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DELFT UNIVERSITY OF TECHNOLOGY

THE HAGUE – PEACE PALACE

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PARADOXES & LESSONS FOR THE INTERFACE OF LAW AND TECHNOLOGY

The Hon. Michael Kirby AC CMG

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ABSTRACT

The author draws on his experience as a long-serving judge in Australia and as a participant in many international bodies concerned with technological choices and the law. These bodies have included the OECD Expert Groups on Privacy and Information Security, the WHO Global Commission on AIDS and the UNESCO International Bioethics Committee.

How do we ensure that policy choices and legal developments keep pace with fast-moving technological change? In a world of diverse moral viewpoints, religions and cultures, but global technology, how can governments and legislators be aided in the expression, selection and

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implementation of ethical and legal choices? In Australia, this was an issue addressed in 2005 by the Lockhart Committee Report on the use of embryonic stem cells. Using that report, and later political and social debates, the author describes the institutional log-jam that has occurred in many countries in tackling the regulation of tomorrow's technologies. How we address and break the log-jam with its paradoxes and lessons for law-makers is important for the facilitation of beneficial technologies in society. But it is also vital for the health of democratic institutions and the survival of the rule of law and democratic participation in, and accountability for, the difficult choices that need to be made in expressing the law.

LAW AND TECHNOLOGY

Regulating Human Tissue Transplantation Case: Dean Acheson, one-time Secretary of State of the United States of America, called his memoirs *Present at the Creation*[1]. It was a clever title, laying claim to having been at the important meetings during and after the Second World War in which the new world legal order was established.

The claim was faintly preposterous, given that the Second World War grew out of the First, and bore remarkable parallels to other conflicts dating back to the Peloponnesian Wars of ancient times. Undeterred, I make an equally preposterous claim that I was present at the creation of the modern problem that occasions this lecture at

[1] D Acheson, *Present at the Creation: My Years at the State Department* (W.W. Norton, Inc.) 1969.

the Peace Palace on the challenge presented to legal regulation by the advent of modern technology. The claim is absurd because technologies have advanced for millennia by the genius of technologists and scientists, who stood on the shoulders of their predecessors, also dating back to ancient times[2].

Yet acknowledging the ancient lineage of contemporary technologies, they present a particular difficulty today that, no sooner is a law made to address some of their features, and to regulate those deemed necessary for regulation by reference to community standards, but the technology itself has raced ahead. The law in the books is then in great danger of being irrelevant, in whole or part. Texts written down at one time may have little, or no, relevance to events that happen thereafter.

In 1975, soon after I was first appointed a judge in Australia, I was seconded to chair the Australian Law Reform Commission (ALRC). Our task was to advise the Australian Parliament on the reform, modernisation and simplification of Australian federal law. I was soon to be joined by a brilliant professor from Adelaide, James Crawford – who now graces a seat in the International Criminal Court honoured in the Peace Palace in The Hague.

One of the first inquiries assigned to the ALRC concerned an issue of biotechnology. The Attorney-General required us to prepare a

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[2] Sir Isaac Newton in a letter to Robert Hooke, 5 February 1675/6 wrote: "If I have seen further it is by standing on the shoulders of giants".

draft law for the Australian Capital Territory (a federal responsibility) to deal with the issues presented to the law by the new technology of human tissue transplantation.

The Commission fulfilled its mandate. It produced its report on time.[3] Within Australia, the report proved highly successful. Not only did it result in the adoption of a law on this aspect of biotechnology for the Capital Territory;[4] the draft legislation attached to the ALRC's report was soon copied in all parts of Australia[5]. Such was the universality of the issues that we addressed that the report was also quickly translated into languages other than English and used overseas in the development of the laws of other countries.

The report described the then rapid developments that had recently occurred because of advances in transplantation surgery. One of the events that had propelled the Australian Attorney-General into action on this subject was the world-wide controversy that had surrounded the first transplantation of a human heart in South Africa in December 1967 by Dr Christiaan Barnard. The ALRC was quite pleased with itself for delivering its report on time. After all, there were many difficult and controversial legal topics of legal regulation to be addressed.

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[3] Australian Law Reform Commission , *Human Tissue Transplants* (Report No 7, 1977).
[4] *Transplantation and Anatomy Act* 1978 (ACT).
[5] *Human Tissue Transplant Act* 1979 (NT); *Transplantation and Anatomy Act* 1979 (Qld); *Human Tissue Act* 1982 (Vic); *Human Tissue and Transplant Act* 1982 (WA); *Human Tissue Act* 1983 (NSW); *Transplantation and Anatomy Act* 1983 (SA); *Human Tissue Act* 1985 (Tas).

However, as the ALRC was producing its report, it became aware of a major medical development namely the process of *in vitro* fertilisation and embryo transplantation in human patient. This therefore had to be mentioned in the report. However, the ALRC recognised that the fertilisation of the ovum of a woman *in vitro* raised issues different in kind from those presented by the transplantation of particular organs and tissues.

Similarly, the ALRC had become aware, even at that time, of the potential of transplantation of foetal tissue. It noted that work on foetal tissue transplants "may have already begun in Australia"[6]. The ALRC inquiry on human tissue transplantation afforded a vivid illustration of how, in the regulation of technology, events rarely, if ever, stand still. Even between the time that the ALRC initiated its project on human tissue transplantation law and the time it reported, the technology had moved on.

Regulating information technology: Soon after the completion of the law reform project on human tissue transplants, the ALRC was asked to prepare recommendations on reform of the Australian law governing the protection of privacy. This too led to a major inquiry. As befitted the delivery of our report close to 1984 at a major focus because the new technology of automated informatics. Even at that time, such technology had significantly changed the way in which information was being collected and distributed and the amount of

[6] ALRC 7, *ibid* 20 [45]-[46].

personal information that could be stored and communicated. Because of the currency of the Australian inquiry, I was sent as the Australian representative to a group of experts convened by the Organisation for Economic Cooperation and Development (OECD) in Paris. That expert group was formed to make recommendations to member countries of the OECD on guidelines for the protection of privacy in the context of transborder data flows.

In the event, I was elected to chair the OECD expert group. Between 1978 and 1980, it conducted its inquiry, drawing upon principles already developed in relation to automated and non-automated data systems by the Nordic Council, the Council of Europe and the then European Economic Community. In the result, guidelines were completed and agreed to by the council of the OECD[7]. They were to prove highly influential with legal systems as diverse as Australia, Canada, Japan and the Netherlands and corporate practice in the United States of America. The Australian *Privacy Act,* based on the ALRC report, was enacted by the Australian Parliament in 1988[8].

Annexed to the Australian *Privacy Act*, in Schedule 3, were "national privacy principles". As the Act declared in its Preamble, its purpose included compliance by Australia, as a member of the OECD, with the recommendation made by Council "that member countries take

[7] Organisation for Economic Cooperation and Development, *Guidelines on the Protection of Privacy and Transborder Data Flows*, Paris, 1980.
[8] *Privacy Act* 1988 (Cth).

into account in their domestic legislation the principles concerning the protection of privacy and individual liberties set forth in Guidelines annexed to the recommendations".

However, a difficulty soon became apparent. It did not arise out of any defect in the understanding of the OECD expert group, or of the ALRC, in its recommendations, concerning the technology then deployed. However, that technology had quickly changed in its potential. Moreover, it did so in a way that rendered an assumption, expressed in the OECD Guidelines and in the Australian national privacy principles, out of date (at best) and irrelevant (at worst).

Illustrating the issue by reference to the "Use and Disclosure Principle", the second in the Australian national privacy principles, this principle stated:

> "2.1 An organisation must not use or disclose personal information about an individual for a purpose (the secondary purpose) other than the primary purpose of collection unless:
>
> (a) Both of the following apply:
>
> (i) The secondary purpose is related to the primary purpose of collection and, if the personal information is sensitive information, directly related to the primary purpose of collection;

(ii) The individual would reasonably expect the organisation to use or disclose the information for the secondary purpose; or

(b) The individual has consented to the use or disclosure; or

(c) If the information is not sensitive information and the use of the information is for the secondary purpose of direct marketing [certain provisions follow]; or

(e) The organisation reasonably believes that the use or disclosure is necessary to lessen or prevent:

(i) A serious or imminent threat to an individual's life, health or safety; or

(ii) A serious threat to public health or public safety; or

(f) The organisation has reason to suspect that unlawful activity has been, is being or may be engaged in …; or

(g) The use or disclosure is required or authorised by or under law.

The basic hypothesis of the OECD Guidelines (and therefore of the ALRC recommendations) was that personal information that was collected should ordinarily be restricted to use for the purpose for which it was originally collected and that such purpose should be made known to the individual at the time of the collection[9]. Then along came search engines, including *Google*. The specification of

[9] *Privacy Act* 1988 (Cth), Schedule 3. "Privacy Principle 1 (Collection)".

the purposes of collection and the limitation of use and disclosure by reference to such purposes went out the window[10].

This is the sense in which I assert that I was present at the creation of the problem addressed in this lecture. Accepting as paradigm instances the cases of biotechnology and information technology that I have described, a difficulty (in some cases near impossibility) was soon apparent, namely drafting any law of the conventional kind that would not quickly be overtaken by events.

PARADOXES IN DRAFTING LAWS ON TECHNOLOGY

Doing the best without experts: Having laid the ground, I hope, for my competence to provide this lecture, I will now proceed to identify a number of paradoxes, or at least curiosities, that emerge in considering this problem. The first of these, certainly a curiosity, is a reflection not only on my own limited competence to participate in the task under contemplation but also on the limited competence of everyone else.

There are no real experts, as such, on the specific subject of regulating technologies. They do not exist in the United Kingdom, the United States, Australia, The Netherlands or anywhere else. It is much easier to find an expert on the intellectual property

[10] Another somewhat similar illustration arose out of the enactment of provisions requiring that confessions and admissions to police, by suspects in custody, should be recorded on "videotape". See eg *Criminal Code* (WA), s 570D(2)(a). The change to digital technology necessitated amendment of such laws to substitute a requirement for "audio-visual recording". See *Criminal Investigation Act* 2006 (WA), s 118(1).

implications of biotechnology and information technology than it is to find someone skilled in considering what new law, if any, should be adopted to deal with a particular issue presented by technology and how it should be devised and expressed.

Professor Lawrence Lessig, Professor of Law at Stanford Law School in the United States was the founder of that School's Center for Internet and Society. His book *Code and Other Laws of Cyberspace* (now updated by *Code V2*) blazed an important trail. He is something of a guru on the interface of cyberspace and the law. His original thesis is that 'Code', or the architecture of technological systems, will sometimes incorporate regulatory imperatives into the information technology itself, thereby obviating any real choice on the part of the user as to whether or not to conform to the law.

In 2005, the High Court of Australia on which I then served, came face to face with this reality in a case called *Stevens v Sony Computer Entertainment*[11]. The case concerned a claim by Sony Corporation of breach of a "technological protection measure" installed by it in the programme of its computer games. Sony asserted that the measure was protected under the Australian *Copyright Act* 1968. Sony argued that Mr Stevens had unlawfully sought to circumvent the device incorporated in computer games

[11] (2005) 79 ALJR 1850; [2005] HCA 58.

that Sony produced and sold on a CD-Rom for use in its PlayStation consoles.

Applying a strict interpretation to the expression "technological protection measure", the High Court of Australia held that Sony's device did not fall within the statute. I agreed in this analysis[12]. The case was a vivid illustration of the way in which, for copyright, contractual and other legal purposes, attempts are now often made to incorporate regulatory provisions in the technological codes. It is a new development, although I suppose one could detect earlier primitive attempts directed at the same object in the safety provisions incorporated in the design of houses, bridges and aeroplanes. Sony's computer PlayStations simply took this development to a higher level of sophistication and technological capability. Professor Lessig identified this new development. Inevitably, his expertise did not include all of the current major technologies, still less the way in which the law could regulate them all.

I am no expert in the design of laws. True, I sat in a final national court that sometimes pronounced new interpretations of the law. I also worked for a decade in national law reform, as I have described. It recommended to Parliament the enactment of new laws. True also, I have participated in the drafting of international

[12] (2005) 79 ALJR 1850 at 1880 [186].

guidelines, such as those of the OECD[13]. However, this is hardly an intensive preparation for the complex and technical task of drafting new national laws on even newer technologies.

V. I. Lenin once declared that the drafter of the minutes of an organisation usually ends up controlling it. His work as General Secretary of the Soviet Communist Party obliges us to take this advice seriously. We may complain about the absence of law concerned with new cutting edge technology. We may acknowledge our own imperfections for addressing the gap. We may recognise, with Professor Lessig, that regulation in the future may not necessarily come in the form of legal instruments made by or under the legislature. Nevertheless, the issue tackled in this lecture is undoubtedly one of greatest importance for the future of the rule of law in every society. Despite the many weaknesses of lawyers in drafting new laws for new inventions, they may, in the long run, have a paradoxically disproportionate impact on perceptions of how technologies may be regulated and used, simply because lawyers are amongst the first to ask this crucial question. Increasingly the content of law, like the content of life, will be concerned with technology and with its many consequences for society. The importance of the chosen topic therefore belies the comparatively little that is written, said and thought about it. Paradoxically, then,

[13] Also as chair of the UNESCO International Bioethics Committee drafting group for the *Universal Declaration on Bioethics and Human Rights*, adopted by the General Conference of UNESCO, Paris, October 2005. See R Andorno, "Global bioethics at UNESCO: in defence of the Universal Declaration on Bioethics and Human Rights" (2007) 33 *Journal of Medical Ethics*, 150.

those who first lay claim to expertise in legal regulation may participate in a self-fulfilling prophesy.

Too much/too little law: The second paradox is that most of us recognise that the failure to provide law to deal with the consequences of particular technologies is not socially neutral. Effectively, to do nothing is often to make a decision.

Thus, for the law to say nothing about reproductive cloning of human beings, for example, would be to give a green light to experiments in that technology. In so far as law expresses prohibitions supported by sanctions that uphold the command of a sovereign power, silence by the regulator may, for once, imply consent or at least non-prohibition. A scientist or technologist may proceed out of sheer curiosity, as when Professor David Baltimore, later Nobel Laureate, so beneficially investigated a simian retrovirus a decade before the discovery of the immuno-deficiency virus in human beings (HIV). It is such curiosity that carries science and technology forward before any prohibitions are enacted. In David Baltimore's case, that was most beneficial.

The recognition that inaction in the face of significant technologies may amount to making a decision co-exists with our appreciation, as observers of the law, that premature over-reaching or excessive lawmaking may, in some cases, be an option worse than doing nothing. It may place a needless impediment upon local scientists

and technologists, obliging them to take their laboratories and experiments offshore.

In a big world with diverse cultures, religions and moral beliefs, it is never difficult to find a place offering a regulation-free zone in exchange for investment dollars. Just as bad is the possibility that laws are solemnly made and then ignored or found to be ineffective, as was temporarily the case with the "technological protection measure" considered in the Australian Sony litigation. Following the decision of the High Court of Australia in that case, and under pressure from the United States Government under the *United States-Australia Free Trade Agreement*, Australian law was changed by Parliament. The new law represented an attempt to overcome the High Court's decision, although in a somewhat different way[14].

Many technologists are legal libertarians. They are so mainly because of their recognition of the common potential of premature, over-reaching and ill-targeted laws to diminish experimentation, burden innovation and cause economic and other inefficiencies. Thus, many scientists have presented compelling arguments about the dangers of adopting the influential "precautionary principle" so

[14] The story of the change of law following the decision in the *Sony* case is told in M de Zwart, "Technological enclosure of copyright: The end of fair dealing?" (2007) 18 *Australian Intellectual Property Journal* 7; contrast D Brennan, "What can it mean 'to prevent or inhibit the infringement of copyright?: - A critique of *Stevens v Sony*'" (2006) 17 *Australian Intellectual Property Journal* 81 at 86. See also *Copyright Amendment Act* 2006 (Cth) implementing the new scheme said to be required by art 17.4.7 of the *Australia-United States Free Trade Agreement*.

far as new technologies are concerned[15]. Whilst this principle appears to be gaining increasing acceptance in the international community, particularly in respect of protection of the global environment, it carries risks of its own. If taken too far, it could instil a negative attitude towards science and technology. It could encourage excessive regulation in the attempt to avoid *any* risks. Life is risky. Most technological innovations carry some risks. An undue emphasis on precaution, for fear of *any* risks, would not be good for science or technology. Sometimes it would not be advantageous for the global economy or for innovation in thought as well as action.

The second paradox is thus more of a contradiction or tension, difficult to resolve. At the one time we must accept that doing nothing to regulate technologies often involves effectively making a decision. Yet we must also recognise that sometimes doing nothing will be a better option than making laws that undeniably impede innovation and burden efficiency.

Influence of US values and law: An instance of overreach, frequently mentioned, is the installation of filters designed to prohibit access to materials considered “harmful to minors”. Many countries now have legal regulations forbidding access to, or possession of, child pornography. Available software may prevent access to sites providing such images. However, sometimes they may do so at a

[15] R Andorno, ‘The precautionary principle: a new legal standard for a technological age’, (2004) *Journal of International Biotechnology Law* 1, pp. 11-19.

cost of over-inclusive prohibitions. The burden on free communication may outstrip the legitimate place of legal regulation, forbidding access not only to child pornography but to lawful erotic materials, artistic works, discussion about censorship itself or access to websites concerned with subjects of legitimate interest, such as aspects of human sexuality, women's rights and even children's rights.

Whereas the law will commonly afford avenues of appeal and review of decisions that purport to apply legal norms, an over-reaching "protective" software programme may afford no such rights of challenge. Those concerned about the human right of free expression are naturally anxious about the potential of what Lessing describes as 'Code' to re-institute excessive censorship in society, just when we thought we had grown out of that habit.

This consequence can present legal and practical problems of regulation of technology in jurisdictions enjoying different capacities to contest the balances struck by the Constitution and laws of the United States. The first Amendment to the United States Constitution gives a very broad protection to free expression. In smaller economies however, there may be no real choice. Upholding the local constitution with its different values may, as a matter of practicalities, be practically impossible. If they buy the software that drives the PlayStation, the purchasers may find that it reflects United States constitutional and copyright laws. Indeed,

such software may exceed even the protections afforded by those laws. It is in this sense that 'Code' and technological architecture may challenge the previous assumption that, within one's own borders, each nation state is entitled, and able, to make and enforce its own laws, reflecting its own values. In Australia, we gained a glimpse of things to come in the *Sony* litigation. But it was only the beginning.

There is an irony here. The country which has been foremost in promoting values of free expression and the free press (the United States of America) has lately been foremost in promoting, extending and enforcing the intellectual property rights of its own creators, 'inventors' and designers.

Technology's democratic deficit: A fourth paradox derives from the way in which contemporary technology at once enhances, and diminishes, our facilities of democratic governance. No one can question the importance of science and technology in the current age. Similarly, no one can question the desirability of rendering laws (and regulation more generally) available and accountable to the people from whom authority to govern society is ultimately derived. However, on balance, does the modern technology of communications enhance or reduce democratic accountability for the state of the resulting regulations? In the current age of Brexit, Donald Trump and Marine Le Pen, those are legitimate questions.

In some respects, there can be no doubting that technology has improved communication that is essential to converting the formalities of electoral democracy into a more genuine accountability of the governors to the governed. Radio, television, world-wide satellite communications, the Internet, podcasts, blogs and so forth have revolutionised the distribution of information about the conduct of those persons and institutions whose decisions affect the regulation of our daily lives. In this sense, democratic governance has moved from small town hall assemblies (of earlier times) into huge national and international forums both public and private (of today).

Paradoxically, however, the very quantity of information has resulted in its manipulation and presentation that is often antithetical to real democratic accountability. The technology stimulates a demand for the simplification and visualisation of messages, the personalisation of issues, the trivialisation of conflict, the confusion between fact and opinion and the centralisation and "management" of news. So-called 'spin' and 'infotainment' are characteristics of the present age. They tend to concentrate power in a way that even George Orwell in 1948 could not have imagined.

For example who can, or would, challenge the over-inclusive software designed to bar access to Internet sites selected as "harmful to minors" but which sometimes operate in an over-inclusive way?

Shortly before I departed the High Court of Australia, I found that the website of the Archbishop of Canterbury was barred to use. My staff were unable to procure one of the Archbishop's addresses. This was presumably because a filter, instituted in the Court to deny access to websites deemed undesirable, had imposed a bar to my enquiries. Presumably, this was because, in the manner of these times, one or more of his Grace's addresses dealt with issues of sex, specifically homosexuality. In fact, that was exactly why I wanted the speech. (I was surprised to find that at the same time the Vatican website was accessible without any restriction. This may say something either about the prudence of the then Pope's choice of language, the power of the Roman Catholic Church in such matters or the religion of the filter programmer.) I gave directions that led to the filter being over-ridden. I secured copy of the desired speech. But many might not be so fortunate.

Given the importance of technology to the current age, how do we render those who design, install and enforce such programmes accountable to the ever changing democratic values of our society? As 'Code' enlarges and replaces the old style legal regulation of technology, how do we render its architects answerable to the majority views of the people? How, if at all, are transnational corporations, like Sony (for instance) rendered responsible to the democratic values of the nations in which their products are sold and used?

These are legitimate questions because the fourth paradox is the coincidence, at the one time of history, of technologies that vastly enhance access to information that jumped the Berlin Wall (or to some extent now to the DMZ in Korea) bringing messages of freedom, at the same time as they sometimes diminish genuine debate, unleash a tide of trivia enlarge unreviewable 'technological' corporate decisions and expand the capacity to 'manage' news and spread false facts in a way inimical to real transparency and accountability of decision-makers to the people.

Vital but neglected topics: I reach my fifth, and final, paradox. Because of the elusiveness of much contemporary technology to effective regulation large and increasing areas of activity in society find themselves beyond the traditional reach of law as we have hitherto known it. When regulation is attempted, as I have shown, it will often be quickly rendered ineffective because the target of the law has already shifted.

Typically, in the past, the drawing up laws has been a slow and painstaking process. Consulting governments and those primarily affected, not to say the people more generally, takes much time. In that time, the technology may itself change, as I have demonstrated from my experience with human tissue transplantation and privacy laws. Now new forms of regulation are being developed in the form that Professor Lessig calls 'Code'. Yet this form of regulation is not

so readily susceptible (if susceptible at all) as conventionally laws have been, to democratic values and to the participation (or even appreciation) by most of those affected of the moral choices that determine the point at which the regulation is pitched.

LESSONS ON THE LAW FOR TECHNOLOGY

Recognise a basic dilemma: Certain general lessons stand out from the interface of law and technology.

The first is that, the regulation of technology faces a fundamental dilemma hitherto uncommon in the law. This is that, of its character, technology is normally global. Law, being the command of an organised community is normally tied to a particular geographical jurisdiction. Whereas in recent years the need for extra-territorial operation of municipal i.e. national law has been recognised, and upheld[16], the fact remains that the focus of most national law is the territory of the nation. By way of contrast, the focus of regulating technology must be the technology itself[17]. Sometimes, that feature of the technology will make effective regulation by national law difficult, or even impossible.

It is into this context that direct enforcement by 'Code', written into software programmes or otherwise imposed, adds a new dimension

[16] *Re Aird; Ex parte Alpert* (2004) 220 CLR 308 at 344-350 [114]-[133] referring to the case of the *SS "Lotus*" (1927) Permanent Court of International Justice, Series A, No 10, Judgment No 9, pp 18-19 and J Martinez, "Towards an International Judicial System", 56 *Stanford Law Review* 429 (2003).
[17] *Dow Jones* (2002) 210 CLR 575 at 615-619 [78]-[92].

to global technology. The values and objectives of transnational corporations may be even more unresponsive to national regulation than the rules of municipal legal system are. Moreover, 'Code' of this kind may opt for caution and over-inclusion so as to avoid dangers to markets in the least right-respecting countries. The contractual arrangements entered between the government of the People's Republic of China and the corporations selling access to *Google* in China, illustrate the willingness of the ardent technologists sometimes to succumb to the demands of the large-market stakes so as to avoid endangering a lucrative economic market for their products. In this way the provider (but also the users) may be subjected to forms of censorship that might not be tolerated in other societies. A smaller country, with a smaller market, is unlikely to exert the same clout. Considerations of economics rather than of legal principle, ethical rules or democratic values may come to predominate in such cases.

Recognise that inaction is a decision: In the past, proponents of technological innovation have often favoured restrictions upon the law and a 'libertarian' approach to developments of technology.

Likewise with biotechnology. Thus, views may differ over whether regulation is necessary, or even desirable, to prohibit therapeutic cloning, reproductive cloning or the use of human embryonic stem cells. Yet non-binding prohibitory resolutions and declarations have been adopted in the organs of the United Nations on at least one of

these subjects[18]. Even those nations, like the United Kingdom, that have not generally favoured prohibitions or moratoriums on experiments with human cloning for therapeutic purposes might well accept the need to prohibit, or restrict, some bio-technological experiments. Hybridisation and xeno-transplantation of tissue across animal species may require, at the very least, restrictions and safeguards so as to prevent cross-species transmission of endogenous viruses.

This is why the regulation of technology is such an important topic. It is not one that can be ignored, simply because the subject matter, and the available regulatory techniques, are difficult and sometimes controversial.

Recognise the limited power to regulate: A third lesson, derived from the first two, is that the normal organs of legal regulation often appear powerless in the face of new technology. This is clear in the case of attempts to regulate new information technology. So far as the Internet is concerned, the regulatory values of the United States of America inevitably exert the greatest influence on the way the Internet operates and what it may include. This means that both First Amendment and copyright protection values, established by the law of the United States, profoundly influence the Internet's present design and operation. An attempt by another nation's laws (such as

[18] K L Macintosh, "Human Clones and International Human Rights" (2005) 7 *University of Technology, Sydney Review* 134 at 135-136 describing the resolution of the General Assembly of the United Nations of 8 March 2005. This approved a Declaration, proposed by the Sixth Committee, to "prohibit all forms of human cloning inasmuch as they are incompatible with human dignity and the protection of human life". The General Assembly vote was 84 to 34 in favour with 37 abstentions.

those of France) to prohibit transnational publication offensive to that country's values (such as advertising Nazi memorabilia) may face difficulties of acceptance and enforcement in the Internet[19]. This is the counterpart to the opposite problem: Where in the name of US security access to mega data is permitted or required for US governmental agencies, there may be little that can be done by smaller players.

The same is true of biotechnology. The Australian Parliament in 2002 enacted two laws: the *Prohibition of Human Cloning Act* 2002 (Cth) and the *Research Involving Human Embryos Act* 2002 (Cth). These were part of a package of laws aimed at the consistent prohibition in Australia of human cloning and other practices deemed unacceptable at the time. Both Acts were adopted on the basis of the promise of an independent review two years after the enactment. Such a review was duly established. It was chaired by a retired federal judge, the Hon John Lockhart. The review presented its report on December 2005. It recommended an end to the strict prohibitions of the 2002 legislation; the redefinition for legal purposes of the "human embryo"; and the introduction of a system of licensing for the creation of embryos for use for therapeutic purposes[20].

[19] *League Against Racism and Anti-Semitism (LICRA), French Union of Jewish Students, v Yahoo! Inc. (USA), Yahoo France* [2--1] *Electronic Business Law Reports*, 1(3) 110-120 (The County Court of Paris).
[20] Australian Government Legislation Review: *Prohibition of Human Cloning Act* 2002 and the *Research Involving Human Embryos Act* 2002, *Report*, Canberra, December 2005.

Initially, the Australian government rejected the recommendations of the Lockhart review. However, following political, scientific and media reaction, a conscience vote on an amending Act, introduced by a previous Health Minister, was allowed. In the outcome, the amendments were enacted. They passed the Senate with only a tiny majority[21].

The main arguments that promoted this outcome in Australia were the recognition of the pluralistic nature of the society; widespread reports on the potential utility of the research and experimentation; and the expressed conviction that experimentation would proceed in overseas countries with results that, if they proved successful, would necessarily be adopted and utilised in Australia[22]. Interestingly, both the then Prime Minister (Mr Howard) and the then Leader of the Federal Opposition (Mr Rudd), later Prime Minister, voted against the amending Act in mid-2006[23].

Recognise differentiating technologies: So far as regulation of technologies is concerned, there is a need to differentiate technologies for the purpose of regulation. It is not a case of one response fits all. Self-evidently, some forms of technology are

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[21] In the Australian House of Representatives, the vote was 82:62. See *Commonwealth Parliamentary Debates (House of Representatives)*, 6 December 2006, 127. In the Senate the vote was 34:31. See *Commonwealth Parliamentary Debates (Senate)*, 7 November 2006, 48.

[22] See eg "Let the debate begin: Australia should lead, not lag, in regenerative medicine", *The Australian*, 7 August 2006, p 15 and B Finkel and L Cannold, "Day for Stem Cells and the Hope of Finding Cures", *Sydney Morning Herald*, 7 August 2006, p 9; L Skene and Ors, "A Greater Moralilty at Stake on the Decision of Stem-Cells Research", *Sydney Morning Herald*, 14 August 2006, 11; B Carr, "Age-Old Objections Must not be Allowed to Delay this Revolution", *Sydney Morning Herald*, 25 July 2006, 13.

[23] Mr Howard spoke at *Commonwealth Parliamentary Debates (House of Representatives)*, 6 December 2006, 117. Mr Rudd spoke, *ibid*, p 119.

highly sensitive and urgently in need of regulation. Unless the proliferation of nuclear weapons is effectively regulated by the international community, the massive destructive power that they present has the potential to render all other topics theoretical. Similarly, some aspects of the regulation of biotechnology are sensitive, including the use of embryonic stem cells and germline modification.

Somewhat less sensitive is the regulation of information technology. Yet this technology also presents questions about values concerning which people may have strong differences of opinion. To outsiders, Americans seem to imbibe First Amendment values with their mother's milk. United States lawyers sometimes have to be reminded that their balance between free speech and other human rights and values is viewed in most of the world as extreme and disproportionate.

Recognise different cultures: Most of the discussion about regulating technology takes place in the developed world. They therefore generally reflect attitudes of optimism and confidence about the outcome of rational dialogue and the capacity of human beings ultimately to arrive at reasonable and proportionate responses to regulating technologies, on the basis of calm debate.

The current age bears witness to many instances of religious fundamentalism. Secular democracies can usually prepare their

regulations of technology without undue attention to such unyielding considerations. But when the considerations come before international law-makers, they may have to run the gauntlet of fundamental beliefs. Such religious beliefs are by no means confined to Islam. They also exist in Christianity, Judaism, Hinduism and other world religions and value systems. Because, in such instances, religious instruction may be attributed to God and derived from human understandings of an inerrant religious texts, it may brook no debate and no compromise.

Basing regulation on good science: In the early days of the HIV pandemic, I served on the Global Commission on AIDS of the World Health Organisation. One of the members, June Osborn, then a professor of public health in the University of Michigan, taught the importance of basing all regulatory responses to the HIV epidemic upon sound science. The fundamental danger of responses based on assumptions, religious dogmas, intuitive beliefs, or popular opinion was that they would not address the target of regulation effectively.

The intervening decades have suggested that the countries that have been most successful in responding to HIV/AIDS have been those that have observed June Osborn's dictum[24]. The same is

[24] D Plummer and L Irwin, "Grassroots activities, national initiatives and HIV prevention: Clues to explain Australia's dramatic early success in controlling the HIV epidemic", (2006) 17 *International Journal of STD and AIDS*, 1.

true, I suggest, of the subjects of biotechnology, information technology and neuroscience. For example, the long-held judicial assumption that jurors, and judges themselves, may safely rest conclusions concerning the truth of witness testimony on the basis of the appearance of witnesses and courtroom demeanour has gradually evaporated because scientific experiments shatter this illusion[25]. Other modes of reasoning were required. Any regulation must recognise the need to remain abreast of scientific knowledge and technological advances.

Addressing the democratic deficit: This brings me to the last, and most pervasive, of the lessons. Technology races ahead. Often its innovations quickly become out of date. Laws addressed to a particular technology are overtaken and rendered irrelevant or even obstructive. Nowadays scientific knowledge, technological inventions and community values commonly change radically in a very short space of time.

Within less than two years, demands were made for reversal to the Australian federal prohibition on therapeutic cloning. Within five years, the prohibition was repealed. In such an environment, there is an obvious danger for the rule of law. It is impossible to expect of legislatures, with their many responsibilities and political obsessions, that they will address all of the technological developments for regulatory purposes. The average legislator finds such issues

[25] See eg *Fox v Percy* (2003) 214 CLR 118 at 129 [31]; ([2003] HCA 22).

complex and impenetrable. They are rarely political vote-winners. They struggle to find a place in the entertainment and personality politics of the present age as well as with the many other competing questions awaiting political decision-making. This leaves a gap in democratic involvement in this sphere of regulation. It is a gap that is being filled, in part, by 'Code' which incorporates regulations designed by inventors of information systems themselves in the structure of such systems but without a democratic input or the necessity of individual moral judgment.

The democratic deficit presented by contemporary technology is thus the largest potential lesson for this area of lawmaking. In an age when technology is so important to society, yet so complex and fast moving that it often defies lay understanding, how do we adapt our accountable law-making institutions to keep pace with such changes? One means, observed in Australia, is by the use of consultative mechanisms such as the ALRC[26] or independent inquiries, such as the Lockhart committee[27]. In such cases, the very process of consultation and public debate can help to promote at least a broad community understanding of the issues, an appreciation of different viewpoints and an acceptance of any

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[26] D Chalmers, "Science, Medicine and Health in the Work of the Australian Law Reform Commission" in D Weisbrot and B Opeskin, *The Promise of Law Reform* (Federation Press, 2005), 374. Important recent reports of the ALRC in the field have included *Essentially Yours: The Regulation of Human Genetic Information in Australia* (ALRC 96, 2003).

[27] D Cooper, "The Lockhart Review: Where Now for Australia?" (2006) 14 *Journal of Law and Medicine* 27; N Stobbs, "Lockhart Review into Human Cloning and Research Involving Human Embryo - Closing the Gap" (2006) 26 *Queensland Lawyer* 247; I Karpin, "The Uncanny Embryos: Legal Limits to Human Reproduction without Women" (2006) 28 *Sydney Law Review* 599.

regulations adopted, even when they may give effect to conclusions different from one's own.

Adapting the legislative timetable and machinery to the challenges of modern governance is a subject that has engaged law reform bodies and executive government for decades. In Australia, proposals for some form of delegated legislation have been made to increase the speed of the implementation of such reports. Often they lie ignored for years, or indefinitely, not because of any real objections to their proposals but because of the legislative logjam[28]. In the United Kingdom, suggestions for a fast track system for implementing technical or uncontroversial reports of the Law Commissions have been under review for some time[29]. In Australia, recent years have seen a decline in support for institutional law reform. Such funding as is available tends to get gobbled up on policing and security concerns. This now is the focus of political attention. Updating to keep pace with technological change is just too complex and insufficiently politically attractive.

In the face of fast changing technologies and the danger of a growing democratic deficit, it will obviously be necessary to adapt and supplement the lawmaking processes we have hitherto followed in most countries. Various forms of delegated legislation may need to be considered. So may the enactment of over-arching laws,

[28] A F Mason, "Law Reform in Australia" (1971) 4 *Federal Law Review* 197.
[29] See M D Kirby, "Law reform and human rights - Scarman's great legacy" (2006) 26 *Legal Studies* 26, 449–474 at 466.

expressed in general terms, which will not be quickly reduced to irrelevancy by further technological change[30]. Addressing the weaknesses in democratic accountability of large and complex modern government is an important challenge to legal and political theory[31]. I hope that this lecture has demonstrated once again the ingredients and urgency of the problem. It will take more such lectures – and more political responsiveness - to produce the solutions appropriate to the differing systems of government operating in different countries. So how are we doing?

I know that the Delft University of Technology is greatly regarded for its work in the areas of engineering, information technology and nanotechnology. At a conference in London a while back Dr Bert Gordijn presented an introduction to nanotechnology for mere lawyers[32]. The advance of ever-increasing data, crammed into ever-smaller physical objects, seems (so far) to have reached no final limits. The entire library of the United States Congress can, it appears, now be reduced to a tiny microchip. Scientists are even experimenting to discover whether it will be possible to implant all this knowledge in a human brain, rendering it directly available to the recipient on demand. Dr Gordijn made the point that the cutting edge of much of nano-technology exists in military circles for military use, doubtless for the hoped for advantages for the modern "war

[30] Issues considered in *R v Quintaralle (on behalf of Reproductive Ethics) v Human Fertilisation and Embryology Authority* [2005] UKHL 28 at [25]; cf R Brownsword, 'Interpretive Re-connection, the Reproductive Revolution and the Rule of law', unpublished, p 20f.
[31] *Ibid*.
[32] cf G H Reynolds, "Nanotechnology and Regulatory Policy: Three Futures" 17 *Harvard Journal of Law and Technology* 179 (2003).

fighters" who are increasingly replacing old fashioned soldiers and armed service personnel.

Possibly the most troubling image of the conference, at least for the lawyers, was an illustration of a humanoid kind of electronic human head, otherwise disengaged from human form, into which (it was postulated) the 'mind' of a living individual might in the future be uploaded so that that individual's knowledge and intellect, in software form, could potentially live forever. The crossover of biological materials into electronic is a development that has already begun. A contemporary issue of *The Economist* described how this marriage of biotechnology and economics is hoping to produce economic modelling which is closer to the messy biological reality of the real world than the economic modelling used to date[33]. At least potentially, developments of this kind may produce the next great leap in human evolution so that derivatives of the human species may one day set out for the hostile environments of distant planets and far off galaxies in order to survive the eventual destruction of our own, if we can only delay that event long enough from our own efforts.

If all this sounds like science fiction, the lesson of the conference addressed to the central subject of this lecture was that many advances of contemporary science and technology grew out of the imagination of science fiction writers, writing not so long ago.

[33] "Evolving Ideas", a review of *Adaptive Markets: Finance Evolution at the Speed of Thought* by Andrew Lo, *The Economist*, April 8, 2017 (v 423 no 9035) 70.

Professor Bert-Jaap Koops addressed fundamental questions about the survival of democratic and accountable government in the current age of pervasive technology. Like Professor Lessig, he posed the question: If 'Code' is built into technology and individuals are thereby excused from the civic choice to conform, or to contest the regulations, will we lose our sense of good and bad conduct and of our civic responsibilities to infuse our actions with moral values debated in society with fellow citizens?

Professor Mireille Hildebrandt painted the picture of future information technology. She described how, before long, computer software would detect that the user is getting tired and wants a break, causing equipment in the kitchen automatically to prepare fresh pot of coffee. This is all very well. But what of the human entitlement to make such choices for ourselves? More importantly, what of the human need to think and to interrupt other functions for social intercourse and human interaction? The vision of the future of ambient law at last provoked the conference host, Professor Roger Brownsword of King’s College School of Law, into an exclamation demanding that the world be stopped so that those, anxious about where we are going, might get off and regroup.

The more one becomes aware of new technology, the more most contemporary lawyers will be propelled to demand effective democratic debate about its availability and controls over its deployment. Yet in a dangerous world, whose dangers are

emphasised in every news bulletin and relayed in social media, *security* is a top demand. Other demands tend to melt into the rays of its overpowering sun. Personal information, in mega data collections, is increasingly available to government and its regulators posing the reasonable question already raised in the OECD expert group in 1980: is privacy as a value important to human beings already dead?

INTERNATIONAL RESPONSES

At last the international community has responded to this problem. In 2016, the United Nations Human Rights Council appointed a new Special Rapporteur, Joe Cannataci (a professor of law from Malta) on the human right to privacy. He recently delivered his first report to the Human Rights Council. He declared:

> "It's time to reclaim cyberspace from the menace of over surveillance with governments worldwide demanding data from global firms, Google, Microsoft, Facebook, Apple and Twitter. It does not make sense just to rely on the protection of US legal safeguards."

For a big world with potentially different values, the US law (not to say its Constitution and economic interests) are not necessarily harmonious with the values of other contributors to global values. So much was made very clear by the disclosure of widespread

government surveillance by Edward Snowdon – a former US security contractor who once worked at the US diplomatic mission in Geneva. The US did not react to Professor Cannataci's report. However, many countries welcomed it, especially after WIKILEAKS – avowedly an anti-secrecy campaigner – published what it said were thousands of pages of internal US CIA discussion of hacking techniques of smartphones and other technology. China and Russia welcomed the report. The Special Representative's criticism of disproportionate reliance on the suggested needs of anti-terrorism were similar to those of US judges who more recently rejected President Trump's justification of restricting the entry of thousands of similar approved persons from countries where only common element was their Islamic character.

Future lectures in this series (and commentary by Professor John Tasioulas) will need to broaden the scope of the technologies mentioned, so that they include participants with expertise in nuclear technology, the specific technologies of engineering nanoscience, the technologies of energy and global warming and of explorations of the biosphere and outer space. They will need to widen the participation so as to include those who can describe developments in other parts of the world, beyond the western democracies. Poorer countries will be essential participants so as to reflect the diversity of humanity and the likelihood of unexpected reactions to technology.

There will also be a need to deepen the examination of law so as to include case studies of effective as well as ineffective attempts to regulate technology by national law in addition to those attempts that are now emerging from international agencies (designed to address global technology on a transborder basis). Finally, it will be necessary to extend the fields of expertise of the participants. The involvement of political philosophers, of fearful persons who advocate more vigorous regulation, of civil society organisations, law reformers, politicians and legislative drafters. Such participants would enlarge the pool of expertise in essential fields. Even economists should be welcome.

In Australia the Productivity Commission recently published draft recommendations for a comprehensive new right for individuals and businesses to control their own data – “arguably the biggest report to come out of Canberra this decade”. This recommendation, driven by the simple observation that, if data is the key resource of the data revolution, it makes no sense to lock it away in business, community and governmental silos. Indeed, if data is the new determinant of value, then as an asset, citizens should have the right to control the data that exists about them. Which brings me back to the central idea of the OECD Guidelines expressed on the language of the technology of 1980.

Regulating technologies is not a matter suitable for a purely verbal analysis of the traditional legal kind. We cannot find the way ahead

by reading the judicial reasons of our predecessors, however learned they may have been in their own ages. In default of more effective solutions, the common law system offers judges to fill the gaps left by parliamentary and governmental lawmakers[34]. Sometimes this is necessary and possible. But a more coherent solution is desirable. I hope that my lecture, in this famous city and in this palace of peace, law and idealism will contribute to the ongoing dialogue to find a solution. But it is not easy. The future is not clear. But it is certainly urgent.

[34] Illustrations include judicial decisions in cases of "wrongful birth" and "wrongful life". See eg *Cattanach v Melchoir* (2003) 215 CLR 1; ([2003] HCA 38) and *Harriton v Stevens* (2006) 80 ALJR 791; [(2006)] HCA 15); cf *McKay v Essex Area Health Authority* [1983] QB 1166; *Gleitman v Gosgrove* 227 Atl Rep (2d) 689 (1967) and *Curlender v Bio-Science Laboratories* 165 Cal Rptr 477 (1960).