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The Hon. Mr. Justice M.D. Kirby
Chairman of the Australian Law Reform Commission

OF SCIENTISTS AND LAWYERS

In this short talk, I propose to develop a simple thesis. It is that one of the most dynamic forces for change in the law today is the impact on its rules, procedures and personnel of science and technology. And that we should be developing institutions to help our democracy respond to these forces. Many of the implications of scientific change are not being addressed efficiently by the legal order. In part, this is because of the general problem of keeping the law up to date when the principal way of doing so is through cumbersome, sometimes medieval parliamentary machinery, not well adapted to the pressures of change of our time. In part, it is because of a certain problem of communications between scientists and technologists, on the one hand, and lawyers and lawmakers on the other. We tend (with notable exceptions) to speak a different language and to look at the world through difference spectacles. The first group tend to be those who at school were good at mathematics. The second group tend to be those to triumphed in poetry and had a skill with words. Few are the lawyers who are trained in science. One notable exception is Mr. Justice Murphy of the High Court of Australia. He has a First Class Honours degree in Science and maintains his interest in scientific journals. Most lawyers and lawmakers find scientific change mysterious, perplexing and uncomfortable. Little wonder that they tend to put its legal implications into the 'too hard basket'.

Mind you, lawyers and scientists share certain things in common. The law operates on proved, not certain, facts. In this sense, lawyers and scientists are content to work with a notion of relative truth. Claims to absolute verities are left to priests and politicians.

In the short time available to me, there is no opportunity for an elegant discourse on the history of famous legal scientists. Nor can I indulge myself with tales of early legal reactions to scientific heresies. (We burned their authors). Nor is there time for an analysis of interesting forensic cases, such as the trial of Dr. Crippen, gripping though that might be. Instead, I must spend my allotted time telling you something about the Australian Law Reform Commission, detailing some of the cases in which we have proposed law reform to put scientific and technological change to the service of the law. Then, I shall instance quickly the three principal areas of science which I see as promoting special problems for the law. Finally, I plan to say something about a particular subject in the bio-ethical area, which has, so far, received scant attention in Australia.

USING SCIENCE AND TECHNOLOGY

The Law Reform Commission is a permanent body established by Federal Parliament to assist government and the Parliament with advice on the reform, modernisation and simplification of Federal laws. It works only on tasks assigned to it by the Federal Attorney-General. It has delivered a number of reports and a good proportion of them have passed into law, both at a Federal and State level. As I speak, three Bills are before Federal Parliament based upon reports of the Commission. The process is therefore one requiring a blend of principle and pragmatism, for almost every proposal for reform must run the gauntlet of parliamentary consideration, with the special problems of partisan scrutiny and the Federal division of powers.

The Commissioners of the Australian Law Reform Commission have included some of the most distinguished lawyers in our country. Sir Zelman Cowen and Sir Gerard Brennan were, at one stage, Commissioners. The Shadow Attorney-General, Senator Evans, and the Leader of the Opposition in Victoria, Mr. John Cain, were also Commissioners. Lawyers from every shade of opinion, from every part of the Commonwealth and from all branches of the profession, have been called to work on tasks of legal renewal.

Almost every one of those tasks has involved, directly or indirectly, the pressure for legal change caused by advances in science and technology. In recognition of this fact, from the very outset we have sought to attract to our table consultants from various scientific disciplines able to help us in the tasks of law reform. In a number of reports, a great deal of attention has been paid to mobilising scientific advances, to set at rest age-old disputes:

. In the Commission's report on Alcohol, Drugs and Driving prepared for this Territory, proposals were made for the use of the modern Breathalyzer which would print out the result of its analysis. The facility was advised for taking skin, blood and other body samples to recognise the limitation of the Breathalyzer, which is not specific to drugs other than alcohol. These proposals were adopted and are law.

. In our report on Criminal Investigation we sought to graft on to the police procedures, many of them virtually unchanged since Robert Peel laid them down in 1829 London, the new facilities of science and technology. To help lay at rest the disputes about the fair conduct of identity parades, we proposed photography of such parades. To help lay at rest the disputes about confessional evidence to police, we proposed tape recording, wherever practicable, of such confessions. To help maintain the independent judicial superintendence of intrusive police actions, we proposed telephone warrants for police in emergency cases. All of these proposals have been adopted and they form important aspects of the Criminal Investigation Bill 1981 which is presently before Federal Parliament. That Bill, embracing the advantages of science and technology for police procedures, represents one of the most important law reform measures every placed before Federal Parliament. I believe the Attorney-General, Senator Durack, is to be commended for pressing on with these reforms. The Commissioner of the Australian Federal Police, Sir Colin Woods, is also deserving of approbation for his willingness to embrace sound scientific reform. I have no doubt that tape recording, when police become used to it, will prove one of the most important weapons in the armoury of police in their fight against crime.

. In the current project of the Commission on the Law of Evidence, we are examining ways in which the rules of evidence applied in Federal courts can be tested against modern psychological research. Experiments show that uninterrupted testimony is much more reliable as a reproduction of accurate recall than testimony which is punctuated by questions. Experiments show conclusively that such questions can distort the reply. When a test group was shown a basketballer, and half were asked 'how tall is the basketballer' and half asked 'how short is the basketballer', the average difference in responses was as much as ten inches. Yet testimony in our courts is produced by techniques of rapid-fire questioning. Can a legal technique so ancient and fundamental be changed by the mere proof of scientists that the centuries-old ways lawyers have been doing things may contribute to positive distortion of recall?

THE PROBLEMS OF SCIENCE

Energy Sciences. If one were to identify the three principal areas of science in which great advances are occurring that will have implications for the law, one would mention the energy sciences, informatics and biological developments. The South Australian Law Reform Committee has looked at changes in the law that will be needed with any advance in the use of solar energy in Australia. They have examined such matters as the :

- rights of access to solar radiation
- building and planning implications
- consumer protection for solar energy appliances
- control of solar radiation

None of these matters has yet been committed to the Australian Law Reform Commission. One has only to think of the revolution in society and the law brought about by the motor car to consider the potential for legal change that will attend any major shift from fossil fuels. The OECD already publishes a regular journal simply titled 'Nuclear Law'. It is difficult to foresee the implications of changing energy sources for our legal system. If we go down the nuclear path some of our traditional civil liberties may have to be modified because of the need for greater security around nuclear establishments.

Informatics. The impact of the microchip is only now being felt in the legal profession. So far it has involved word processors, the beginnings of computer retrieval of legal data and greater office efficiency. However, I have no doubt that in time computerisation of land titles will greatly reduce the role which lawyers play in land conveyancing in Australia. As this presently represents 50% of the fee income of the legal profession of this country, the implications of this change for a widely distributed service profession must be carefully evaluated and, above all, prepared for.

In terms of the substantive law, a number of areas of operation will need reconsideration to adjust to the world of computications : computers married to telecommunications systems. I leave aside such matters as national security, the impact of worldwide computications on national languages and culture. If we just look at the changes in our laws that may be needed for the greater vulnerability of the wired society, for the greater protection of the privacy of individuals in respect of computerised personal information data banks and the need for modification of our courtroom rules for the introduction of computer-generated evidence, we can see that there is a major

task for reform ahead. The Australian Law Reform Commission has been devoting a good deal of its resources to the issue of privacy protection, in order to develop data protection and data security laws. With the enactment of the Freedom of Information Act 1982, last month, the Commission is now working at full steam to produce its report on privacy laws to complement the FOI Act. The other side of the coin of greater access to government information is the need for new protections against the capacity of computers to aggregate personal information and to provide instant, detailed data profiles to those with control of the computers.

Bio-ethics. The field of bio-ethics presents the most dramatic and in some ways the most difficult area where science promotes the need for law reform. The Law Reform Commission, by a collection of distinguished legal, scientific, philosophical and theological consultants, produced a report on Human Tissue Transplants. That report is now being adopted in most of the jurisdictions of Australia. It deals with such controversial implications of transplantation as:

- the definition of brain death
- the regime for donations or the substitution of a legal system of implied donation
- the question of donations by legal minors, under the age of 16, to siblings of non-regenerative tissues in the case of mortal need
- the use of organs and tissues from coroners' cadavers for the production of serum, in the name of a public interest wider than respect for the bodily integrity of the dead.

The success of the implementation of the Human Tissue Transplant report in several jurisdictions of Australia shows that progress can be made in law reform concerning bio-ethics, if the right techniques of expert and public consultation are carefully followed. The success of that project opens up the possibilities for law reform work in many associated areas of great sensitivity. These are neither hypothetical issues, nor are they likely conveniently to go away. They are specially uncomfortable for politicians in the lawmaking process because of the high emotions that they raise. Yet unless the democratic lawmaking system is to prove incompetent to handle such questions, we shall continue to have serious problems associated with bio-ethical questions posed for us by the onrush of the technologists. I refer to such issues as:

- the growing use of artificial insemination by donor (AID)
- the use of foetal tissue for experiments

- the issue of euthanasia and the right of terminal patients to elect to die without having 'extraordinary medical means' applied to their survival
- the predicament of doctors at the birth of a spina bifida child or a child born grossly mentally retarded. The recent jury trial of Dr. Leonard Arthur in England shows that this is far from an academic question.
- the advance of genetic engineering
- the development of artificial intelligence, including by the marriage of computing and biological sciences. We are now told that the next generation of space exploration probes is likely to rely almost exclusively on computerised and automated control systems based on artificial intelligence
- the development of children by the processes of in vitro fertilisation which has been pioneered in part by Professor Carl Wood and his team in Melbourne. Australians have not been in the forefront of working out the legal implications of this development. Should IVF be confined to married couples? Should freezing and retention of the human embryo be permitted? If so, should it be permitted for up to 400 years, as is said to be technically possible? What should happen on the death or divorce of the donor parents? Should surrogate parenthood be permitted and if so, with what rights and duties? What are the implications for the passing of property and for human identity? This is one area where our scientific capacity has, so far, completely outstripped our legal ingenuity.

CLONING : A LEGAL TIME BOMB?

In the remaining few minutes available to me, I propose to say something about a subject which has so far not attracted legal attention in Australia but which raises complex and sensitive legal and moral questions. I refer to the cloning of human beings. I raise it here, because it is my understanding that the Australian National University is in the forefront of world research about cloning of animals other than humans. I do not suggest that the research at the National University is being conducted into human cloning. But it does not require much imagination to realise that what can be done in the way of clonal, asexual reproduction of a prize bull or of a mouse could, technologically, before too long be adapted for cloning of men and women.

In fact, one of the most remarkable developments in biological research is the possibility of the elimination of sex from human reproduction. Even in artificial insemination and in vitro fertilisation, the genetic materials contributed by male and female are still necessary to reproduction. Cloning drastically alters this necessity. In sexual reproduction, male and female sex cells each containing only one set of chromosomes are joined together at fertilisation to form an embryo having a double set of chromosomes. Normal fertilisation, by combining genetic material from two different parents, always generates progeny uniquely different from either parent or from anyone else. Sexual reproduction involves a kind of genetic lottery. Clonal propagation is devoted to reproducing, by asexual means, the precise identical copy of a single parent.

The most common technique of cloning involves the removal of the nucleus of an unfertilised female ovum and its replacement by a nucleus from an adult body cell of the prospective parent. This renucleated egg is then placed in a uterus (or even an artificial womb) for gestation and normal development. Plants have been cloned in this way for centuries. A successful clonal frog has been reproduced.[1] I understand that, so far human cloning has been held up by the difficulty of perfecting techniques of nucleation because of the comparatively small sized human egg cell. A recent United States journal suggests that successful nuclear transplantation in man will be technologically possible within the next ten to twenty years. Indeed, under a crash programme, it suggests that human cloning could be accomplished virtually overnight.[2] In fact, it was reported in January 1979 that Dr. Landrum B. Shettles had transplanted a human nucleus. Apparently, the human egg recipient was enucleated with a micro pipette. Several operations were performed, three resulting in ova that formed small clusters of cells. Shettles suggested that normal development would have resulted had this product been inserted in the uterus of a human.[3]

Some might say : Who would bother producing a cloned human being : an exact replica of another person, by such a tedious and unexciting process as asexual reproduction? Such sceptics should read our recent human history, not least the way in which the distinguished German medical profession was diverted into Hitler's experimentation. It is but forty years since there was talk of a Master Race and experiments were conducted on live humans to test such things as human survival in extreme cold. Such cynics should also look around at the vanity of people already alive : the tendency to name children after parents and the feeling that would beat in at least a few breasts (possibly even in Canberra) that the chance of having a second version of oneself was too great an opportunity to pass up and to offer to posterity.

Quite apart from the moral and ethical issues that are raised by the prospect of human cloning, there are many legal questions that would have to be addressed:

- Should it be permitted at all, or should the law prohibit such developments, and even such experiments? To what extent should the law interfere in scientific experimentation, even of this kind?
- What would be the legal relationship between the clonist and the clonant? One commentator has said that they would be siblings — brothers or sisters — because the genes of the clonant would be identical to those of the clonist and hence they would share the same combination of genes which the male parent and female parent contributed to the clonist by normal sexual reproduction.[4]
- What is to happen if experimentation with human cloning ends with failure? In the frog cloning experiments, a number of grossly malformed unnatural creatures resulted which suggests that similar mishaps might occur, at least during the first human clonings.[5]
- Would the victim of a 'botched' human cloning have a cause of action in tort for 'wrongful life' : a new development that is occurring in the United States, especially where mentally retarded children are suing doctors who fail to advise their mothers on the need for ante-natal tests.

The Nobel Laureate, Dr. Joshua Lederberg, pleading for early regulation of human cloning, stated his views thus:

> What to do with the mishaps needs to be answered before we can undertake these risks in the fabrication of humans. ... Our genetic system is so complex that experiments in the surgical repair of the system are bound to fail a large part of the time, and possibly with disastrous consequences. ...[6]

Here we are, at the dawn of remarkable eugentic possibilities. Increased resistance to disease, improved intelligence, stamina and other laudable gaols will doubtless be put forward, as indeed they already have in some scientific circles, as a basis for adopting a mix of sexual and clonal reproduction would be used of humanity. Sexual reproduction for experimental purposes; clonal propagation to maintain the 'suitable type'. But as one United States commentator has said :

> The problem which arises ... is the difficulty of determining who will be chosen to clone and who will be chosen to engage in sexual reproduction. Without careful consideration by the law, this could easily result in the totalitarian abuses deeply feared by some commentators.[7]

The lesson of science and technology for the law is that its developments tend to happen very rapidly — sometimes overnight. One morning we wake up and the newspapers proclaim a 'test tube baby'. Smiling parents and doctors reassure us that all is well. So far, perhaps it is. Will we have the same reaction if one day, within the next 20 years, we wake up to read that the remarkable scientists have gone beyond cloning frogs, mice and prize cattle. Will the television pictures of the first cloned human being fill us with delight, fear, horror, awe? Without legal regulation it is sure that scientists somewhere will continue the experimentation. Meanwhile, the law and the lawmakers sleep on this subject. Suddenly, overnight, there will be a flurry of activity and a need for legal response. It may not be a considered response, unless we prepare.It is imperative that the response when offered should not be left to the scientists alone — nor to theologians or philosophers alone. As in all the questions of bio-ethics, and indeed all the issues of scientific impact on society, it is vital that the community be brought into the debate.

If there has been one thing unique in the work of the Australian Law Reform Commission, it has been its endeavour to raise community debate about its proposals. The ticking UXBs of science — particularly biological science which touches so closely the deepest human emotions — represent one of the best arguments I know for law reform. I say this not to be alarmist but out of recognition of the need to develop new interdisciplinary means of helping the lawmakers to cope with a time of rapid, puzzling scientific change. Whether it is through the Law Reform Commission, or some other national body, it is essential that our country — indeed humanity — develop means to bring together the relevant disciplines and to consult the community — so that even in our Age of Science and Technology the law and its institutions can uphold the rules that reflect the values of ordinary men and women.

FOOTNOTES

1. J. Gurdon, 'Transplanted Nuclei and Cell Differentiation', 219 Scientific American, 24 (1968).

2. P.D. Turner, 'Love's Labor Lost : Legal and Ethical Implications in Artificial Human Procreation', 58 Uni.Detroit J.Urban L. 459, 482 (1981).

3. L.B. Shettles, 'Diploid Nuclear Replacement in Mature Human Ova With Cleavage', 133 J.Obstaetrics and Gynecology' 222 (1979). Note that Shettles' prediction has been criticised, R. McKinnell, 'Cloning — A Biologist Reports', 1979.

4. McKinnell, 106.

5. P. Ramsey, 'Fabricated Man : The Ethics of Genetic Control', (1970) 75-77. It was hypothesised that the frog monstrosities were due to the timing of the egg renucleation at the moment the body cell nucleus was being inserted.

6. J. Lederberg, 'Experimental Genetics and Human Evolution', 22 Bull.Atom Scien., 4, 12 (1966).

7. Kindregran, 'State Power Over Human Fertility', 23 Hastings LJ 1401, 1416 (1972). Cf. J. Fletcher, 'Ethical Aspects of Genetic Controls : Designated Genetic Changes in Man', 285 New Eng.J.Med 776, 1971.