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## Science v Law: The Next Century

The Hon. Justice M.D. Kirby, CMG

[Address given to the Faculty of Science Centenary Celebrations at the Great Hall, The Sydney University, 15 May, 1985. The Hon. Justice M.D. Kirby, CMG was, at the time, the President of the Court of Appeal, Supreme Court, Sydney; Chancellor, Macquarie University, Sydney; and formerly Chairman of the Australian Law Reform Commission. The views stated are personal.]

## 100 YEARS ON

It is extraordinary to think that the proposal to establish a Science Faculty within this University attracted vehement opposition, at the time, by the Principal, the Reverend Charles Badham (Footnote (1)) The first lecture in the University had been given by Professor John Smith in 1852. He chose the subject of chemistry and was no doubt condemned as a “trendy” for his pains. Yet the establishment of a Faculty, to provide coherence to the study of science, engendered passionate opposition. It signalled the move of this University from classical studies to the modern era. It is not a coincidence that the admission of women and the establishment within a year of the Faculties of Medicine and Science occurred with harmonious contemporaneity. The Challis Bequest and the social ferment of the 1870s and 1880s provided a ripe field for change and reform.(2) It is not without irony that the Physics Department was housed for a time in the present Badham building. The Reverend Charles, clinging to the old ways and the old beliefs, is doubtless glowering down upon us, even now as we meet to celebrate and to remember his error.

The century between those vigorous debates and this celebratory week has been marked by human disaster and triumph. The empires which were reaching their apogee a hundred years ago have faded away. The British fleet which swept the oceans and protected far flung colonies, such as Australia, has sailed home. On the international stage, blood and destruction have been the watch words of the century. And to them science has contributed notably and imaginatively. As Robyn Williams insistently reminds us, as often he can, half of the scientists that ever existed are alive today; and half of them are working in connection with military science.

But triumphs there have been, as well. Nuclear fission, though pregnant with possibilities of disaster, is by any account an amazing scientific development of potential utility as well. The micro-chip and informatics are in the process of revolutionising our society, its organization, its work and its leisure patterns. Biotechnology presents stunning possibilities, from in vitro fertilisation through genetic engineering to human cloning and manipulation of DNA. In my many hours of “leisure”, since returning to judicial duties, I have found the time to read in the field of science. Just to prove that there is some value in book launching, I have to tell you that

recently, as a reward for a particularly provocative book launch, I was given John Gribbin's startling book "In Search of Schrödinger's Cat" (3). This little book unveiled for my ignorant eyes the pioneering work of Schrödinger and the other physicists of the 1920s who developed the theory of quantum physics. Amongst other things, this theory led on to the atomic bomb, lasers, the micro-chip and the understanding of DNA. The book provides an accessible account of what is probably the most important discovery of the past 100 years of science. It bears out Niels Bohr's stricture:

"Anyone who is not shocked by Quantum Theory has not understood it". (4)

The world of Newton and even Rutherford was a world of laws, of order and of basic rules. "Rules of Nature" if you like, rules of God for the believers. After quantum theory, it is suggested that there is no such thing as certainty – our world being simply the product of many processes. It is little wonder that the world of new science is such an uncomfortable phenomenon for the lawyer. Trained to understand, and believe in, order, rules, authority and certainty, the lawyer finds the modern world of science and its distaff offspring, technology a puzzling and uncomfortable place.

In part this is because of educational streaming. Lawyers tend to be those who, at school, were noted for their skills in English composition and fascination with the history of battles long ago. Scientists tend to be those who liked a mathematical problem or puzzled over algebra, chemistry and physics. The result is an early separation. Even in universities, where the universe of disciplines should come together, it is rare indeed to see a science/law graduate. Last week, amidst 1,000 handshakes at Macquarie University, I was privileged to greet but one law student who had graduated with a science and law degree. There are few of them. Interestingly one of them, a distinguished graduate of this Faculty, is Justice Lionel Murphy of the High Court of Australia. He is one of the few science/law graduates I know and the only such graduate in the judiciary. Perhaps his original approach to legal concepts derives from his impatience with lawyerly beliefs in the certainty of rules, the unambiguity of the meaning of words and the objectivity of the judicial process.

However that may all be, I have tardily laid my ground. The law loves certainty, order and authority. The problem for today's lawyer (unlike his counterpart outside the university in 1885) is that the world today is engined by science and technology. It is a world of rapid change, of shattered rules, of developments incomprehensible even to the highly intelligent and educated. It is a world of few certainties where science fiction and science merrily exchange places.

## **A CHANGING WORLD**

So far I have been a little critical of my own profession. But it is not entirely the fault of lawyers. As Barry Jones pointed out in January of this year:

"The sheer complexity of 20th century science is a major factor inhibiting community understanding and support." (5)

According to Barry Jones, there has been a long standing anti-intellectual tradition in our country and it is still "alive and well today." He quoted the well-known limerick of the 1920s, possibly anti-Semitic and certainly anti-intellectual:

"I don't like the family Stein  
There is Gert, there is Ep and there is Ein.  
Gert's writings are bunk,

Ep's statues are junk,  
And nobody understands Ein."

According to our erudite Science Minister, Gertrude Stein's reputation is safe. So are Jacob Epstein's statues. And Albert Einstein has been elevated to the pantheon of demigods.

"Einstein remains the only 20th century scientist whose name and image are generally recognised by literate people, followed at some distance by Marie Curie. There is Freud, of course, but his status as a scientist would be hotly contested. Who runs third? There might be a scattered recognition of Rutherford, Bohr, Fleming (though hardly at all for Florey who was more important, except for the fortunate holders of Australia's \$50 notes), Watson and Crick. Jeans, Eddington and Halldane were well known until the 1940s but forgotten now. But Planck, Heisenberg, Dirac, Godel, Schrödinger .... Medawar – they retain their awesome reputations amongst the initiated without ever having made any impact on popular consciousness." (6)

The point that Barry Jones makes is that until the Second World War, science was a subject of intense popularisation. At the time of the foundation of this Faculty and right up to the Second World War, the exposition of science and its impact on life was highly visible and could be understood by the intelligent layman, who put his mind to it. Today "this honourable tradition has largely disappeared ... scientists are now ultraspecialised, hermetically sealed off not only from the community, but often to other practitioners in related disciplines." (7)

Nowadays, because of its mystery, the popular image of science is Dr. Strangelove. A weakness of science is its psychological remoteness – an audience no longer relates to it. Whereas at the time of the foundation of this Faculty, popular science "revealed" mysteries, science today, and in the next century, appears esoteric: constantly saying that the structure of the universe is infinitely mysterious – "the more we explore the less confident we can be about our capacity to provide meaning".(8) Technology and science are linked to the frightening worlds of the atomic bomb, the work destroying micro-chip and weird and manipulative biotech. Dangers are seen in it for man's work and life-style, for man's nature, indeed for man's very existence and survival as a species. And that, if I can say so, is at once the opportunity and risk of the law in its relationship to science in the century ahead.

One of the prime objectives of this celebration should be to rekindle concern about the relationship between modern science and the community. Barry Jones in his second Whitlam Lecture in 1984 called for recognition of science as an element in our political (and I should therefore say, legal) culture:

"There is a major communication gap in scientific areas which I can illustrate by referring to two close friends in the ministry. When Michael Duffy talks to colleagues about the triumph of Essendon .... or John Brown extolls the virtues of the Parramatta "Eels", they establish an immediate bond with their listeners: they do not have to establish their frame of reference. I envy them this facility. .... When I want to share some new intellectual excitement, for example, Ilya Prigogine's fundamental questioning of the second law of thermo dynamics .... I run the risk of sounding pretentious, a prig, a bore, or – even worse – an intellectual. Australia must be one of the few countries in the West where "intellectual" and "academic" are still terms of abuse and yet is it unreasonable to

argue that the implications of Prigogine's work .... are potentially more exciting and moving even than Essendon's recovery in the final quarter?"(9)

So you can imagine how delighted I was to read of the proposed establishment of a new institution, the Centre for Human Aspects of Science and Technology as a body which will look at human problems and possibilities arising from the scientific and technological revolution. I would want to give my enthusiastic support to this proposed venture. I congratulate the Faculty of Science for adding a social and human dimension to its centenary celebrations. Indeed, one of my disappointments in the program for the centenary of the Faculty of Medicine of this University was its neglectful inattention to the social implications of medicine. It is timely and it appropriate that the Faculty of Science should contemplate this initiative. One has only to reflect upon how strange such a proposal would have seemed to the Reverend Badham and the founders of the Faculty to pose the question: What will it all be like in 100 years from now? Will this Great Hall still be here? Will humanity have survived? Will our human form have changed, adapted by genetic engineering and implanted micro computers to enhance the capacity of the science graduate elite of 2085? Contemplating these things makes it important to state at the outset that any review, in the tolerably available time, of the law and science in the next century must be problematical and superficial in the extreme. Futurology is a necessary but partly discredited activity. It is a dangerous activity in the context of the changes of science and technology which must be regarded as now in contemplation - let alone those which will come from the fertile mind of man in 100 years.

## SCIENCE AND LAW

Talking about the relationship of science and law has come to be in vogue in recent years. In May 1982, delivering the inaugural presidential address to the Law Section of the Australian & New Zealand Association for the Advancement of Science (ANZAAS), Professor Douglas Whalan of the Australian National University asked, relevant to the science/law relationship: "Are lawyers really necessary?" I will not give too many guesses about his answer. Yet it is notable that it took 52 Congresses before law was even admitted to ANZAAS. Of course, the scientists who kept law out were only equalled by the lawyers who wanted to have nothing to do with science. The concept of law as a set of positive rules, laid down by a sovereign able to impose sanctions for their breach, distinguished law from the work of scientists and technologists. But the growing realisation of the social importance and uncertain operation of the law and of science, together with an appreciation of the functions of the social sciences in understanding it, led to the final admission of the discipline to ANZAAS in 1982. It is now one of the more robust sections. Perhaps the scientists should be on their guard lest strident lawyers seek to take over the organisation!

Professor Whalan called attention to the formulation of laws on privacy (relevant to informatics) and transplantation (relevant to biotechnology). He stated that we were then starting to look at in vitro fertilisation and plant patents. He pointed out that we were beginning the debate on genetic engineering and the law and on whether life should be patentable. Perhaps of interest is the fact that the very first article in the 1982 volume of the *Australian Law Journal* is on "The Use of DNA and the Law in Australia,, by Professor Douglas Fisher of New Zealand.(11)

Professor Whalan's thesis was simple. Lawyers, he contended, should anticipate rather than simply react to scientific developments. They should not monopolise the law reform and law development process. On the contrary, they should invite the participation of the scientist and technologist but also of the economist, the philosopher and many others as well.(12)

Unsurprisingly the balance of Professor Whalan's essay was directed at issues of biotechnology; foetal experiments, cloning of mammals, in vitro fertilisation and what he described as "the genetic engineering dilemma". I say 'unsurprisingly' because of the fact that Professor Whalan has been appointed to the DNA monitoring committee of the Federal Government. He is the lay-representative on that committee of scientists. But what will be the participation of scientists as the law increasingly addresses itself to public concerns about developments of science affecting society?

Professor Fisher is another law professor who has interested himself in the science/law relationship. In 1984, delivering the Hudson Lecture at the Wellington Branch of the Royal Society of New Zealand, he adopted as his topic the rather melancholy title "Science and law – an unbridgeable gap?". At least he posed this as a question and not as an assertion. His remarks are highly relevant to the topic I have been assigned. Like Professor Whalan, his area of knowledge and expertise has been very much in the field of environment law and biotechnology. Much of his lecture is addressed to DNA and the law, and the need for effective but not unduly intrusive or uneconomic regulation of those activities involving the manipulation of DNA that may pose an acceptable risk of injury to individuals and society.

In his opening remarks, Professor Fisher<sup>(13)</sup> suggests that science and law are "at the opposite ends of the fulcrum of human activity". Yet, although the two disciplines have different purposes, characteristics and methodologies they are, he claims, in several vital respects inextricably interrelated – each having an impact on the other.

Apparently unconcerned by quantum theory, Professor Fisher, a Professor of Law at the Victoria University of Wellington, New Zealand, asserts that science is totally self-contained. It is concerned with knowledge about substances with a view to describing their properties although susceptible to ambiguity and uncertainty of interpretation as any rule of law, the basic subject matter of the discipline has objective reality.

Law, on the other hand, is an artificial entity created by man for his convenience. According to Fisher, the law can prescribe how man may or may not interfere with processes by the use of science and technology. It is the formal mechanism through which society expresses its values and aspirations. It is an artificial rather than a natural phenomenon, "theoretically self contained and objectively identifiable". But with science, law shares the fact that difficulties arise because of the involvement of human beings. And at its core the law is prescriptive whilst the function of science is primarily descriptive. Fisher contends that it is this prescriptive function of the law which compliments the nature and role of descriptive science. He asserts that it is not only true that the legal system is conservative. It is inevitable. Science and technology provide the bases for new objectives, directions and values in society. The law provides the mechanisms for bringing these about or, he could have added, for frustrating their achievement.

The paramountcy of law as the reflection of the will of society may sometimes seem to be a fairy tale, like the old belief that the common law always existed and needed simply to be "found" in the bosom of the judges. It is romantic to think of the law as an accurate reflection of the wishes of the community. Often the laws administered by the courts bear little relevance to the conduct of society. We have only to think of laws which are honoured in the breach rather than the observance. Laws on gambling or the so called victimless crimes come immediately to mind.

In default of modernisation and reform of the law, it is not at all unusual for a statute passed in an earlier century to have an unexpected and wholly unintended impact on some practical development of science or technology today. Equally, the common law, found in judicial

decisions handed down in different circumstances and different times even centuries before, can apply to fill the void of legislation. Thus the new problem of the revival and ushering into life of deformed and retarded neonates is determined by judges applying principles laid down in an earlier time before the advent of sophisticated technology which, in combination with heroic efforts, may save babies who in an earlier generation would have died in the course of nature. The law insists upon the best efforts to revive and sustain the impaired baby. However medical practice often varies from this standard and public opinion almost certainly supports that practice.<sup>(14)</sup>

Sometimes laws are developed specifically to address a new scientific achievement when that achievement is perceived as morally or socially unacceptable. The clearest recent example of this reaction is the legislation introduced in England to forbid surrogate birth arrangements<sup>(15)</sup>, and the legislation recently introduced by Senator Harradine into the Australian Senate, designed to prohibit embryo experimentation. The advent of new scientific developments creates new potentials. If it is possible to “grow” a human embryo in vitro for the purpose of aiding infertile couples, should moral or positive law require the scientist to discard the embryos excess to use? The creation of multiple embryos seems to be an inevitable part of the chancy business of facilitating conception and the development of offspring genetically linked to the parents or one of them. But if human life begins at the moment of conception, as some claim, the destruction of the excess embryos is tantamount to murder – if not in law, then at least in moral principle.

On the other side of the coin are the scientific “utopians”. They point to the potential benefits of these scientific developments. And not only for the couple immediately involved. For example, such commentators may claim that far from discarding excessive embryos, they should be put to good use, with experiments which may provide infinitely useful data because of the special value of human embryonic and foetal material. Why discard such material, they ask, where it could be so useful to humanity? A recent report in Britain urged that experiments with the human embryo should be permitted until the 14th day. That is just before the “primitive streak”, which was thought to be the first relevant and undisputable signal of the change of the primitive embryo of cells to the beginnings of human form. The Warnock Report, by majority, recommended in favour of this permissible zone of scientific experimentation. But the opponents, including Senator Harradine, regard such experimentation with human life as totally unacceptable. For them there is no room for negotiation. And that is why they urge the introduction of legislation designed to stop such experimentation in its tracks. Rightly, they point out that in default of legislation such experiments will take place. Upon them, they claim, the law should not be silent. It should speak with a clear voice. It should speak for society. It should speak to the scientists and tell them that they should go no further for fear of the reduction of human life to the status of a thing an object. The law defending human standard should speak out clearly. But what are those human standards?

Opponents of the legislation introduced in Britain to prohibit experiments with embryos point to numerous objections: the impossibility of regulating such matters on a local or even national basis only; the difficulties of enforcing such laws; the double standards and artificialities alleged to arise; and the unacceptability of the enforcement of the morality of some upon the future of all. Furthermore, some commentators have suggested that such laws made by politicians and lawyers fall heavily, not upon those making them, but upon those who are deprived of the advantages which scientific experimentation may bring: the infertile couples, the couples deprived of early detection and prevention of genetic defects in offspring, the sick and dying deprived of the benefits that flow from scientific experiments.

The difficulty of using the law as a means of regulating scientific advance is called to attention in many instances. In the issue of *Science* for 15 March, 1985, a leading article deals with the benefits and risks of vaccines. Provocatively, the writer asserts that whereas in earlier centuries, the hero was the explorer who blazed trails through hostile terrain to discover new worlds and wealth, nowadays he is the victim who blazes trails through hostile lower courts to establish a new precedent for law suits and wealth.<sup>(16)</sup> The point being made is the inevitable risk of some scientific procedure. It seems that, even today, the risk of vaccination is 1 in 100,000. Of course, for the one involved and the family concerned that risk is intolerable. In the courts it may sometimes sound in substantial damages. But the point made in the commentary in *Science* is the apparently cold hearted and clinical assertion that scientific advances, made in human, economic and social terms, benefit overwhelming numbers but at some cost. Is the law by direct regulation to prohibit such activity, upon some perception by the community of moral standards? Or is the law to stand back, countenancing the built in risks because of the greater benefits. The editorial in *Science* concludes:

“At some point the judicial system will have to face the most inexorable of all laws, the law of probability. Risks of disease and harmful side effects from vaccines is steadily being reduced, but they will never be absolutely zero. ...with drugs and vaccines some national compensation system in which medical costs, lost pay and so are calculated on appropriate statistical basis will need to be inacted ... [W]e may be able to introduce into Government the concept of a statistical morality as the foundation of a more rational approach toward all compensation situations. The next hero may be the statistics advocate who has the courage to say: “the healthy can afford to help the sick, but we do not live in a risk free world,,”

## **THE MIGHTY MICRO**

But if these problems of biotechnology are severe and controversial, the pervasiveness of the mighty micro presents difficulties just as acute for our society and its laws. I learnt something of these issues in the time I spent as Chairman of an OECD expert group studying the phenomenon of transborder data flows and the protection of privacy.<sup>(17)</sup> The challenges to the law by reason of the international developments of data traffic are enormous. They derive from the universal, pervasive and international character of this new technology. The questions for the lawyer are many. They include the impact of this new technology on:

- the vulnerability of society – when vital data may be stored in a few tapes, vulnerable to accident, terrorism, natural disasters and criminal conduct.
- the criminal law, which has developed as a phenomenon of local sovereignty, and is normally strictly confined to its own jurisdiction, but may have to adapt because of the potential of informatics. A message may originate in country A, be transmitted through countries B, C and D, be switched in country E and ultimately do harm in countries X, Y and Z – Whose criminal law is to apply to such a case? Whose police forces are to investigate the anti-social conduct? Whose courts are to have jurisdiction? Whose laws of evidence and procedural laws are to govern such cases?

- the laws of copyright and intellectual property generally, the laws of contract, the rules by which conflicts of laws are reconciled: all of these will have to adapt to the international character of informatics. In a real sense the new technology will facilitate and demand the development of international law.

In the field of privacy, the OECD guidelines, recently acceded to by Australia, lay down certain rules which should be observed in the movement of personal data. The Australian Law Reform Commission conducted a major review of this subject. It has recommended<sup>(18)</sup> the introduction of Federal legislation for the better protection of privacy in Australia, including in computerised personal data systems. It is understood that legislation based upon the Commission's report may be expected to be introduced in the Parliament some time in 1985. Of course, there are those who contend that it is impossible to protect privacy, given the pervasive and overwhelming character of the new technology and the speed with which it is being adapted, developed and accepted. But those features of the technology seemed to the Law Reform Commission (as they seem to me) to be argument for the development of flexible laws not reasons for abandoning altogether the endeavour to state basic principles and, where necessary, to enforce them.

One does not have to peer into the distant recesses of the 21st century to see a practical case concerning the tension between new technology and old legal principles. One can see it in a contemporary instance which illustrates my point. I refer to the suggestion that Australia should adopt a system of universal identity cards: doubtless computerised, infallible and assigned to all of us at birth. This well meaning proposal has been advanced by a number of unlikely advocates, the most vocal of whom has been a spokesman for the Australian Taxpayer's Association. In the kindly and admirable concern to help the administration to beat tax avoidance, it has been suggested that all of us should have this universal identifier. By this means the tax cheat (and doubtless a few other anti-social persons) will be caught. No one will be able, so it is claimed, to take cash on the side. Somehow the problem of tax avoidance will be dealt a mortal blow, in a single stroke, by requiring everyone to have a foolproof universal identifier.

Public opinion polls conducted by radio stations apparently disclosed strong support for this idea. One Sydney poll reported to me showed an 87% vote in favour of the proposal for Australia-wide, universal ID cards. Mind you the sample was small (450) and not scientifically gathered. Furthermore, in an article in the *Daily Telegraph*, which has been conducting a single minded campaign in favour of the 1D cards, Federal political writer, Ian Collier said this:

“What is remarkable is not so much the support but the lack of opposition to the proposal. The Labor Party left wing has remained silent. The only opposition so far came in the speech by Justice Michael Kirby ... Justice Kirby said the ID cards smacked of a Big Brother ideology. He said the cards would provide the authorities with an excellent method to keep tabs on us all. But many people who once would have supported Justice Kirby's remarks now believe they are irrelevant.”<sup>(19)</sup>

This essay comes under the heading “Time May be Ripe for ID Cards”. Significantly, perhaps, the print media, including the *Daily Telegraph* did not see fit to reproduce my remarks, although they were available to them and did appear in some of the electronic media. It never ceases to surprise me that the Australian media – suggested (and frequently self-proclaimed) defenders of our freedoms – are often happy to support their diminution, save where they perceive an element of self-interest. If the prerogatives of the media are involved, they tend to be loud in their proclamations of freedom. For many media writers in Australia, the only freedom is freedom of the press.



There are, of course, other elements of freedom. They will be surely tested in the century ahead by the developments of science and technology. ID cards are simply a relevant, current, vivid illustration.

The arguments for such cards are arguments of efficiency. Certainly, we would catch a few tax cheats. Doubtless we would catch a few criminals as well. What then are the arguments against? This is difficult for lawyers to explain. And yet it is important that the explanation go forth so that it can be considered in any decisions that are made.

The following is my short list of reasons for opposing this apparently seductive use of the new information technology:

1. I am not convinced that it would be especially effective. I recently heard Mr. John Howard, Deputy Leader of the Opposition, say that information available to him from the United States suggested that the cost of a universal identifier outweighed its potential benefit. This seems sensible to me, given that people who engage in tax avoidance will, in any case, frequently transact their activities in cash or kind, avoiding the record that would be picked up by an ID card.

2. But even assuming effectiveness, we do not make all decisions touching our liberty by reference to efficiency. Of course it would be more efficient to tap telephones without limit. Of course the criminal law would be more effective if we terrorised our people with barbaric punishments, detention without trial, spies in every street and the panoply of the police state. We do not do so. Significantly opinion polls show that about 75% of the population supports hanging. Yet I have not heard any responsible politician in the Federal Parliament urging the restoration of that form of punishment. Sometimes majorities can be wrong. Sometimes, out of ignorance, they can be too ready to throw away ancient freedoms or hard-won liberties and reforms. And sometimes they embrace ideas which they later reject with indignation, when the full enormity is brought home to them.

3. Efficiency is not all. This was vividly illustrated to me when I attended a conference on informatics held in Paris in 1980. When the spokesmen of the new information technology were urging the need for a computerised identity card in France a man, in alarm, rose from the audience. In vivid French, he reminded his listeners of the fate of the Jews in wartime Europe. Why was it, he asked, that 90% of the Jews of the Netherlands perished? Why was it that 60% of the Jews of France survived? At least part of the explanation he attributed to the fact that the Netherlands, with its efficiency, had produced an identity card which could not be forged. The French, though they had an identity card, produced it negligently. It could be forged. Many Jews and many heroes of the Resistance, Allied soldiers and others survived to see the reestablishment of a freedom in France because of this inefficiency in the identity card. Efficiency is not the only social virtue. Calls by, of all people, the Taxpayer's Association for efficiency in tax collection must be weighted against the respect for our civil liberties. It is forty years since the end of the Second World War. But for some people that is a time for speeches and military parades – not as I would assert, a time to reflect upon what all the dreadful sacrifice was about.

4. This brings me to the principal argument. Despite the advance of informatics (under which such universal identifiers may not even be necessary) there is always a risk that the assignment of an identity number and card to every individual will attract a change in the relationship between the individual and the State. There is a risk that if people have identity cards they will next be required to carry them. If they carry them, they will next be required to produce them. If they have to produce them, they will have to produce them to the officials of the State. It will start with security. It will move to regular police. It will expand to customs officers. It will

end up with many in vast array of officialdom: empowered (all in the name of efficiency and the due administration of the law) to stop citizens in their daily lives. To intervene in their lives. To intrude into their private zone – and this without the present safeguards which prohibits such intrusions, generally, unless the persons so authorized have reasonable cause to suspect the commission of an offence. If you say this is alarmist talk, consider telephonic interceptions. Once it was unthinkable that the privacy of the Royal Mail and the telephone should be invaded. And then came exceptions for national security. Next came cases of drug surveillance. Then there were exceptions for special circumstances. Last week another exception for cases of life and death reached Parliament. Who knows where this diminution in the confidence in telecommunications will end up? If you believe some editors of our newspapers, following the so-called Age tapes, it is very naughty to tap telephones; but it really does not matter very much – unless a journalist's phone is tapped. Privacy, it seems, is a value that is being eroded, but we should only be selectively concerned.

And fifthly there is the point of personal autonomy. In our kind of society individual human beings are people - not numbers. They are not to be reduced to a mere electronic number on a national and universal identifier. They may be in various systems by their own choice or by reason of particular laws. But there is, as yet, no universal system. Provide a universal identifier and you provide a universal data base which will collect increasing data about us all, producing the ultimate triumph of the authoritarian state which even Orwell and Kafka would not have dreamed possible. In inefficiency sometimes lies a defence to freedom. In a sense, that is one of the reasons for the Federal form of government, if you think about it. A few days ago I was reading an article by Gary T. Marx in *Dissent*. Marx drew attention to the hit song by The Police titled "Every Breath You Take".<sup>(20)</sup> It was, he said, a warning of the new surveillance. Listen to the words and to Marx' counter-point:

“Every breath you take, [breath analyser]  
Every move you make, [motion detector]  
Every bond you break [polygraph-lie detector]  
Every step you take [electronic anklet]  
Every single day [continuous monitoring]  
Every word you say [bugs, wire taps, mikes]  
Every night you stay [light amplifier]  
Every vow you break [voice stress analysis]  
Every smile you fake [brain wave analysis]  
Every claim you stake [computer matching]  
I'll be watching you [video surveillance]”.

It may be that there is little that we can do about the new surveillance. Some of it is thoroughly beneficial and highly desirable. Much of it takes place with the acquiescence or even the active participation and encouragement of fellow citizens. The zone of privacy diminishes every day. But that is not to say that we should simply wring our hands and abandon the proper role of the law and of our institutions in defending our hard won freedom and individuality.

This is not a melancholy lament for the return of the good old days. The advent of informatics brings in its train many consequences that will not go away. But lawyers have a part to play in reminding society that even in the age of informatics even in the next century of science and technology – important values must be preserved. The role of the State must be contained. Indeed, it must be contained with special vigor, because the science and technology that is about us, arms the State and its agencies with seemingly limitless powers: to change or facilitate the change of our very nature and species. to intrude into, monitor and control our every day life

even to its private moments and ultimately, to destroy us all, unless, as human beings, we are vigilant and assertive. Let this great power be controlled.

## WHAT IS TO BE DONE

The moral of this tale is not that we should favour foetal experiments. Nor is that we should mount the barricades over identity cards. Still less is it that we should join the peace marchers and protest against nuclear weapons. Those are matters that must be left to politicians and to individuals.

But the lessons which I would derive from the efforts of our society, since the Second World War, to adapt to the age of science and technology are these:

1. First, we must make greater efforts to improve our education system so that increasing numbers, including increasing numbers of women who tend to be neglected in science education, will be trained in the basics of science. It is no longer acceptable, for the educated person to be ignorant of Quantum Theory or oblivious to the basics of DNA. Bronowski warned that to ignore science and technology today was to walk, with eyes open, towards slavery. I agree with that warning. We should take heed of it in our educational system so that we produce new generations of Australians who are not illiterate in the basic moving force of the world they live in. [\(21\)](#)

2. Secondly, we must encourage greater communication on the part of scientists with the community whom they so profoundly affect. That is why the moves of this Faculty to promote community awareness and to institutionalise it, are to be welcomed. The dangers of failing to do so are a mindless advance of science, indifferent to the needs and wishes of the people or, equally unacceptable, the mindless interference by organised society to stop scientific advance out of fear of where it may lead us, rooted in ignorance.

3. Thirdly, consideration must be given to our institutions. How are our laws in an age of mature science and technology to be developed and adapted? How are the judges who make the common law to be sensitised to the values of scientific research and the needs to reconsider old precedents, adapting them to the potential benefits of technological advances? The opportunity costs that are involved in research forbidden by law may be enormous. The blunt weapon of legislation or curial pronouncements, may unacceptably intrude upon the onward advance of scientific progress.

4. But fourthly, society has the right, ultimately, to pronounce the circumstances in which science and technology shall take place. They exist to serve us. We are, and should remain, the masters, not the abject slaves of the technological engine. Of course, there are limitations. Science is a world wide phenomenon. It is difficult to stem the tide of its onward rush in one country, when it remains unregulated (and even possibly encouraged) in another. But the fact that others do not defend themselves is not a reason for surrender and capitulation. [\(22\)](#) Our legislatures have their own responsibilities to define the future shape and nature of our country. It is to be hoped they will do so, conscious themselves of what is at stake and reacting to a democracy that is itself literate in the field of science and technology.

5. Finally, our legislatures should, in my view, neither gnash their teeth and rent their clothes (as did the prophets of old) nor abandon their responsibilities to maintain the fundamentals of our society. They are our guardians. Our institutions will need to adapt. Above all they will need to develop laws affect ing science with the full participation of scientists and of the community.

And that is the only optimistic note upon which I can finish this review. The involvement of scientists in law development has now begun. In the field of human tissue transplants, the Law Reform Commission involved many of the finest medical scientists throughout the country, together with theologians, philosophers and many others. The late Professor Sir John Loewenthal of this University was a leading consultant to the Commission. Similarly in the Law Reform Commission's work on privacy protection the scientists, the computerists, the police intelligence experts and others were all closely involved. Professor John Bennett of this University took a leading and constructive role in the work of the Law Reform Commission on these new laws. That is the way it will be in the future. Not lawyer, lost in his classics, disdainful of the world of the scientist. Not the scientist, immersed in his equations and formulae ignoring the lawyer. But each communicating with the other in a language which the other understands.

When in a 100 years this Faculty meets to celebrate its second century of achievement, I do not doubt that the dialogue of science and the law and the relationship of science to society - will be at the top of the agenda. I hope that, in the meantime, we have been able to preserve our existence, our species and our precious human liberties.

## FOOTNOTES

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