CURTIN UNIVERSITY OF TECHNOLOGY

PERTH, WESTERN AUSTRALIA

DISTINGUISHED LECTURE SERIES 1988

"DISTINGUISHING MARKS OF AN EDUCATED TECHNOLOGIST"

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The Hon Justice Michael Kirby CMG*

THE REWARDS OF INEFFICIENCY

Inefficiency is rarely rewarded in our busy user-pays society. A certain planned inefficiency may nonetheless have hidden benefits. Thus, the Federal system of government is not particularly efficient. But the division of powers which it offers may be specially appropriate for the protection of diversity and freedom in the age of the computer. Napoleon, it is said, indulged a certain planned inefficiency in answering his correspondence. His normal practice was never to answer a letter until six months had elapsed. If the subject matter was still relevant, then it was truly worthy of the Emperor's attention.

I suppose it represents the delusion of grandeur which comes with judicial office that I have imitated a Bonapartist approach to this talk. So inefficient was I in the preparation of my remarks that the other lecturers - all busy people - had prepared their broadcasts by the time I got round to mine. I therefore secured, by sleight of hand, a preview look at the transcripts of their remarks. What a feast is there. What can I possibly add to such a galaxy that will not be repetitive, banal or superfluous - in the light of all that has gone before?

The answer to this question is obvious. I must stick to my last. If I were to pretend to be a philosopher, Professor Charlesworth's reflections would show me up. If I were to approach the subject from the history of science and technology, my contribution would pale into insignificance beside the insights of Professor Mervyn Austin. If I were to examine the subject from the viewpoint of the academic educationalist or the university administrator, surely I would have nothing to say that had not already been offered by Dr Kay Daniels or Vice Chancellor Donald Watts. If I were to endeavour to peer into the future, how could I compete with my old friend Ian Lowe, now Director of the Commission for the Future?

Each of the other lecturers, who has held up this diamond, has presented his or her perspective of its glimmering facets. I must do the same. For me, the fascinating aspect of life in the law as we approach the 21st century is the impact upon this ancient discipline of science and technology. But have you ever thought that the counterpart of that impact is the interaction of law upon scientists and technologists? The law, in our tradition, is 700 years old. It is inherited mainly from England. Our country, which this year celebrates the 200th anniversary of European settlement, was established as an offshoot of the English legal system. The loss of the American colonies, and the need to relieve the pressures on the prisons of England, led to the adventure which culminated in the colony at Sydney Cove. It led on to the conquest of this continent; to a remarkable tale with many mistakes, but many achievements as well.

The distinguishing mark of our age is undoubtedly the dynamic force which is at work in science and technology. In such circumstances, it is inescapable that science and technology should affect the law. For the law provides the basic rules by which we live together in society and in the world. It is a particular aspect of this interaction that I wish to isolate. It represents, for me, the distinguishing mark of an educated technologist in the world today.

Let me come to my point directly.

I prepared these remarks soon after returning from the 4th International Conference on AIDS. It was held in Stockholm, Sweden. All about us was the evidence of what Ian Lowe described as "Sweden's success in social management of technological change". A week was set aside for the Conference. My task was to sum it up in the closing plenary session. The organisers put me up in the Grand Hotel. My balcony faced the Royal Palace in the inner harbour of that beautiful city. In the same rooms, succeeding generations of Nobel laureates: some of the best minds of humanity had come, on their way to receiving their Prizes. A century of scientific and technological "greats" had walked down the same corridors as were now teeming with the AIDS delegates. 10,000 of them crammed into the busy, efficient Swedish capital to address a tremendous and puzzling challenge to the health of the world.

Amongst those participating was the fabled Jonas Salk. Others included David Baltimore, who at 36 had received his Nobel Prize for original work in molecular biology. It was the

original work of Baltimore and others which provided the tools for the isolation and description of the AIDS virus by Professors Montagnier and Gallo in a remarkably short time after the condition of AIDS had first been desscribed.

As you can imagine, 10,000 people with different backgrounds, cultures, languages and disciplines - crammed into the one conference centre - presented enormous logistical problems. Just feeding such an army required the feat of cool Swedish efficiency.

In the basement of the Conference Centre was something I had seen before in scientific conferences but never in a legal conference. 3000 posters were on display. They detailed original scientific work being done by investigators on every continent into the myriad of problems presented by AIDS. Mid-morning every day, the plenary conference would break. An hour or so would be set aside for the delegates to wander amongst the posters. Perhaps there could be gleaned some original thought which, with serependity and luck, would come together in the advance of thinking which would ultimately conquer this strange and deadly retrovirus, with its unexpected threat to humanity.

By the end of the week - as my address approached - the mood was sombre. There were no dazzling breakthroughs. Much of the social data was worrying. The epidemic continued to spread. There was even a risk that the numbers affected were greater than had previously been considered. No miraculous new treatments were reported. Vaccine trials had begun. But these had been criticised by some scientists, including Baltimore.

He suggested that, launching into vaccine trials with this particular virus, before more pure research had isolated its nature and relevant features was like an athlete running in a long race without having first acquired the necessary running boots.

By the last day, then, there was a feeling of frustration in the air. And it boiled over in a predictable direction. Calls began to be made for the splitting up of this international conference. What was the use of bringing together so many people? Attention turned to how the split could be achieved. The readiest solution put about the corridors was the simplest one. Let's divide the "real" scientists off from the social scientists. Let those concerned with virology, epidemiology and the treatment of AIDS have a separate conference, untroubled by the noisy social scientists. By all means, let them have their own conference to indulge their imprecision, disputation and "soft" concerns. Then they could get on with their affairs whilst the scientists, with more despatch, exchange knowledge about the scientific and medical aspects of AIDS.

This reaction was understandable. But it was wrong. At least with AIDS, and at least at this stage, with no vaccine or cure, it is necessary to keep the scientists and technologists in close communication with the social scientists - and even the lawyers. The social scientists without the physical scientists would be neutered in such a topic. But the physical scientists, unaware of (or unconcerned with) the moral, political, economic and legal implications of their research, would fail utterly to put that research into its essential context.

I opposed the notion of splitting the conference. I understand that the conference next year in Montreal will continue with the universalist approach: gathering together all the disciplines. Heaven knows how, in two years time, at the San Francisco conference, the world will cope. But it will depend upon the progress made in the meantime in our understanding of the virus and in our understanding of the effective way of containing it (if we cannot prevent its acquisition or cure it, once acquired).

These remarks, by way of introduction, bring me to my perspective of the distinguishing mark of today's educated technologist. Such a person does not wish to go off into the comfortable work of a specific discipline, indifference to the implications of what is being done for family and friends, the community, the nation and the world. Instead, such a technologist is concerned about the impact of science and technology upon the environment. And this includes its impact upon the laws which govern the community and upon the human rights of those who live in it.

The debates which framed the modern statements of human rights preceded the tremendous developments of science and technology that have occurred since the Second World War. In essence, the statements of human rights which we have inherited in Australia, and other countries, represent the formulation of what were thought to be important attributes of humanness at the time of the American and French Revolutions. The time is now ripe for us to reconsider the content of human rights in an age of mature science and technology. And in that reformulation, the educated technologist has a vital role to play.

For example, in a country of markedly declining church attendances and in which agnosticism is rapidly increasing, lengthy reflections upon freedom of religion (although not to be disparaged) may be of less immediate relevance to the real human rights concerns of today than precise provisions about freedom from undue invasions of data privacy. Yet, in Australia in 1988 we are considering a referendum proposal concerning protection of religious freedom in the context of State laws. Is this yet another instance of how long it takes the legal system to catch up with the reality of the pressing concerns of the present?

In a country in which the media of mass communications, printed and electronic, are in very few hands, a guaranteed right of access to information and to use of the media may be of more significance to the pressing human rights of citizens than generalised statements about free speech and a free press. Such remarks are not to disparage the importance of proposals for an Australian Bill of Rights, stating the old collection. But they are to make the point that the world has moved on. New and different problems have presented themselves to humans today. Most of these problems may be traced to science and technology.

Until quite recently, the general attitude of informed people in countries such as our own was that the benefits accruing to humanity from scientific discoveries, and their application through technology, were essential attributes of human progress and overwhelmingly beneficial. But now, reflection upon the terrible destruction of the two World Wars,

and about the more limited conflicts since 1945 - together with concern about thecapacity of modern weapons of nuclear, chemical and bacteriological warfare to cause suffering and even annihilation of humanity - has more recently produced a somewhat more pessimistic mood. Increasingly it is recognised that not all science and technology is good for humanity. Even scientific developments which are generally thought to be beneficial (such as the reduction of infant mortality and the "green revolution" in agricultural production) may produce an explosive increase in population which puts unacceptable pressure upon food supply, living space and economic resources. Similarly the computer, which brings so many benefits, may abolish much routine labour and undermine the capacity of developing economies to fulfil the human right guarantee of the right to work. The jumbo jet, which contributes to world peace by moving about the Earth large numbers of humanity, is also a vector for the spread of the AIDS virus.

All of this is simply to point to the implication of science and technology for society and, specifically, for human rights. Educated technologists will be aware of these implications and sensitive to them. Moreover, they will perceive that an aspect of being an educated technologist in today's community is to have, and exercise, a responsibility for the state of human rights. This includes the human rights affected by science and technology.

THREE MODERN TECHNOLOGIES

The special feature of our time is the coincidence of a number of major technological developments with enormous potential for human society. Chief amongst these are nuclear physics, information technology and biotechnology. It is notnecessary for my present purposes to debate whether, as is sometimes claimed, the main scientific and technological developments themselves have a common origin, in Erwin Schrödinger's work on quantum physics. It seems likely that there is a unity there. But it is sufficient to take each of these principal developments and to point to some of their implications for human rights which should be of concern to the technologists involved.

Take, first, nuclear physics. Concern about the impact on human rights of this technology derive from the unprecedented destructive force of nuclear weapons. Without human life, talk of human rights, and indeed of science and technology, is pointless. Therefore, concern about the manipulation of nuclear fission in the form of weapons naturally attracts the attention of those anxious about the future of human rights on our Planet.

Because of the risks involved in nuclear materials, it has been thought necessary to provide safeguards for nuclear establishments. But these are themselves capable of "insidious, gradual and deleterious change in the nature of free societies". To some, the supply of cheap electricity from internationally reliable fuel suppliers is a matter of paramount social need. But the other point of view is

expressed in the aphorism that it is better to "rather read the Bill of Rights by candlelight than not to have it to read at all". The growth of international organisations of professional people concerned about the risks of nuclear war - or, even more likely, accident or mistake - represents the response of thinking people to the peril facing humanity after Hiroshima. To those who consider that we have done well in the past 40 years, others respond that our position is akin to that of the person falling from the skyscraper who, reaching the 50th floor, says "so far, so good". To those who consider that the dangers of nuclear technology can be out of mind, as beyond the capacity of ordinary people to influence developments, the answer comes back. What does it matter if we solve minor problems of everyday life but leave unattended the implications of the major technology that can destroy the life of all?

Concern about the new information technology, and its potential to endanger human rights, was perceived soon after the computer came on the scene. Some of the early commentators were computer scientists themselves. The capacity of the computer to assemble, at ever increasing speed and diminishing cost, vast amounts of previously unavailable data upon every individual diminishes privacy and anonymity. It increases the potential power of the organised state over the life of each human being.

It goes without saying that information technology brings mighty benefits. The very revolution that is occurring in the Soviet Union at this time is less the product of economics or even the personality of Mr Gorbachev. The greatest force for

change is the new information technology itself. Here is the paradox. The photocopier, international broadcasts and transborder data flows diminish some of the power of the state over information flows. Yet, at the same time, the increasing power to collect information on individuals in central registries enhances the potential intrusiveness of the authoritarian state in the lives of all of us. It was this fear which led, in Australia, to unprecedented civil reaction against the Australia Card and to concern about the new, but not universal, tax number system.

The power of the state to intercept telephone calls and to manipulate and control some sources of information, presents new challenges to human rights different from those of the past. It is essential that the modern technologist should be aware that infomatics brings in its train a mighty impact on the society it permeates.

The popular consciousness is increasingly aware of these things. So much can be seen in popular music. A recent hit "Every Breath You Take" by the Police, was a political tract disguised as a popular ballad. Every line of the apparent love song was pregnant with a social message:

Every breath you take [breath analyzer]
Every move you make [motion detector]
Every bond you break [polygraph]
Every step you take [electronic anklet]
Every single day [continuous monitoring]
Every word you say [bugs, wiretaps, 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 is not good enough to leave the social implications to others - picking up the technological paraphernalia and walking away. It is essential that the technologist should feel a sense of responsibility for the technology he or she produces. The technologist, after all, is a human being first, and thus shares with the rest of humanity basic human rights inherent in the individual as human. The technologist has insight into the likely future course and should be able to see many of the implications of the technology in hand. It thus becomes a responsibility of the technologist to reflect upon the social implications of what he or she is about and to interpret them for the technologically ignorant. This is particularly true in modern circumstances, where an understanding of technology has frequently gone beyond the capacity of even well educated citizens.

If the problems presented to human rights by the work of nuclear physicists seem intractable, and those presented by computerists are recognised as large and pervasive, the developments of <u>biotechnology</u> are, in some ways, the most perplexing.

- What rules should govern the transplantation of organs from one person to another, once the body's immune rejection is overcome? Should we all be deemed to be donors of organs at our death or should a protective donation be specifically required? Should a child be able to donate organs? Should a surviving relative have the right to veto the gift of the deceased? Is in-vitro fertilisation just a technical procedure to overcome infertility? Or does it alter radically the whole basis

of human conception? What is to be done to fertilised embryos excess to use? What is the status of such an embryo if the natural donors of the sperm and egg die in the meantime? This, you will recall, is the problem with the rich American couple, Mr and Mrs Rios, who were killed in a plane crash. They left fertilised embryos in a hospital in Melbourne. Lawyers asked: could these tiny specs - humans in potential - inherit the huge estate?

- Is surrogacy (i.e. one woman carrying the embryo of another to full term for another) a permissible variation on the norm of conception? Or is it an intolerable interference with nature using a woman as a human incubator and raising the prospect that, in future, poor women will have to do this for the rich?
- Is it permissible to experiment with embryos and with foetal tissue in order to advance knowledge of the operations of the human cell? If these are redundant and would otherwise be destroyed, why should that not be permitted? Or does it involve a degradation of what was a human life in potential?
- What are the cost implications of biotechnology? In a time of scarce medical resources, can the expenditure of $50,000 to produce the possibility of a child for an infertile couple be justified? How are ethical decisions of this kind to be made? With the advent of radical technology, economic choices must be faced up to which effectively decide life and death. When should the life-support system be discontinued? When will a CAT scan or nuclear magnetic resonance be made available? When

will IVF be permitted? When will dialysis be provided? The ethics of economics in matters of biotechnology are increasingly recognised.

Is cloning of the human species to be permitted? We all know people who have named their child after them. May there not be some, of our acquaintances, who would think that the possibility of leaving the "spitting image" of themselves to the next generation is too great a duty to pass up?

In the medical sphere, it is not uncommon to involve biotechnologists in ethics committees. They play a part in such committees in thinking through the ethical decisions they and their colleagues have to make. They consider the implications of such decisions for their patients and for society. In universities, at the experimental desk, it is now not uncommon to involve the technologist in decisions of this kind. CSIRO, for example, has an Ethics Committee on Animal Welfare. It attends to the ethical implications of the use of animals in scientific experiments. Enlivening a consciousness of the ethical and social implications of their work is the obligation of each scientific and technological establishment. The mark of the modern technologist is a person who thirsts after knowledge and who seeks to put the knowledge acquired into context. Part of this context-setting is the perception of new discoveries as they relate to other realms of knowledge. All too frequently, with growing specialisation, links between disciplines are not perceived. But another vital part of "seeing the connections" is perceiving the social implications - and the moral and ethical significance - of scientific and technological labour.

INSTITUTIONAL CONCERNS

In nearly 10 years that I served as Chairman of the Australian Law Reform Commission, we were confronted in virtually every one of our tasks with some aspect of the impact of science and technology on our society. The first project on police powers took us to the use of telephonic search warrants and arrest warrants to maintain, in a continental country, the superintendence of police action by independent judicial officers. The project on road laws took us to the modern breathalyser and other means of analysing the indicia of anti-social conduct on the roads. The work on human tissue transplantation took us directly into the field of biotechnology which I have talked about. The report on privacy required consideration not only of the impact of computers on data protection and data security, but also of other modern means of technological invasions of privacy - including by surveillance devices and telephonic interceptions. Even a project on admiralty law required us to consider whether that special branch of the law which had been developed for the liability of the owners of ships, should now be adapted to hovercraft, seaplanes, helicopters and other more modern forms of transport.

One of the major institutional problems which came to light in the work of the Law Reform Commission, was the relative incapacity of democratic institutions to adapt to an age of material science and technology. When technological developments go beyond ordinary understanding, it is difficult for the lay politician - and even the lay administrator or judge - to understand the technology and to perceive its social consequences.

It is in this respect that we saw the Law Reform Commission as providing a modern, and highly relevant institution to assist Parliament to cope with the social implications of science and technology. Where scientific developments (such as human tissue transplants or computers) present novel problems to society and its laws, it is essential that the democratic Parliament should be well advised about the social implications that need attention.

And that is why, in the work of the Commission, we closely involved scientists and technologists. They were not, it is true, members of the Commission itself. By the statute, Commissioners are confined to legally qualified or like persons. But in each and every project a team of consultants was appointed. Medical experts on transplantation sat down with judges, lawyers, moral philosophers and others to work out the appropriate law on human tissue transplants. Experts on computers and surveillance devices sat down with laywers, police and others to work out the basic rules of privacy and of data protection. And so on.

In all the many public offices I have held, I have been required to attend many meetings. It is said that the genius of the English speaking people lies in an ability to reduce controversy to routine. This is normally done by constituting a committee. And I have sat on too many of them. But none of the committees I have attended have been so stimulating, insightful and (dare I say) enjoyable as those inter-disciplinary meetings in the Law Reform Commission. The clash of ideas and experience produced a symbiosis of perception.

It disclosed, quite frequently, the different starting points about the social implications of science and technology from which lawyers and technologists tend to approach their moral judgments. The whole process was a valuable one. It led to reports, most of which have passed into law both at a Federal and State level.

We need institutions that can stimulate and help our Parliaments to respond to the social issues posed by science and technology. This is particularly so where the rights of individuals are affected. Then, not to respond may be to make a decision. Precious human rights may be left unprotected and human values unsustained.

I count those periods of my life in constant interaction with scientists and technologists as amongst the most creative times that I have spent. They opened my eyes to the marvellous developments which represent the great engine of our time. They lifted my eyes from the law books to the world we live in. Like it or not, it is a world of nuclear fission, infomatics and biological miracles.

THE BECKONNING PRIZE

It is not coincidental that many of the leaders for the battle for respect of individual rights in countries where they are most grievously denied are scientists and technologists. Yuri Orlov, sentenced to seven years hard labour and five years of "internal exile" for publicising alleged Soviet violations of the Helsinki Accords, is a particle physicist. Anatoli Scharanski, until recently serving a sentence of 13 years hard labour for human rights actions, is a mathematician and

computer scientist. Andrei Sakharov, who was probably the leader of the Soviet human rights movement, is a nuclear physicist and a full member of the Soviet Academy of Sciences. There are many other scientists who could be named. They kept alive the aspirations of human rights in the Soviet Union during dark days. Increasingly, they are now coming into their own. In those dark days, lawyers were, I am ashamed to say, less prominent.

The same has also been the feature of Eastern Europe and of the dictatorships of Latin America. Despite the appeals of the orthodox to distinguish "political" and "scientific" issues, there is a growing debate in the literature about the duty of the scientist and technologist, as such, in relation to scientific work. And about the place of the technologist as an intellectual leader of the community. The coincidence of nuclear fission, the microchip and biotechnology at the one moment of human history - and the potential of these developments profoundly to affect, improve or destroy human life - has mobilised many members of the technological community to a more active concern about the impact of their labours on human rights.

It is clear that the three principal scientific developments that I have mentioned, carry very great implications for society and for human rights. The human rights debate of the future must involve as many scientists and technologists as it does lawyers. The catalogue of human rights developed by 17th century philosophers (and given fresh impetus by the United Nations after the Second World War) needs fresh consideration. Otherwise, statements of human rights

will be silent upon the many really urgent and modern problems thrown up by the science and technology of today. Or, ungainly attempts will be made to stretch concepts developed for earlier times and to apply them to situations which could not have been conceived when the current formulae of human rights were put on paper.

Just as lawyers of today must certainly become more aware of the scientific and technological environment in which they operate, so scientists and technologists must become more aware of, and sensitive to, the implications of their labours for the societies of which they are a part and for the human rights of other individuals in them.

If, then, I am asked to state, from my perspective, the distinguishing mark of an educated technologist, it is, above all, that he or she is human. That he or she is a social person. That he or she perceives and communicates the significance of what is being done and interprets it for other human beings and for human society, including the international community. We are all bound together - each to each - by our common humanity and our duty to peace, development and human rights on this Planet. The technologist who forgets these things is dangerous indeed - as the melancholy work of the doctors of Nazi Germany reminds us. But the technologist with a moral conscience is called to a high mission. Not only is such a person the intellectual leader of the community, but the moral leader as well. It is this prize that awaits the educated technologist of today. For our world and for humanity I hope that this prize will be seized by the educated technologists of Australia. And that their education will prepare them to be worthy of it.