



UNIVERSITÀ
DI TRENTO

Facoltà di
Giurisprudenza

TRENTO E LA COMPARAZIONE GIURIDICA:
VOCI, ESPERIENZE, RIFLESSIONI.
DALLA TESTIMONIANZA DI RODOLFO SACCO
E MAURO CAPPELLETTI

a cura di
LUISA ANTONIOLLI
FULVIO CORTESE
ELENA IORIATTI
BARBARA MARCHETTI

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PARTE SECONDA

AT THE CROSSROAD OF COMPARATIVE LAW:

THE RELATIONSHIP OF LAW WITH OTHER SCIENCES

A BRIEF INTRODUCTION

Carlo Casonato

1. Introduction

The issues connected to the theme of the session “At the Crossroad of Comparative Law: the Relationship of Law with Other Sciences” are multiple and complex. In this introduction, I will address a few of them, that will be briefly analysed within two more general frameworks. Firstly, I will deal with the variables and complexity that characterize the topic, and secondly, I will describe a few ingredients that can help achieving a good relationship between law, comparative law in particular, and other sciences.

2. Variables and complexity: law and other sciences

The relationship of law with other sciences is complicated and depends on many variables¹. Which idea of law are we referring to, in the first place? And within the legal phenomenon, which formants do we want to consider (statutory law, judicial rules, or legal doctrine, according to Sacco’s basic categories)², or which fluxes do we choose to examine (to use another category mentioned in the previous papers)?

2.1. Statutory law

Regarding statutory law, we can first identify specific institutional channels established in many countries to connect legislators with sci-

¹ Among others, R. FELDMAN, *The Role of Science in Law*, Oxford, 2009.

² R. SACCO, *Legal Formants: A Dynamic Approach to Comparative Law*, in *The American Journal of Comparative Law*, 1991, pp. 1-34.

entific expertise and to incorporate scientific evidence into the decision-making process.

A case in point is the Parliamentary Office for Science and Technology (POST), a bicameral body of the British Parliament. Since 1989, POST has been publishing and making impartial and up-to-date scientific reports accessible to Westminster and its committees. These reports cover a wide range of topics from biology to health, from energy to the environment, from physics to information technology³. A similar role is played today in the USA by the White House Office of Science and Technology Policy (OSTP). Established in 1976, OSTP provides advice to the President and his Executive Office on matters related to science and technology, seeking to provide the best possible guidance and to coordinate the Federal science and technology policy⁴. In January 2021, President Biden established a new *Council of Advisors on Science and Technology* (PCAST). The explicit intention of this Council is to allow the Federal administration «to make evidence-based decisions guided by the best available science and data»⁵.

Another example of a channel designed to provide legislators with scientific knowledge, while incorporating an extra ingredient of participatory democracy on sensitive subjects, is the French *États Généraux*

³ See <https://post.parliament.uk/>. POST was created following the example of the short-lived US Office of Technology Assessment (OTA). OTA was a mixed body of both technical and political composition, created in 1974 to provide members of Congress and their committees with objective and authoritative information on the most complex scientific and technological issues of the time. Criticised for being redundant, too expensive, and biased, OTA saw its funding, and its activities, cease in 1995.

Cfr. B. BIMBER, *The Politics of Expertise in Congress: The Rise and Fall of the Office of Technology Assessment*, New York, 1996; J. SADOWSKY, *Office of Technology Assessment: History, implementation, and participatory critique*, in *Technology in Society*, 2015, pp. 9-20; D. LAMBRO, *Fat City: How Washington Wastes Your Taxes*, South Bend, 1980.

⁴ See <https://www.whitehouse.gov/ostp/>.

In general terms, the *National Academy of Sciences* (NAS) publishes materials often used in the legislative decision-making process: see, in Italian, A. IANNUZZI, *Il diritto capovolto*, Napoli, 2018, pp. 149 ff.

⁵ S. PENASA, *The role of scientific advisory bodies and Biden administration: A laboratory for an evidence-based decision-making process?*, in *DPCE online*, Special issue, 1, 2023, pp. 333-344.

de la bioéthique. Before each amendment of the *Loi de bioéthique*, which must be considered for parliamentary review every seven years, a specific popular consultation is activated. Article 46 of the 2011 *Loi de bioéthique* states:

Tout projet de réforme sur les problèmes éthiques et les questions de société soulevés par les progrès de la connaissance dans les domaines de la biologie, de la médecine et de la santé doit être précédé d'un débat public sous forme d'états généraux.

In this way, any amendment to ethically sensitive and scientifically complex laws is preceded by consultation with both the society at large and specialized scientific and professional associations⁶.

In addition to stable and broad-spectrum institutional channels, some legal systems provide for other tools designed on a specific and ad hoc basis, intended for parliamentary advice on particular subjects.

For instance, the British regulation on the donation of mitochondrial material (*Human Fertilisation and Embryology (Mitochondrial Donation) Regulations 2015*) was enacted after a series of contributions aimed at obtaining both scientific information and ethical opinions for Westminster. Before being passed, the regulation was reviewed three times by the Human Embryology and Fertilisation Authority (in 2011, 2012, and 2014) and the Nuffield Council on Bioethics⁷. Similarly, the

⁶ The most recent *États Généraux*, convened from January to June 2018, covered nine topics: reproduction and embryonic development, genetic engineering and predictive medicine, organ donation and transplantation, health data and privacy, robotics and artificial intelligence, neuroscience, health and the environment, procreation, end-of-life. See <https://www.etatsgenerauxdelabioethique.fr/>. There is no agreement on the concrete and substantial effectiveness of the *États Généraux*. Nonetheless, the French experience remains relevant, also from a symbolic point of view, on the formalisation of the channels through which scientific data and social assessments directly related to scientific and biotechnological innovations were submitted to Parliament (upstream), also in order to increase the legitimacy of the law (downstream).

⁷ S.A.M. McLEAN, *Mitochondrial DNA Transfer. Some Reflections from the United Kingdom*, in *BioLaw Journal - Rivista di BioDiritto*, 2, 2015, pp. 81-88.

1990 *Human Fertilization and Embryology Act*, amended in 2008, was drafted following the 1984 *Warnock Report*⁸.

In Spain, to give another example, the *Ley 35/1988* established the *Comisión Especial de Estudio de la Fecundación in vitro y la Inseminación Artificial Humana* (also known as the *Comisión Palacios*). Although composed by MPs, the Committee bases its work on a number of technical reports, obtained through the official hearing of doctors, geneticists, lawyers and philosophers.

In Italy, there are no institutional channels similar to the mentioned ones, apart from parliamentary hearings which, for a variety of reasons, do not effectively test the scientific sustainability of draft bills. Unfortunately, this failure is often evident in the lack of technological and scientific robustness of laws, which must be declared downstream by the Constitutional Courts. A case in point is the *Legge n. 40 del 2004*, on *Assisted Reproductive Technology (ART)*, whose incompatibility with scientific evidence had to be declared by the Constitutional Court, which had to essentially redesign the entire structure of the law⁹.

2.2. Case law

The need for openness of the law to science and its results, moving to the second formant mentioned, is also often felt in case-law and judicial rules¹⁰. In some extreme cases, the relationship between case-law and science is assured by the very composition of the court, with scientists sitting alongside ordinary judges. In this perspective, the so-called Green Courts have been established in a few countries with a special jurisdiction on environmental issues. One of the most important and well-known examples is the National Green Tribunal (NGT) of India,

⁸ M. WARNOCK, *A Question of Life. The Warnock Report on Human Fertilization and Embryology*, Hoboken, 1985.

⁹ Cfr., in Italian, S. PENASA, *La legge della scienza: nuovi paradigmi di disciplina dell'attività medico-scientifica. Uno studio comparato in materia di procreazione medicalmente assistita*, Napoli, 2015.

¹⁰ In general, A. SANTOSUOSSO et al. (eds.), *Science, Law and the Court in Europe*, Como, 2004.

set up in 2010¹¹, but envisaged already in the '80¹². Following the special composition of the Tax Courts, some scholars advocate for the establishment of Green Courts also in the USA, and some court rulings stated, more generally, as follows: «Substantive review of mathematical and scientific evidence by technically illiterate judges is dangerously unreliable»¹³. Considering the scientific complexity of artificial intelligence (AI) and the societal impact of its deployment, a special jurisdiction might also be conceived for ad hoc AI Courts. For example, the United Arab Emirates established in 2021 a specialized court to handle cases related to emerging technologies. The Digital Economy Court Division oversees complex national and transnational disputes related to current and emerging technologies across areas ranging from big data, blockchain, AI, fintech and cloud services, to disputes involving unmanned aerial vehicles, 3D printing and robotics¹⁴.

Without going to these extreme examples, it is common for technical experts or science panels to assist judges in bridging the gap between the judiciary and science¹⁵. These tools can help connect case-law with other sciences, although the actual outcome of the deci-

¹¹ E. CHATURVEDI, *Green Courts: The Way Forward?*, in *The Cornell Policy Review*, 2022: at <http://www.cornellpolicyreview.com/green-courts-the-way-forward/?pdf=3102>; D. AMIRANTE, *Environmental Courts in Comparative Perspective: Preliminary Reflections on the National Green Tribunal of India*, in *Pace Environmental Law Review*, 2012, pp. 440-469.

¹² In a 1986 case (*M. C. Mehta v. Union of India*, (1986) 2 S.C.C. 176), the Supreme Court of India wrote as follows: «[S]ince cases involving issues of environmental pollution, ecological destruction and conflicts over natural resources are increasingly coming up for adjudication and these cases involve assessment and evolution of scientific and technical data, it might be desirable to set up Environmental Courts on a regional basis with one professional Judge and two experts drawn from the ecological sciences research group keeping in view the nature of the case and the expertise required for adjudication».

¹³ *Ethyl Corp. v. Environmental Protection Agency*, 541 F.2d 1, 67 (D.C. Cir. 1976) (Bazelon, C.J., concurring).

¹⁴ In 2022, the Courts issued a judgment related to one of the first cryptocurrency litigation disputes in the region, addressing the safe transfer and custody of cryptocurrency: <https://mediaoffice.ae/en/news/2022/December/14-12/DIFC-court>.

¹⁵ Among others, in Italian, G. RAGONE, *Eine empirische Wende? La Corte costituzionale e le sfide della complessità tecnico-scientifica*, Torino, 2020.

sions largely depends on the particular judicial philosophy of judges. Therefore, even when instruments enabling judges to decide with full knowledge of scientific data are available, case-law often remains diverse and contradictory. In this respect, recent US federal constitutional case-law on scientifically-based issues has yielded discouraging results. The USA is where the theme of the relationship between law and other sciences was born and developed with great attention, fuelling a rich and lasting dialogue between the main legal formants: Constitution, statutes, case-law, and scholarship. Books such as S. Jasanoff's *Science at the Bar* (1997), laws such as the *Inflation Reduction Act* of 2022, and rulings such as *Chevron* (1984) bear witness to this¹⁶. Nevertheless, today, the Federal Supreme Court is making decisions that may be easily considered contrary to scientific evidence. Looking at the combined rationale of *Dobbs v. Jackson Women's Health Organization* on the right to abortion¹⁷, *New York State Rifle and Pistol Association v. Bruen* on gun control¹⁸, and *West Virginia v. EPA* on environmental protection¹⁹, all issued on June 2022, the journal *Nature* published an editorial whose title is very explicit: *Inside the US Supreme Court's war on science*²⁰. In its decision overturning the right to abortion, for example, the Court «ignore[d] more than a century of the nation's early history, when abortion in the first three or four months of pregnancy was tolerated», dismissing «decades of research indicating that its decision would negatively affect women's health and increase long-standing disparities in the health system». And in *West Virginia v. EPA*, it disregarded «decades of climate science on the looming peril of global warming». Also because of the three Donald Trump appointments, today's Supreme Court is «an ultraconservative, six-member superma-

¹⁶ See S. JASANOFF, *Science at the Bar. Law, Science, and Technology in America*, Cambridge, 1997; *Inflation Reduction Act* of 2022; *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984).

¹⁷ *Dobbs v. Jackson Women's Health Organization*, 597 U.S. (2022).

¹⁸ *New York State Rifle and Pistol Association v. Bruen*, 597 U.S. (2022).

¹⁹ *West Virginia v. the Environmental Protection Agency*, 597 U.S. (2022).

²⁰ J. TOLLEFSON, *Inside the US Supreme Court's war on science*, in *Nature*, 609, 2022, pp. 460-462: <https://www.nature.com/articles/d41586-022-02920-4>, from which the following quotations.

jority that is often sceptical of – if not outright hostile towards – science».

At the antipodes of this approach, it is possible to mention, among others, the Italian Constitutional Court. In an essentially steady case-law, the Court has repeatedly ruled on scientifically relevant issues, developing what could be called a scientific rationality or reasonableness test²¹. Using this standard, the Court of Rome declared, for example, the unconstitutionality of a regional law on psychosurgical interventions because the legislator disregarded scientific findings:

An intervention on the appropriateness of therapeutic choices could not result from purely political discretion on the part of the legislature itself, but should provide for principles based on scientific knowledge and experimental evidence, acquired by institutions and bodies – national or supranational – designated for this purpose, given the ‘essential importance’ that, for these purposes, the ‘technical-scientific bodies’ have²².

Ruling on ART, and in particular on the legitimacy of creating a maximum of three ovocytes combined with the obligation to implant them all at the same time, the Italian Constitutional Court reaffirmed that:

it is important to point out that the case law of the Constitutional Court has repeatedly emphasised the limits placed by scientific and experimental knowledge on legislative discretion, which are continuously developing and on which the medical state of the art is based²³.

²¹ In general, see the contributions collected in G. BONGIOVANNI, G. SARTOR, C. VALENTINI (eds.), *Reasonableness and Law*, Dordrecht-Heidelberg-London-New York, 2009.

²² It. Const. Court, dec. n. 282/2002. See <https://www.biodiritto.org/Dossier/Lost-found-in-translation/Italian-Constitutional-Court-decision-n.-282-2002-therapies-of-proven-efficacy-and-informed-consent>.

²³ It. Const. Court, dec. n. 151/2009. See https://www.cortecostituzionale.it/documenti/download/doc/recent_judgments/CC_SS_151_2009_EN.pdf. In Italia, see S. PENASA, *La legge della scienza: nuovi paradigmi di disciplina dell'attività medico-scientifica*, cit.

And dealing with the constitutionality of the compulsory vaccination for prevention of SARS-CoV-2 infection for health care workers, the Court has recently confirmed its task of evaluating legislation on the basis of «the appropriate consideration of available scientific findings» (scientific rationality or reasonableness test)²⁴.

3. *Variables and complexity: other sciences and the law*

The above underlines the variables and complexity that law has to deal with when ruling on subjects with a specific scientific relevance (in particular hard sciences). Variables and complexity emerge also on the other component of the relationship, though – on the kind and specific features of the ‘other science’ which is involved.

Also on this side, certainty is rare and highly nuanced. Depending on which ‘other science’ we have to deal with, for example, outcomes with very different degrees of reliability and robustness occur. For instance, in meteorology extreme events, which can cause significant harm in terms of fatalities and material damage, can be predicted with varying margins of certainty. However, many Countries face difficult legal issues regarding the liability of researchers and scientists when they fail to provide timely warnings of catastrophic events, such as earthquakes or major floods²⁵. Other sciences can produce outcomes and projections with a relatively higher degree of certainty. Surprisingly, this is sometimes the case in fields such as biology or genetics. We know now, for instance, that mitochondrial transfer has proven to be a safe practice, even though the baby born after the procedure has DNA derived not from two, but from three parents. Advanced genome editing techniques, such as CRISPR-Cas 9 or Prime Editing²⁶, have been shown to be relatively safe on already formed organisms, but their use

²⁴ Dec. n. 14/2023.

²⁵ See, for example, K. JIYOUN et al., *To Warn or Not to Warn: Factors Influencing National Weather Service Warning Meteorologists’ Tornado Warning Decisions*, in *Weather, Climate, and Society*, 2022, pp. 697-708.

²⁶ Genome editing is a type of genetic engineering in which DNA is inserted, deleted, modified, or replaced in the genome of a living organism.

on developing beings, particularly human beings, is still very uncertain and potentially dangerous²⁷. Medicine is also firm in some areas, to the extent that the Italian Constitutional Court – as seen above – has developed the principle of scientific reasonableness, which states that a law is unconstitutional if it does not consider (sometimes if it does not respect) the shared results of scientific literature, by imposing unsafe treatments or preventing beneficial ones.

Concluding this section, it is easy to see that the relationship between law and other sciences is not a simple one, given the various variables, differences, and correlations involved. It can be complicated, uncertain, and at times confusing. Additionally, it is not easy to manage this relationship, because different sciences and researchers use varying terminologies, categories, and methodologies.

4. Ingredients for a good relationship? The three Ts

Despite the difficulties highlighted above, there are some ingredients that can help the law to address, and perhaps solve, the problems mentioned. Among them, I can list the the three *Ts*: the law must be Tuned, Timely, Tailored.

4.1. Tuned law (science and society)

Regarding the first T, a Tuned law means that the law must be open to the consideration and recognition of scientific evidence, as mentioned above. Comparative law provides some practical examples of how this can be achieved. In addition to aligning with scientific progress, the law must also be open and receptive also to the diverse views

²⁷ Chinese scientist He Jiankui had to serve three years in jail, lose his funding and his research position, discrediting the technique in general. See National Academy of Medicine, National Academy of Sciences, and the Royal Society, *Heritable Human Genome Editing*, The National Academies Press, 2020 (https://nap.nationalacademies.org/login.php?record_id=25665); S. MALLAPATY, *Disgraced CRISPR-baby scientist's 'publicity stunt' frustrates researchers*, in *Nature*, 12 Feb 2023: <https://www.nature.com/articles/d41586-023-00382-w>.

and reactions that scientific discoveries produce in society. This means respecting the dynamic and pluralistic nature of society. When dealing with the legal phenomenon vis à vis scientific issues, whether as researchers, legislators, or judges, we must give due weight to the other components of our social living, for various reasons.

The most recent scientific and technological outcomes often raise highly sensitive, divisive, and controversial questions. For instance, in the case of genetic engineering, one may argue that allowing people to be genetically immune to diseases is legally permitted and even desirable, while another may see it as the first step towards a new form of eugenics. Organoids and mini-brains are also highly controversial scientific applications²⁸. For example, the cells used at Stanford for in vitro culture are human stem cells, that allow the study of the development of diseases like autism or Alzheimer. Although much smaller, cerebral organoids behave similarly to real human brains²⁹. The problem, of course, is defining these mini-brains, determining who they belong to, and addressing the question of whether their development is advanced enough to generate human consciousness (or something similar). AI is another example of the controversial nature of innovative science applications, particularly in its potential to replace human decisions in fields such as security, predictive policing, medicine, and even justice. The use of ChatGPT in various domains has fuelled an already heated debate³⁰. Can a judge use it?³¹ Would an algorithmic judge or a robotic jury deliver justice? What about the Magna Carta requirement

²⁸ Cerebral organoids are artificially grown, in vitro, miniature organs resembling the brain. They are created by culturing pluripotent stem cells in a three-dimensional bioreactor. See, among others, O.L. EICHMÜLLER, J.A. KNOBLICH, *Human cerebral organoids – a new tool for clinical neurology research*, in *Nature Reviews Neurology*, 2022, pp. 661-680.

²⁹ S. REARDON, *Lab-grown ‘mini brains’ produce electrical patterns that resemble those of premature babies*, *Nature*, 22 November 2018, 563, pp. 453.

³⁰ Among others, L. FLORIDI, *AI as Agency without Intelligence: on ChatGPT, large language models, and other generative models*, in *Philosophy and Technology*, 2023: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4358789.

³¹ See the article published in *The Guardian*, 3 Feb 2023: *Colombian judge says he used ChatGPT in ruling*: <https://www.theguardian.com/technology/2023/feb/03/colombia-judge-chatgpt-ruling>.

of a lawful judgment of our peers? What about the common constitutional principle that «Justice is administered in the name of the people»? Will a robot, no matter how intelligent, ever be considered our peer, and will it ever speak for the people?³²

All these topics are inherently controversial, sensitive, and divisive. They are connected to different *Weltanschauungen* and tend to divide societies, politics, communities, and cultures. Therefore, a key feature that the law must consider when regulating other sciences and their technological applications is their ethical divisiveness. In order to address this, the law needs to be opened up to accommodate the plurality and diversity of different positions in society.

Moving from the relationship of law with ‘hard sciences’ to other humanities, and turning to the contributions collected here, Roberta Aluffi presents a paper on the importance of the relationship between law and religion, while Anne Griffiths advocates for the adoption of a more socially oriented approach to law. In this perspective, returning to the concept of ‘tuned law’, we need a law that is in harmony with the different social components, as well as with scientific innovations and new technological applications. Along these lines, we should also remember the formula of the ‘evidence-based law’³³.

4.2. *Timely law*

The second ingredient that can be added to law to improve its relationship with other forms of knowledge is the ‘time factor’. Science produces outcomes that are constantly tested, specified, and not so rarely proven wrong by subsequent studies. Along with technology, it de-

³² In Italian, C. CASONATO, *Intelligenza artificiale e giustizia: potenzialità e rischi*, in *DPCE online*, 3, 2020, at <https://www.dpceonline.it/index.php/dpceonline/article/view/1082>. In general, S. PENASA, *Intelligenza artificiale e giustizia: il delicato equilibrio tra affidabilità tecnologica e sostenibilità costituzionale in prospettiva comparata*, in *DPCE online*, 1, 2022: <https://www.dpceonline.it/index.php/dpceonline/article/view/1574>.

³³ In Italian, C. CASONATO, *Evidence Based Law. Spunti di riflessione sul diritto comparato delle scienze della vita*, in *BioLaw Journal - Rivista di BioDiritto*, 1, 2014, pp. 179-208.

velops rapidly and in a nonlinear manner. What may have seemed certain and safe in the field of medicine yesterday can become unclear and risky today, and vice versa. Autonomous vehicles, to make another example, do not have the capability for true self-driving and drivers are always held liable for car accidents. However, in the future, cars could become fully autonomous, and the liability regime would have to change accordingly. When discussing the relationship between law and other sciences, we must consider that the latter are fast-moving and change very quickly. Therefore, we must conceive of a law that can adapt to such changes. As the Italian Constitutional Court has stated

it is undeniable that any law developed on the basis of medical-scientific knowledge is by its very nature transient, because it is adopted in the state of knowledge at the time and is destined to be superseded as a result of medical-scientific evolution³⁴.

The law must, therefore, be able to react quickly and keep pace. Otherwise, it will soon become obsolete and ineffective.

The first problem in this regard is that the political decision-making process (particularly in such controversial matters) is slow and requires difficult and time-consuming negotiations. As a result, the law may be enacted too late, when the object being regulated has already changed. Moreover, another problem arises: the constitutional principles of predictability and certainty respond to equality stability and continuity, which are antithetical to continuously changing laws. Therefore, there is a conflict between legal certainty on the one hand, and the need to have laws that are current and up-to-date on the other. This challenge is not new, as Roscoe Pound wrote back in 1923, «Law must be stable, and yet it cannot stand still»³⁵.

Comparative law can also be helpful in suggesting ways to resolve these contradictions. For example, the mentioned French *Lois de Bioéthique*, in this regard, must be reconsidered by the Parliament at least every seven years. Stronger examples include the use of ‘sunset clauses’ and ‘experimental legislation’, which are acts with an expiration

³⁴ Dec. n. 14/2023.

³⁵ R. POUND, *Interpretations of Legal History*, Cambridge, 1923.

date after which they are no longer in force. Israel and Rhode Island have employed this strategy for regulating genetic engineering and reproductive cloning, while Switzerland has done the same for complementary and alternative medicine³⁶.

4.3. Tailored law

When working with other sciences, we also need a law which is narrowly tailored to fit the peculiarities of the specific object to be regulated. Here, again, we have to balance two opposite needs: the generality of the law and the respect for equality, on the one hand, and attention to the particular characteristics of the object to be regulated, on the other.

As a matter of fact, every single scientific innovation and technological application is different from all the others and raises particular issues that are hardly common. Differences from case to case are very relevant, and they can be hard to detect, and may be due to small elements or nuances. Cloning by parthenogenesis is different from cloning by somatic cell nuclear transfer, for instance, so much so that the former can also be patented in the human sphere, unlike the latter. Totipotent embryonic stem cells, which can give rise to all types of cells that make up the body, are different from pluripotent stem cells, which cannot form all cell types in the body. It is not easy to distinguish a vegetative state from a minimally conscious state, but the difference in the definition of futile treatment or in the possibility to give informed consent is relevant. A general regulation on the appropriate use of AI in predictive justice may be totally irrelevant or counter-productive if applied in medicine. And even in medicine, AI's role in diagnosis may be much more useful than in the doctor-patient relationship.

In short, other sciences and their technological application are full of small differences and nuances that make a big difference in their regulation. Nevertheless, these differences, sometimes hard-to-detect, make it very difficult to find an appropriate regulation through broad principles or even through parliamentary acts, which are general and abstract

³⁶ S. RANCHORDÁS, *Sunset Clauses and Experimental Regulations: Blessing or Curse for Legal Certainty?*, in *Statute Law Review*, 1, 2014, pp. 28-45.

by definition. From this perspective, the law must recognize and take into account these differences, so as not to compromise the suitability and proportionality of the regulation, with general and inaccurate rules. But while attentive and tailored, the law must maintain a level of generality that allows it to respect the principle of equality. Here, it is possible to consider a tailored law or a variable-geometry law, that can distinguish different cases and different objects and rule on them accordingly, while remaining rational and reasonable. Several countries belonging to both common law and civil law try to achieve this result through different means. In the UK, for example, the Human Fertilisation and Embryology Authority, according to the Human Fertilisation and Embryology Act 2008, performs such an important range of functions, including publishing a Code of practice, as to be understood as a kind of technical co-legislator; and something substantially not very different happens in Spain with the *Comisión Nacional de Reproducción Humana Asistida*³⁷. Almost everywhere, to give another example, the regulation on clinical trials entrusts ethics committees with the task of applying general principles to individual cases, with a large margin of discretion³⁸.

In all of these cases, the law does not begin and end with the act of the Parliament, which is just one part of a larger and more inclusive process. It is anticipated and supplemented by technical bodies, co-regulations, or rules issued by the executive, agencies, or independent authorities, according to a so-called principle of normative complementarity or subsidiarity³⁹. And ultimately, the judiciary has everywhere the task and responsibility of accommodating the *stare decisis* principle to the individual case, carrying out a quasi-creative activity, especially on most cutting-edge issues.

³⁷ S. PENASA, *La legge della scienza: nuovi paradigmi di disciplina dell'attività medico-scientifica*, cit., pp. 244 ss.

³⁸ See, in general, L. BUSATTA, C. CASONATO (eds.), *Axiological Pluralism. Jurisdiction, Law-Making and Pluralism*, Cham, 2021.

³⁹ S. PENASA, *La legge della scienza: nuovi paradigmi di disciplina dell'attività medico-scientifica*, cit., p. 87.

5. Concluding-introductory remarks

As mentioned at the beginning of this brief introduction, the topic of the session “At the Crossroad of Comparative Law: the Relationship of Law with Other Sciences” is complex and dense. Depending on the legal formant and the type of science involved, it presents issues that are as fascinating as they are challenging. In any case, law must respect the shared outcomes of science, as well as the pluralism and dynamism present in contemporary societies (Tuned law). It must also take into account the variability and changeability of the results reached by other sciences, using normative instruments that favour both flexibility and certainty (Timely law). Additionally, it must appreciate the concrete peculiarities of the scientific objects to be regulated, without abdicating the equal treatment principle. As suggested in this short introductory paper, comparative law can play an important role by offering several examples of how to proceed in this direction.