2006 the Home Secretary maintained that, based on advice from the Advisory Council, there would be no move to return cannabis to class B. A year and half later this decision was reconsidered. In fact, in May 2008 the government confirmed that cannabis in the UK would again be classified as a class B drug, despite the Advisory Council's recommendation. On 26 January 2009 cannabis was reclassified as a class B drug, once more making its possession and use a criminal offence.

A global war against the use of narcotics in scientific research

As the previous section has shown, national laws and international conventions virtually unanimously prohibit the recreational use of several psychoactive drugs. Whereas many of us are well aware of this prohibition, the effect that it might have on scientific research (and thus, indirectly, on human health) has not been widely recognised. In 2013 David Nutt, mentioned earlier, attempted to highlight the effects of these prohibitions on scientific research. In an article published in *Nature* he wrote:

The possession of cannabis, 3,4-methylenedioxy-N-methylamphetamine (MDMA; also known as ecstasy) and psychedelics is stringently regulated. An important and unfortunate outcome of the controls placed on these and other psychoactive drugs is that they make research into their mechanisms of action and potential therapeutic uses – for example, in depression and post-traumatic stress disorder – difficult and in many cases almost impossible. (Nutt et al. 2013)

Similarly, Ben Sessa, in an article published in the *Lancet* in January 2015, wrote:

For many people, words such as psychedelic and LSD (lysergic acid diethylamide) refer only to dangerous drugs of abuse . . . Less well known is that tens of thousands of patients were treated effectively with psychedelic drugs in the 1950s and 1960s and that these drugs had almost become part of mainstream

medicine by the time they became demonised and research was halted for 40 years. (2015)

Even in states in which the medicinal use of some psychoactive substances is recognised, the laws remain contradictory, and the result is an obstruction to scientific research. For example, in the United States, under federal law, twenty-eight states recognise cannabis as a medicine, and yet cannabis is treated like any other controlled substance, such as cocaine and heroin. According to its relative potential for abuse and its medicinal value, the federal government places every controlled substance in a schedule. As a matter of fact, the cannabis plant remains illegal under federal law. The federal government regulates drugs through the Controlled Substances Act (CSA) (21 USC para. 811), which does not recognise any difference between medical and recreational use of the plant. This Act is generally applied against persons who possess, cultivate or distribute large quantities of cannabis. Under the CSA, cannabis is classified as a Schedule I drug, which means that the federal government considers the plant and its derivatives as highly addictive and having no medical value. Doctors may not prescribe cannabis for medical reasons under federal law, but they can recommend it under the First Amendment. Somewhat paradoxically, the enjoyment of the right to health is possible thanks to ‘freedom of speech’ (Americans for Safe Access 2017).

It is easy to be appalled by some of the implications of the use and abuse of psychoactive substances (legal and illegal). Substance use claims thousands of lives every year: in 2015 in England and Wales alone, 3,674 drug-poisoning deaths were caused by both legal and illegal substances (Gayle 2016). In common discourse, illegal drugs are often associated with narco-trafficking, with disadvantaged young people caught in the net of the illegal drug trade through the promise of a better life; at the other end of the spectrum are highly privileged people, wealthy and fortunate but otherwise vulnerable, whose bodies are found lifeless after an overdose. Perhaps worst of all are the horrifying stories of toddlers being drugged and abused by their parents, or being drugged just for fun (Nauman 2016; Smith 2016).

These stories elicit sentiments of revulsion, which are so strong that it is easy to condemn psychoactive substances and support restrictive laws. The moral feelings of many suggest that abusive parents ought to be punished, that children ought to be protected and that young people in disadvantaged socio-economic contexts ought to be shielded from the exploitation of the illegal drugs trade. What is obscured, however, by the strong sentiment of revulsion is that prohibitionist policies do not effectively protect those who are vulnerable to addiction. The ‘war on drugs’ can end up claiming even more lives than the drugs themselves (an emblematic case is that of Mexico: a 2017 Congressional Research Service report by the United States on that country estimated that at least 80,000 people had been killed due to incidents related to organised crime since 2006. Under President Peña Nieto, overall

homicide numbers have declined as much as 30 per cent, according to experts, but Mexican drug cartels take in between \$19 and \$29 billion annually from US drug sales (CNN 2017)). Even in Europe, where governments do not implement active ‘wars on drugs’ as seen in Mexico, making drugs illegal is still ineffective. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA 2016) reports that thousands of lives are claimed every year in Europe due to the use of illegal psychoactive substances, and the rates do not appear to be decreasing.

So, if prohibitionist policies and laws are meant to protect people’s health and well-being, surely this means that health and well-being matter; but, if they matter, then there is a problem here, because prohibitionist policies result in an obstacle to scientific research, and this also compromises people’s health and well-being. One could object that psychoactive drugs are likely to cause immediate and real harm to those who take them, whereas the benefits of scientific research on psychoactive drugs are potential and thus hypothetical, and in making a choice between reducing a real harm and producing a hypothetical benefit, it is rational to reduce the real harm. However, it is not clear that prohibitionist policies effectively protect people from the harm of psychoactive drugs, as we have seen.

Prohibitionist policies around narcotics and other psychoactive substances limit scientific research into drugs, thus hindering the understanding of how human brain reacts to certain substances, and thus how certain substances can be safely used as therapies or even recreationally.

The United Nations on narcotics and science: conflicting goals?

As we have seen, there are inconsistencies in several United Nations documents. Whereas the 1961 Convention prohibits the use of narcotics, other covenants affirm the importance of scientific progress, and state that science is *a human right*. Thus the prohibition of the use of narcotics, which impinges upon scientific advancement, jeopardises the full enjoyment of a human right.

Article 15 of the ICESCR (1966) stipulates, among other things, that the ‘States Parties to the present Covenant recognise the right of everyone: (b) To enjoy the benefits of scientific progress and its applications; (c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author’. Key to this article is the ‘conservation, the development and the diffusion of science and culture’.

The United Nations Universal Declaration on Human Rights adopted on 10 December 1948 had already suggested that scientific research is a *human right*. Article 27 stated that ‘(1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.’ Imposing a strict system of control on scientific research into certain plants or substances without any solid justification arguably violates the human right to scientific advancement.

Consonant with the idea that scientific advancement is a human right, the ICESCR (1966: art. 15 (5)) calls on states to do their utmost to ‘undertake to respect the freedom indispensable for scientific research and creative activity’. It also states that all countries party to the pact should ‘recognize the benefits to be derived from the encouragement and development of international contacts and co-operation in the scientific and cultural fields’ (1966: art. 15 (6)). It took twelve years to draft the version of the ICESCR that was adopted on 16 December 1966, and another decade passed before its coming into force on 3 January 1976. Over the years, 164 states have become party to the covenant, and in 2008 an Optional Protocol was concluded, which entered into force in 2013, allowing its parties to recognise the competence of the Committee on Economic Social and Cultural Rights (CESCR) to consider complaints from individuals. The committee consists of eighteen independent human rights experts that meet three times a year at the United Nations.

The ICESCR is the twin of the ICCPR, and was the result of a diplomatic compromise to satisfy the ideological approaches of the two main blocs during the Cold War – individual rights were considered crucial for the West, collective ones for the USSR and its allies. With the fall of the Soviet Union, this separation has blurred, paving the way for the drafting of other international documents that deal with health and scientific research, such as the United Nations Convention on the Rights of Persons with Disabilities, which entered into force in 2008; and, within the Council of Europe, the Convention on Human Rights and Biomedicine of 1997 (also known as the Oviedo Convention), which aims at the protection of ‘Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine’, and which entered into force in 1999. Once ratified, the covenants become documents of constitutional value.

In its Preamble, the ICESCR (1966) reminds signatories that the ‘individual, having duties to other individuals and to the community to which he belongs, is under a responsibility to strive for the promotion and observance of the rights recognized in the present Covenant’. Alas, as we have seen, over the last few decades, in particular in the field of health and science, ‘striving for the promotion and observance’ of Article 15 of the ICESCR has found potent enemies in other international treaties or declarations to control the diversion of substances to purposes other than their scientific or medical use.

The 1961 Convention contains (as arguably do all compromise documents) several contradictions and several ambiguous statements that have allowed rigid or lax interpretations in different countries. Examples of some inherent incongruences can be found in the Preamble of the document:

The Parties,

Concerned with the *health and welfare of mankind*,

Recognizing that the medical use of narcotic drugs continues to be indispensable for the relief of pain and suffering and that adequate provision must be made to ensure the availability of narcotic drugs for such purposes,

Recognizing that addiction to narcotic drugs constitutes a serious evil for the individual and is fraught with social and economic danger to mankind,

Conscious of their duty to prevent and combat this evil,

Considering that effective measures against abuse of narcotic drugs require co-ordinated and universal action,

Understanding that such universal action calls for international co-operation guided by the same principles and aimed at common objectives. [emphasis added]

The 1961 Convention opens up with a solemn statement of concern for the *health and welfare of mankind*, which among other things depends on adequate access to essential medicines; at the same time, mankind must be defended from the ‘evil’ of ‘misuse’ of those medicines. Whereas these resounding statements are eye-catching, what constitutes a possible abuse of controlled substances is arbitrarily defined. In fact, contrary to Paracelsus’ dictum that ‘the dosage makes it either a poison or a remedy’, there are no annexes to the United Nations conventions on drugs to specify the quantity of alkaloids that can be considered as intoxicating or dangerous. A decision on the welfare of mankind was thus taken that left scientific and medical arguments aside.

Of course, one may question whether there is such a thing as a ‘right to science’; indeed the relationship between science, democracy and the rule of law raises the more fundamental question of whether there is such a thing. Boggio and Romano (Chapter 10 in this volume) have extensively reported on this issue, and on how individual states and governments may be able to claim further freedom in cases in which it is believed that such a right is being violated. Mikel Mancisidor, vice-chair of the Committee on Economic Social and Cultural Rights, argues that ‘the Human Right to Science does in fact present as a true human right in existing International Law, even if its binding normative content still has to be clarified and better specified’ (2015). ‘The Human Right to Science’, he continues, ‘is a right that has been explicitly enshrined in the 1948 Universal Declaration (UD) (art. 27) and in the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR, art. 15). We are not therefore in any way dealing with a new legal right’ (2015).

However, he notes that this right ‘is relatively unknown even among Human Rights experts and activists’ and that it has ‘generally been overlooked by international bodies and also by states’ (2015). Moreover, within the mechanisms created by the United Nations, states often do not report satisfactorily, as should be their obligation, on rights that, like this one, fall under the category of ‘cultural rights’. The other problem is that the United Nations has not provided individual states with guidelines or recommendations on how to implement the ICESCR on scientific matters.

In spite of all these limitations, the right to science is no less recognised and important than the right to health or the right to life. One may question

the existence or moral significance of human rights altogether, but if and insofar as supranational organisations and individual states accept the value, moral and political meaning of human rights, such as the rights to health, to life, to education and so on, then they should also accept the value and moral and political meaning of other rights ratified by the same covenants, unless a significant difference were found that justified attaching lower importance to one particular human right.

It thus appears that international documents ratified to guide states in the regulation of the use of psychoactive substances incorporate conflicting or openly contradictory aims. On the one hand, they declare the importance of scientific progress for the welfare of mankind; in fact, not merely its *importance*: they explicitly state that scientific advancements and human health are fundamental *human rights*. On the other hand, they readily ban certain psychoactive substances whose use in scientific research could be vital to scientific progress on the functioning of the human brain, and thus to the protection and promotion of those same human rights.

Conclusion: research on narcotics as a concrete case for the right to science

The spectacular leap forward that the scientific world is expected to produce in the study of the human brain makes drugs, in particular those that are currently controlled by the three United Nations conventions on narcotics, one of the battlegrounds where current international and domestic policies pose a potent threat to the affirmation of the human right to science. Obviously, a right to science presupposes and implies that scientists ought to be free to do their job – in short, it presupposes a significant degree of freedom of scientific research. The case of narcotics and other psychoactive substances is one of many instances in which decision makers, through laws and policies, have imposed arbitrary limits to the freedom of scientific research, thereby hindering the full enjoyment of fundamental human rights.

Looking at what happened to Galileo, or even at recent events relating to research on human embryos, one might hope that it is only a matter of time before laws and policies will become more liberal, and research into drugs will be authorised and given the necessary public investment. Those countries that act first will have a significant advantage both in terms of public health and of economic opportunities, as it is certainly possible that the more we know about how the brain works, the more we will be able to control and ameliorate human life. The next few years will put the policymakers of the so-called Western liberal democracies to the test; their challenge is to rethink current prohibitionist policies and law, while also taking account of the fact that research into drugs does happen – most likely in the hands of organised crime, which constantly produces ever more powerful and more addictive substances, purposely created and distributed simply to maximise its own profit.

The danger of not loosening regulations on scientific research into controlled substances is therefore wide-ranging. It increases the chances of illegal trade, of illegal and dangerous research at the hands of dubious companies or organised crime, and it is an impediment to crucial discoveries that could lead to effective treatments for many diseases. In addition to this, there is also a general risk that democracy will suffer a heavy defeat, as overly restrictive national policies on drugs put into question the real nature of the democratic liberal model based on civil liberties (on the relationship between democracy and scientific freedom, see Chapter 13 in this volume).

Strengthening international instruments and mechanisms to affirm the right to science, and to free up the use of narcotics and other psychoactive substances in respectable scientific laboratories, could thus contribute both to science and to the protection of human rights, democracy and the rule of law.

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