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THURSDAY, 22 OCTOBER 1981

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May 1982

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THE GEELONG LECTURES AND ALFRED DEAKIN

It is an honour to be asked to give a lecture in the Geelong Lecture Series. This is my first visit to Deakin University and to Geelong. But I have been associated with your Vice-Chancellor in an important enterprise concerning technology assessment. Like many thousands of other Australians, I have been listening to Professor Max Charlesworth's informative, stimulating radio broadcasts of recent days, dealing with the history of science : using science to bring its history to an unprecedented audience.

This University bears the name of one of the Founding Fathers of the Australian Federation, whose life and contribution to the reform of the law I explored once in a memorial lecture which honours his name.[1] Without a doubt the name of the University was chosen most wisely. Of all the lawyers in the Australian Constitutional Conventions (and there were many lawyers), Deakin was the most steady in his devotion to the national ideal, resolute in his adherence to important principles and warm and human in his personal relations. These characteristics of national service, devotion to principle and concern for human values, do well as the guiding stars for a modern university.

I have sat on the Senate of Australia's oldest university in Sydney and now I serve in one of the youngest in Newcastle. In unusually difficult times, our universities carry on the traditions of education and research. The new universities are perhaps better equipped and more inclined to face new problems. I applaud the initiative of Deakin University, named after a great Australian lawyer and lawmaker, to devote the 1981 Geelong Lecture to the subject of the law and modern technology. I express appreciation of the honour of being invited to deliver this lecture. Most warmly, I commend this University for its concern to raise the public debate in Australia about the implications for our society of the imperative of technological change.

PUTTING IT IN CONTEXT

I have been invited to deliver this lecture because I am Chairman of the Australian Law Reform Commission. The Commission is a Federal body established by the Australian Parliament with the support of all political parties to review, modernise and simplify Federal laws. There are State law reform bodies. In Victoria, there are three: the Law Reform Commissioner (Sir John Minogue), the Statute Law Revision Committee (headed by Mr. Aurel Smith M.P.) and a part-time committee known as the Chief Justice's Law Reform Committee. There are law reform bodies in every other State of Australia. Most countries of the world which have a legal system that can be traced to the common law of England have now set up law reform bodies to help their respective legislatures to update and simplify the laws.

Inevitably, the law tends to speak to each generation in the language, and reflect the values, of an earlier generation. The law is overwhelmingly a conservatising force. Lawyers tend themselves to be cautious and conservative by disposition and inclination.

Great forces are at work in our society today which necessitate reform and modernisation of the legal system. Among the relevant changes that are occurring are three which can be readily identified:

- First, the increasing power of government, its agencies and officials, to make decisions affecting all of us.

- Secondly, the increasing influence of the modern business corporation, adopting new methods of operations that render laws developed in earlier times inadequate or irrelevant.

- Thirdly, the impact of changing social values and moral perceptions. The business you are in, education, is inevitably playing its part in developing a community that is better informed, more questioning and more inclined to reject old values and former ways of doing things.

Each of these important changes comes upon a society, with a legal base developed for earlier times, to meet the problems of earlier generations. Yet none of the forces which I have so far identified has anything like the impact on society as the changes brought about by modern science and technology promise to do. Science and technology constitute the most dynamic force for legal change which is at work in our country today. Technological change waits for no lawyer and no lawmaker. Technological changes occur, often without warning. They tend to outstrip the ability and inclination of the lawmaker to adjust. Indeed, they cast doubt on the capacity of our institutions to meet the contemporary pressures for change.

Law reform bodies have been established to help meet this institutional problem. They are among the institutions of lawmaking of the modern state. They do not themselves make laws. They propose new laws to the executive government and to the parliaments to which they report.

Almost every one of the references received by the Australian Law Reform Commission reflects, in one way or another, the growing importance of science and technology in the lives of all of us, and in the life of the law. Before, however, I deal with the effects of technological change and illustrate them from the reports of the Law Reform Commission and of other Australian law reform bodies, let me say a few words about the Australian Law Reform Commission itself.

THE AUSTRALIAN LAW REFORM COMMISSION

The Commission is established to advise the Federal Attorney-General and Parliament on the reform, modernisation and simplification of Federal laws in Australia. There are 11 Commissioners, four of whom are full-time. One of my predecessors in this series, Sir Zelman Cowen, has long interested himself in the relationship between law and technology. Until his appointment as Governor-General was announced, Sir Zelman was a part-time law commissioner. In the early days of the Commission it also had the participation of Sir Gerard Brennan who, earlier this year, was appointed to be a Justice of the High Court of Australia. Mr. Justice Brennan has written specifically about the law, ethics and medicine.[2] Another former member of the Commission is Mr. John Cain, now Leader of the Opposition in Victoria. Current members include judges (Federal and State), barristers, solicitors and law teachers. The Commission is a body of lawyers, from different branches of the legal profession and different parts of the country, working on tasks assigned to it by the Federal Attorney-General. Its rationale is the improvement of our federal legal system.

The Commission prepares reports, many of which have been picked up and implemented both at a Federal and State level. Before doing so, however, it engages in a debate with the expert and lay community about the defects in the current law and the ways in which those defects can be cured.

The Commission represents a modest investment in law improvement. In addition to the Commissioners, there is a staff of 19. We endeavour to supplement our staff and to infuse the perspectives of non-lawyers by the appointment of consultants, usually on an honorary basis. Many of our consultants have come from disciplines quite outside the law: psychologists, expert surgeons, computer scientists, media personnel, experts in drug rehabilitation, moral philosophers and theologians and so on.

The range of subject matters upon which the Commission has been asked to report, or is at present working, is wide. It includes complaints against the police, the reform of criminal investigation procedures, the law relating to alcohol, drugs and driving, reform of debt recovery procedures and insolvency law, the law relating to human tissue transplantation, the law on defamation and privacy, the law governing the compulsory acquisition of property by the Commonwealth, laws on sentencing, laws on insurance, laws relating to class actions and standing to sue in the courts, child welfare law reform and the latest task on the comprehensive reform of the law of evidence. In many ways our most difficult task is that which raises the question of whether Aboriginal customary laws should be recognised in some way by our legal system. This is a difficult issue for it raises the issue of the whole rationale and purpose of the legal system and ways in which social order can be maintained in a diverse and multicultural community.

Of the many dazzling advances of science and technology in our time, three stand out and each has relevance for the laws of our country. I refer to the energy sciences, the information sciences and the biological sciences.

LAW REFORM AND ENERGY TECHNOLOGY

No task yet assigned to the Australian Law Reform Commission has been specific to the impact on the law of one of the most pressing of contemporary problems: the energy crisis. Yet one law reform body in Australia has already addressed this problem. There is no doubt that energy law, and specifically nuclear law, will be a growing issue for lawyers and law reformers of the future.

The depletion of the world's fossil fuels and the controversies surrounding alternative sources of mankind's energy needs caught the attention of law reformers in Australia when a sub-committee of the Law Reform Committee of South Australia (S.A.L.R.C.), known as the Committee on Law and Solar Energy, was set up by the Government of that State in September 1976. The sub-committee issued a discussion paper titled Solar Energy and the Law in South Australia.[3] The paper addresses the legal problems facing and likely to face the 'potential increase in the use of solar energy'. The Chairman of the S.A.L.R.C., Mr. Justice Zelling, led the committee which comprised Mr. D. Bollen Q.C., an officer of the Department of Mines and Energy, the Dean of Engineering in the University of Adelaide and a Senior Lecturer in Physics at Flinders University. Consultants have been appointed with scientific skills. The Committee was a truly inter-disciplinary exercise, as many law reform tasks in Australia inevitably become.

The terms of reference on solar energy required the S.A.L.R.C. to consider:

- legal problems facing the increased use of solar energy;
- rights of access to solar radiation;
- building and planning implications;
- consumer protection for energy appliances;
- control of solar radiation.

The committee issued 22 tentative conclusions. Amongst these was an opinion that the direct use of the sun could contribute up to 12% of Australia's energy requirements by the year 2000. This could include 70% of energy requirements for water heating and 50-80% of household energy. Various suggestions were made for building design, removal of government taxes on solar equipment and encouragement of research on applications of solar energy. The establishment of an Energy Advisory Service to assist consumers, builders and architects was proposed. Present public authorities (electricity and gas) were urged to play an important part in encouraging the alternative use of solar energy by appropriate tariff structures.

The adaptation of the law of easements to ensure a right of access to the sun was proposed. Although it is relatively simple to define the scope of the unimpeded access necessary to use solar collectors effectively, it is not so simple, according to the committee, to suggest how an individual's right to such access could be implemented.

In addition to various comments on planning law, building codes and the like, the S.A.L.R.C. called attention to the need for better funding of research and development of solar energy in Australia. It stressed that the present expenditure by the Commonwealth Government for solar energy research and development was low when compared with expenditure overseas. The need for government incentives and for co-ordination between Federal and State efforts within Australia to encourage solar energy and energy conservation was declared to be 'essential'.

Commenting on United States sun laws, the committee concluded:

> The intense American interest in legislation to facilitate the use of solar energy, which has excited a similar interest here, may be misleading. Much of the legislation in the United States is in the nature of appropriation or funding bills, or in the form of general statements of intention, which would be expressed administratively, rather than in legislation, in this country. The New Mexico Act dealing with sun rights ... would for instance be regarded as too vague for legislative implementation here. This is not to say that American actions have no relevance to Australia, and for this reason, they are still examined by the committee even if they are precedents for actions [rather] than legislation here.[4]

This discussion paper was a striking first for the S.A.L.R.C. and for law reform in Australia. It is an indication of the new fields which law reform in Australia must pioneer. The old days of purely technical, policy-free law reform seem to have gone. The impact of technology on the law and on society, with multiple policy implications, requires much more of law reform today.

LAW REFORM AND INFORMATION TECHNOLOGY

The second technology which I have identified as having a profound effect on our society and its laws is the new information technology. Any layman can observe the rapid penetration of Australian society by the computer, the word processor and 'computications': computers linked by telecommunications. It has been estimated that in Australia computers are already part of an industry with an annual turnover of 1,500 million per year. Over 11,000 computers are said to be in use in this country. The Myers Committee of Inquiry into Technological Change demonstrated a rapid absorption of computer technology in Australia. We can see it at airports, in supermarkets, at banks, indeed everywhere.

A number of implications are posed for our society and its laws. These have been identified in many overseas reports.[5] They have been repeatedly stressed in international conferences: for the technology is international and the problems are virtually universal, at least in the western countries which, like Australia, are absorbing computer and information technology. Amongst the problems that have been identified are the effect of the new technology on employment, its impact on national security and defence, its results on the national language and culture, the greater vulnerability of the computerised society and its impact on individual liberties, including privacy.

One of the tasks of the Australian Law Reform Commission requires it to look at the impact of computerisation of personal data for privacy. Of course, damaging personal data can be kept in a pencilled notebook. However, there are well established features of the computer which create new dangers. These features have been identified in many reports. They include:

- The amount of data that can be stored.
- The speed with which the data may be retrieved.
- The ever diminishing cost of storage and retrieval, making it feasible to retain data that would in earlier times have been lost or supervened by sheer bulk and expense.
- The linkages that can be created to establish a 'data profile' from many sources of information, perhaps supplied for other purposes.
- The establishment of a new occupational group, the 'computerists' without the old training, ethics and discipline even of the established profession.
- The fact that the new technology is not generally accessible to ordinary citizens.
- The tendency of the new technology towards centralisation of control.
- The international dimensions: the rapid growth of overseas data bases storing personal information upon all of us for airline, credit, banking, insurance and other purposes.

To deal with these issues the Law Reform Commission has proposed legal reforms, outlined in two discussion papers, the second of which deals specifically with Privacy and Personal Information. This paper proposes new laws for the protection of privacy, the creation of new protective bodies, including a Federal Privacy Commissioner, and the creation of new rules on data protection and data security enforceable through the Commissioner and, in some cases, in the courts. The report on privacy may be expected early in 1982 with proposals for Federal privacy legislation.

There are many other implications for the new information technology and the law. Computer crime is one of the most obvious. It will require redefinition of the law of 'theft' in many of the jurisdictions of Australia. In the United States, it has been held that theft of information itself or even of a computer programme is not 'theft' for legal purposes. Those purposes normally imply the carrying away of goods. This illustration is simply an instance of the way in which the letter of the law is overtaken by new technology. Nowadays it is the message rather than the medium that is valuable. In times gone by, it was adequate for the law to protect the medium.

The latest reference to the Law Reform Commission requires reform of the law of evidence. One of the most important reasons for the giving of that reference was the growing impact of computerisation on the keeping of records. Normal rules against admission of hearsay evidence would require the calling before the court of the original maker of a record and a close tracing of every step thereafter to the final 'printout'. Yet the very development of computers postulates the input of many hands. Indeed that may be a prime purpose. It may simply be impossible to trace those who programmed, supplied and generated the data in the computer. On the one hand, the law and its officers must not fall into the trap of accepting data as true simply because it is generated by a remarkable new technology. On the other hand, the courts must not become the only decision-makers in society which reject computer and computer-generated evidence. Otherwise, decisions will be made in the courts which bear no relationship to the decisions of reasonable men in society. Balancing the rights of the individual and the need to utilise and accept the new technology poses important quandaries for the Law Reform Commission in its evidence reference.[6]

LAW REFORM AND BIOLOGICAL TECHNOLOGY

Even more puzzling and difficult for the law are the problems presented to the law reformer by the remarkable advances of new biological sciences. There are many problems here and most of them catch our society and its lawmakers unprepared for the difficult moral questions that are posed. The intractable nature of these issues is admitted every time a speaker turns his attention to them. In 1978 Sir Roger Ormrod, a Lord Justice of Appeal of England, and himself a trained physician, delivered his paper, 'A Lawyer Looks at Medical Ethics'. He suggested that part of the problem of resolving the profoundly difficult moral questions that arise in ever-increasing number out of advances in medical technology was the fact that 'there have been marked and widespread changes in moral attitudes':

> The questioning of accepted knowledge has extended to the questioning of moral attitudes, that is, of course, in the Western world, the moral teachings of Christianity. ... This means that the support of a form of authority, the accepted moral code, has largely gone, with the consequence that we are now faced repeatedly with choices which have to be made by each one of us on each occasion for ourselves, where before little or no question of choosing would arise'.[7]

His Lordship cautioned that this obligation of choice should not necessarily be regarded as a 'regression':

> However disturbing and difficult the consequences may be, the ability to choose imposes immense responsiblities, but it represents one of the greatest achievements of humanity.[8]

No issue of this kind has attracted so much public attention as the question of the law relating to abortion. Laws and practices differ profoundly. For example, the West German Federal Constitutional Court has declared that abortion is an act of killing. It could not, so the Court said, be camouflaged by 'the description now common, "interruption of pregnancy"'.[9] On the other hand, in 1973, the United States Supreme Court laid down a detailed regime to govern the basic rights of the pregnant woman under the United States Constitution. As to the asserted right of the foetus to life, the Supreme Court observed:

> We need not resolve the difficult question of when life begins. When those trained in the respective disciplines of medicine, philosophy and theology are unable to arrive at a consensus, the judiciary, at this point in the development of man's knowledge, is not in a position to speculate as to the answer.[10]

The counterpart to the 'right to life' is the group in society who would urge the 'right to die'. Voluntary euthanasia has lately become a controversial matter in Britain. Indirectly, the issue has been raised in Australia by the introduction to both the South Australian and Victorian parliaments of Bills aimed to

> enable persons to make declarations of their desire not to be subjected to extraordinary measures designed artificially to prolong life in the event of a terminal illness.

Associated with the issues of life and death are the problems posed by the in vitro fertilisation program pioneered at the Queen Victoria Medical Centre in Melbourne. I have recently addressed[11] the legal issues that are raised by the work of Professor Wood and his colleagues. No-one is more keenly aware of the ethical and social implications of the program than Professor Wood himself. I will not repeat what I have previously said on this score. Suffice it to say that even those who do not accept the absolute papal embargo on in vitro fertilisation[12] or who regard the spectre of Aldous Huxley's 'human hatcheries' as far-fetched or greatly premature[13] or regard the debate about public funding of the program as a mere matter of detail[14], there remain for the lawyer many complex and difficult questions which will have to be considered by someone before too long. Is the procedure to be available to de facto couples? Are surrogate mothers to be permitted and if so, with what legal rights, including over the abortion of the child? What is to happen to the embryos, frozen and suspended in nitrogen, surplus to use? Who has a right of possession of such embryos? What effect will divorce have upon retention of such an embryo? What are the consequences for the passing of property of the new technique, if a child of our generation is born a century hence? Is gender choice to be permitted? Do we contemplate a world in which a ready-made embryo, produced by a desirable mother and a Nobel scientist, can be sold or otherwise made available to persons who want the prospect of gifted children?[15] No official body is currently looking at these problems, in consultation with all interested disciplines and the community. The problems present suddenly and in dazzling complexity. The institutions of lawmaking find it difficult to cope.

One project of the Australian Law Reform Commission required us to face squarely some of the implications of biological advances. I refer to the work of the Commission on human tissue transplantation.[16] The Commission's report had to grapple with a number of the very difficult issues which are presented when medical science overcomes the normal tendency of the human body to reject transplantation of organs and tissues of another. The Commission had to deal, for instance, with the problem of the definition of 'death' for legal purposes. The common law approached this definition from the viewpoint of common sense. Although the laws of Australia and Britain have never attempted to define 'death' with precision and had left its diagnosis to the medical profession, it is generally accepted that the classical criteria for determining death were the cessation of respiration and circulation of the blood. Interpose an artificial ventilator in a modern hospital and these criteria become not only irrelevant but potentially mischievous. In the English case, R. v. Potter,[17] a man stopped breathing 14 hours after having been admitted to hospital with head injuries sustained in a fight with the accused.

He was connected to an artificial respirator for 24 hours, after which time a kidney was removed and transplanted. The respirator was thereafter disconnected and there was no spontaneous breathing and heartbeat. At the coroner's inquest, the question arose whether the accused had caused the victim's death. Medical evidence showed that the patient had no hope of recovery from the brain injury. The coroner's jury found that the removal of the kidney had not caused the patient's death. It returned a verdict of manslaughter against the assailant. He was then committed for trial but was later found guilty only of common assault. The unsatisfactory features of this case have left many lawyers with the conviction that the common law should be clarified to make it plain that death may be determined by reference to irreversible loss of function of the brain. The Law Reform Commission proposed this in its report. Its proposals, in this respect, have been accepted in law in the Australian Capital Territory, Queensland and most recently the Northern Territory.[18] I understand that legislation, based on the report, may be expected in the current session of the Victorian Parliament and shortly in New South Wales. It is under consideration in the other States.

More contentious was the question whether a regime should be adopted by which all persons are to be taken as donors of organs and tissues for transplant purposes or whether a requirement of specific donations should be retained as a security against premature operations and to uphold the integrity of the individual and his control over his physical body.

Upon one matter within the Commission there was a division of opinion. It related to whether it should ever be permissible for non-regenerative tissues to be removed from living minors for transplant use. It was agreed within the Commission that the normal rule should be that in the case of non-regenerative tissues, removal from or donation by a living person below the age of 18 years should be prohibited by law. Two members of the Commission (Sir Zelman Cowen and Mr. Justice Brennan) would allow no exception to this rule, believing that the existence of an exception would impose unacceptable pressures upon siblings or other relatives which would be avoided if the law, defending minors, prohibited donation in every case. The majority of the Commission took the view that subject to pre-conditions relating to independent advice and scrutiny by an inter-disciplinary committee headed by a judge, the family should be allowed to solve this crisis, without absolutist prohibitions of the law.[19] The case illustrates the fact that as in all matters of law reform, but especially perhaps where medical science is involved, men and women of goodwill can have all the relevant information and expertise, yet can differ fundamentally upon what the reformed law should provide.

The report of the Law Reform Commission was praised in the British Medical Journal, not frequently given to commenting on Australian legal developments. It declared the report to be 'the latest of an outstanding series':

> The publicity which the Commission's activities attracted in the course of preparing and publishing the report did a lot in Australia to remedy the ignorance of the public and the apathy of the medical profession towards this important subject.[20]

I do not say that all of the problems of medical morality and all of the highly contentious issues raised by developments in the biological sciences are susceptible to easy law reform treatment. But what is the alternative? The alternative is that technology will continue to take us where it will. Man's opportunity to say 'halt' or even 'pause' will be lost. Man's opportunity to determine the limits within which biological technology takes place will be abandoned or will be spoken with a muted voice. Above all, our opportunity, as a society, to lay down the legal regime within which technological advances will occur, and to provide for the consequences of those advances, will be completely lost unless we squarely face the moral, professional and legal consequences of the changes that are taking place. It is in this respect that the Law Reform Commission, with its procedures for interdisciplinary consultation, public hearings, discussion on the media and widespread community involvement, provides legislators with a well fashioned instrument by which to tackle the 'too hard basket' of legal change. The alternative is that our legal institutions will become more and more irrelevant to the social and ethical problems presented by advancing technology.

LAW REFORM AND GENETIC ENGINEERING

Before I pass from the legal implications of developments in biological sciences, I should like to say something about the law and genetic engineering. I am encouraged to do so by two events of the past week. The first is the announcement on Monday last by the Federal Minister for Science and Technology, Mr. David Thomson, of the establishment of a committee within his department to act 'as a genetic watchdog' in respect of Australian developments involving recombinant-DNA. This is an important advance which indicates Ministerial and departmental sensitivity to the implications of genetic engineering for society. Since 1975 a voluntary monitoring system has been in operation in Australia. Surveillance of 'all experimental work involving recombinant-DNA molecules in Australia' has been exercised by a committee of the Australian Academy of Science.[22] The work of this committee will now, presumably, pass to the Ministerial committee set up on Monday.

The second event was the arrival in Australia of an advance copy of an article published in the prestigious English law journal, the Modern Law Review. This article purports to give a 'Legal Perspective to the Control of the Technology of Genetic Engineering'.[23] It traces the concern that has been expressed about the effectiveness of non-mandatory guidelines for the control of newly developed genetic techniques. It urges the introduction in Britain of a new more rigorous legal regime designed to provide a system of licensing of corporations engaged in genetic manipulation, a compulsory safety committee for the protection of employees exposed to such processes, and new emergency statutory powers to permit intervention 'if a dangerous situation manifested itself in the community or was discovered in the course of an inspection'.[24] New criminal penalties to cover 'institutes, researchers, technicians and corporations' which recklessly ignored or wilfully breached the legislative controls over genetic manipulation'[25] are also proposed.

Most people in Australian society know nothing at all about genetic engineering. The expression has been taken to refer to a group of techniques used in laboratories to alter the hereditary apparatus of a living cell. This interference with aspects of the cell's genetic make-up can produce more or different chemicals or can result in the cells performing completely new functions. Cells altered in this way can be used for industrial production and for research.

Genetic engineering of one kind or another has been going on for centuries in a primitive way. Malting processes, for example, can involve genetic changes. But it is only in our time that these changes have been harnessed for large-scale, industrial activities. Nowadays, a number of chemicals can be produced by procedures of genetic engineering. They include biologicals (such as insulin), antibiotics, vaccine, vitamins, agricultural chemicals and industrial feedstock chemicals (such as acetic acid). Very great profits can be expected as a result of the industrial application of genetic engineering technology.

The term 'recombinant-DNA technique' refers to a relatively new and very powerful form of genetic engineering in which additional or substitute foreign coding material is introduced to an organisms, genetic program, in order to enable the cell to perform a highly specific function such as the production of some of the chemicals mentioned above. Even greater profits stand to be made from the 'commercial scaling up' of genetic engineering techniques.[26] These profits doubtless reflect the great utility to society which has already been established by such scientific manipulation of the most basic forms of life. One Australian commentator accompanied the foreshadowed announcement of the new Ministerial committee with this prognosis:

> Initially it will have the difficult task of framing guidelines acceptable to both industry and Government as well as agricultural, pharmaceutical and other research groups, such as the CSIRO. A problem is that the guidelines which aim to provide safeguards for the scale-up of the techniques, will be voluntary — so it is imperative they are acceptable to industry. ... This will probably involve industry being asked to declare that it is using the techniques and to give the committee sufficient details of the work to enable it to assess potential hazards and decide whether it is safe to scale-up and decide whether it is safe to scale-up to a commercial level. Similar voluntary codes exist in a number of overseas countries, and the Government hopes it will be unnecessary to introduce specific legislation that would probably hamper the speedy development of a genetic engineering industry in Australia.[27]

In judging whether legal regulation, beyond voluntary guidelines, is necessary, it is usual for a society such as ours to look at the costs of regulation, the potential benefits of what is being done and the possibility of damage or even catastrophe from the technique being used. In genetic engineering, as in other activities of life, things can go wrong. The common law — that body of judge-made principles which we have inherited from England and developed ourselves — is not always adequate to cope with scientific problems of this kind. This point can be illustrated by a case that arose in England in 1966. A disease research institute imported a virus from Africa. Cattle in the vicinity became infected with foot and mouth disease. Two local markets were closed by the Minister of Agriculture. Quite apart from destruction of the farmers' stock, two firms of auctioneers were unable to conduct their business whilst the market was closed. Their loss was financial only. The auctioneers brought an action in the courts against the institute, claiming damages. The court decision turned on the question whether the institute owed a duty of care to the auctioneers. Were they within the class that might foreseeably be injured by a failure to take care? The court held they were not, believing that such a duty was owed by the institute to the owners of the cattle in the neighbourhood but not to the auctioneers. Their loss was therefore not compensable.[28]

In 1973 there was an accidental release of smallpox virus from a laboratory in London. The virus was carried by one of the researchers at the laboratory and resulted in two deaths before the outbreak was contained. A public inquiry resulted in a full report to the English Parliament.[29] This report led on to other inquiries in Britain and later to the establishment of a Central Genetic Manipulation Advisory Group and the passage of the Health and Safety (Genetic Manipulation) Regulation promulgated under the Health and Safety at Work Act.

The concern about the effect of exposure to genetic manipulation on employees was reinforced by an incident at the Government Research Laboratory at Porton Down in Great Britain. A researcher at this facility was infected with a viral haemorrhagic fever as a result of the accidental penetration of protective gloves. At Fort Detrick in the United States, there have been recorded 423 accidental infections and three deaths over a period of 25 years : an average of one accident every three to four weeks.[30]

Quite apart from the concern about individual employees exposed to genetic manipulation, concern has been expressed more recently about the danger to a wider community of the catastrophic escape of micro-organisms produced by genetic manipulation techniques. The New South Wales Attorney-General, Mr. Frank Walker, was reported in August of this year to have urged the need for co-ordinated action by the Standing Committee of Attorneys-General to ensure close scrutiny of gene manipulation. Mr. Walker is reported to have suggested that a system should be introduced which ensured the approval of proper safety standards of containment at research premises and the inspection and supervision by a government authority during the course of that research:

> On the scientific advice available to me, I think it is an exaggeration to say investigations have shown the technology to be safe. It is important we realise that huge profits are to be made through investment in genetic engineering. It is equally impossible to see the variety of uses to which genetically-manipulated material might be put. I seriously doubt the capacity of scientists alone to regulate this advanced new field of research in the community interest without outside help.[31]

To illustrate his point, Mr. Walker took a 'hypothetical' example of a newly developed life form escaping from a laboratory and destroying the entire wheat crop of Eastern Australia:

> Obviously this would be a national disaster of the first magnitude, but in addition it would be a legal disaster for the institution or persons involved, since they would almost certainly be liable for the resulting damages.[32]

The English case which I have cited may indicate that not everyone damaged in this way could recover in the present state of the law. The magnitude of the damage contemplated by Mr. Walker could be beyond the resources even of a large chemical corporation.

The New South Wales Attorney-General's statement was criticised by a letter signed by Professor G.L. Ada, Chairman of the Australian Academy of Science Committee and now a member of the Ministerial committee. He claimed to be 'astonished':

> Fears that the entire wheat crop of Eastern Australia could be destroyed are unfounded. In fact, quite the opposite is confidently expected. Genetic engineering is a powerful new tool for plant improvement and will help plant breeders meet the onslaughts of tests and diseases.[33]

Hot on the trail of Professor Ada's reassuring words now comes the following comment in the English law journal to which I have referred:

> Speculation about the dangers of genetic engineering will no doubt continue as research progresses, but an accident which has already occurred in New Zealand serves to illustrate that such speculation is an inadequate substitute for the introduction of mandatory safety precautions. The incidence arose out of an experiment that was designed to improve the nitrogen-fixing capacity of a fungus which is commonly found on the roots of pine trees. A genetically engineered strain of the fungus was introduced to pine seedlings at a governmental research station and within a few weeks all the seedlings which were associated with the modified fungus has died. ... The risks that are involved are particularly acute in the private sector where companies are competing for patents in respect of new products and processes that are derived from the technology of genetic engineering. These companies are manufacturing and using genetically engineered organisms under circumstances which reduce the likelihood of adherence to restraints that lack the force of law. For example the [United States National Institutes of Health] guidelines warn against experiments which involve more than ten litres of culture. Such experiments are, however, of extreme importance in the industrial context.[34]

One of the difficulties of relying on voluntary guidelines or monitoring bodies which have no sanction of law to enforce socially acceptable standards is that breach of the guidelines may be more readily contemplated by enthusiastic scientists carried away by their research. Under the heading 'Genetic engineer who brokes the rules is punished — a little', a recent issue of the New Scientist tells the tale of Dr. Martin Clyne, an oncologist at the University of California, who last year injected bone marrow carrying genetically-engineered DNA into two patients suffering from a fatal genetic disease. Dr. Clyne was

reprimanded for experimenting without first getting permission. He acknowledged that he had exercised 'poor judgment' in failing to halt the studies and seek appropriate approval. The NIH has been criticised for being 'too lenient' with Clyne, though he is to be monitored for future research funds from the Federal Government.[35]

Many questions are posed for society by the scientific harnessing of genetic manipulation. Of these, I would isolate three of specific relevance to the law. The first is the identification of the point at which the potential of catastrophic damage (however small the risk) warrants the community taking preventive action of a mandatory and not simply a voluntary kind. Licensing, an inspectorate and the paraphernalia of State supervision of scientific research and activity have many disadvantages. They are expensive to establish and maintain. They tend to be slow and cautious in decision-making. Often they are ineffective. Moreover, where new industrial techniques are concerned, there is a need to ensure complete confidentiality to business secrets.[36]

On the other hand, the adoption of voluntary guidelines and the establishment of monitoring bodies in Australia and overseas does appear to acknowledge that there are risks of a certain order.[37] The profit motive and market forces, however socially useful in normal circumstances, may need to be reinforced as the risk to society increases. Though the instances of accidents and mistakes in the course of genetic engineering so far are relatively few, they are sufficiently worrying in kind, if not in number, to indicate that this is a potential social problem of great complexity and importance. The self-same profit motive may, without mandatory requirements enforced by the law, sometimes tempt smaller operators in particular (or the enthusiastic Dr. Clynes of this world) to 'go it alone' for fear of disclosure of their secrets to competitors or the irritating dull hand of bureaucracy insisting on a pause to reflect.

My second point is slightly different. The Australian Federal Parliament does not have, under the Australian Constitution, full constitutional powers to legally regulate, in whatever way, genetic engineering and recombinant-DNA technology. This is another case of science overtaking the imagination and experience of our Founding Fathers. A national approach to regulation of this technology seems sensible in view of the danger that protective rules may be lowered in one jurisdiction to attract business investment yet the risk, if things went wrong, could conceivably extend far beyond a single State or Territory. The history of the achievement of uniform laws in Australia is a sobering one. It has taken more than 12 years to negotiate uniform credit laws; and the uniform legislation has still not been enacted in a single State.

The moral appears to be that if national legal regulation of whatever kind is envisaged on genetic engineering, the sooner the necessary institutions are set in place the better, and the sooner a start is made to consider what may be necessary in the long run, the greater will be the chance that we can keep the technology within our legal sights.

My third point is perhaps the most urgent. A scrutiny of the Ministerial committee announced this week discloses, without exception, the distinguished scientific and industrial background of the members of the committee. They include leading genetic researchers, academics and businessmen. A committee without a full spectrum of relevant voices may deprive the Minister and the Government of the range of community opinion necessary on topics such as this. Just as war is too important to be left to the generals and law and law reform too vital to be left with the lawyers alone, so, I believe, the future problems of genetic engineering are too intricate and sensitive to be left to scientists and businessman alone, however dedicated and intelligent. It would be my hope that in due course the membership of the committee may be expanded to include those who can represent a completely disinterested community viewpoint. Such a committee could alert the scientists to problems which they do not perhaps perceive or, though they perceive them, may sometimes be inclined to dismiss too lightly. Certainly lawyers should be associated with the committee especially if it turns to genetic engineering involving the human species. Research on genetic manipulation involving higher life forms, including the cloning of mammals and the correction of genetic defects in mammals (including humans) raise very serious moral and legal dilemmas. It is my opinion that it would be positively dangerous both to the committee and to the lawmaking process in general for such issues to be turned over to bodies predominantly scientists and businessmen. Nothing less than a thorough and disinterested presentation of these issues to the community and to its political representatives will be satisfactory if we are to preserve the rule of law in the face of even such dramatic and potentially beneficial developments as genetic engineering and recombinant DNA technology.

THE LAW USING TECHNOLOGY

So far, I have talked only of the problems presented to society and the law by science and technology. But my thesis is not only that we must be alert to the forces for change and the need to adjust the law to cope with change. We must also encourage the best possible use in the law itself of the new technological advances. Lawyers tend to be frightened off by technology. They tend to have come up the education stream with skills in verbal dexterity, historical knowledge and poetic inclinations.

Yet it is important that the law and its practitioners should be receptive to technological change and should not only address its consequences for the substantive law but should also embrace the new technology and put it to the best possible use of society in the law.

Take first two cases in which technological developments have come to the aid of the legal process. The shocking toll of the road is a universal phenomenon of the post-automobile society. To natural and inevitable perils are added the special dangers which result from the conduct of intoxicated drivers, affected by alcohol or other drugs. It is not so very long since prosecution evidence, in cases involving drivers charged with driving whilst affected by alcohol, was confined exclusively to impressionistic evidence. Lengthy examination and cross-examination was required to test this evidence. Many of the disputes which revolve around impressionistic evidence of this kind were laid at rest by the introduction of blood alcohol analysis and breath analysis. How would we have coped, even as inadequately as we do, with the tremendous social problem of intoxicated driving, had it not been for the advent of breath analysis equipment? The Law Reform Commission was asked to report upon a number of defects which had become evident in the relevant law of the Australian Capital Territory. Its report Alcohol, Drugs and Driving led to the enactment of a law, substantially adopting the great bulk of the Commission's recommendations. As in all of its tasks, the Commission had a panel of appropriate experts from, in this case, various branches of relevant scientific endeavour. We also had the closest support and assistance from officers of the Australian police forces, Federal and State. It concluded that the primary method of ascertaining the presence of alcohol in the body of a suspected person should be breath analysis, conducted by means of an instrument approved for that purpose. It urged, in particular, the use of the Model 1 000 Breathalyser, with its facility to print out the results of tests conducted by it. Attention was called to other breath analysing instruments now being developed and the need to continue comparative scientific evaluation of them.[38] To cope with the growing problem of driving impaired by the consumption of drugs other than alcohol, new provisions were suggested for medical examinations and the taking of blood and other samples necessary to identify the presence of other intoxicating drugs. The report acknowledged that this was a growing problem with which the law would have to grapple.[39] In the first paragraph of the Commission's report, the way in which the law would increasingly look to science and technology was frankly acknowledged:

> How is the law to deal justly and promptly with those members of society who potentially or actually endanger themselves and others by driving a motor vehicle after having consumed a relevant amount of alcohol or other drug? The question must be resolved in the context of our present law and practice in the administration of criminal justice. The answers will require an examination of scientific instruments that have been devised for the specific purpose of putting at rest many old court-room controversies. New questions are raised concerning the proper faith that may be put by the law in machines, given that the consequences may visit criminal penalties upon the accused. These questions point the way for other likely advances in the years to come. It is therefore important that at the outset we should get right our approach to these novel legal developments.[40]

The Commission's report on Criminal Investigation[41] also reflected the endeavour of the Commission to facilitate the use of science and technology to put at rest disputes relevant to the guilt or innnocence of the accused. A facility for telphone warrants for urgent police searches and arrests was proposed.[42] This facility has now passed into law in the Northern Territory of Australia and there seems little doubt that it will be adopted elsewhere, as a means of retaining the benefit of independent judicial scrutiny of serious police actions, whilst acknowledging the special needs of police to act promptly in a country subject to the tyranny of distance.

Many other proposals in the report could be mentioned. One of them suggested the use of photography to record an identity parade and to place before the jury the way in which the accused was identified, where identity is in issue.[43] The common law acknowledges the special dangers of convictions based on identity evidence.[44] The need to protect against wrongful convictions on erroneous identification evidence cannot be met entirely by the facility of photography or video-recording. But a start must be made. Placing before the tribunal of fact, judge or jury, the actual evidence may be infinitely preferable to a courtroom debate, months later, concerning what occurred.

This principle applies equally to tape recording of confessional evidence. One committee after another, in Britain and Australia, has recommended the introduction of sound recording of confessions to police.[45] Nobody believes that tape recording could be introduced without problems, costs and difficulties. Nobody believes that the tape recorder will be the complete answer to disputed evidence concerning what was said to police.

But is there any doubt that, in time, sound (and probably video) recording of confessions to police will be used to put before the tribunal of fact the actual, alleged confession of the accused? Quite apart from official committees of inquiry, the courts are now, with increasing insistence, suggesting that tape recordings should be used.[46]

Aside from developments such as these, there is little doubt that the new information technology will provide many benefits for the legal profession itself. Word processors are now a commonplace in many Australian legal offices. The Commonwealth statutes are already computerised. A start has been made to computerise the decisions of the High Court of Australia. The Australian Law Reform Commission has used the computer to search the Commonwealth statutes and to identify inconsistencies and outmoded provisions. We have already used computers to analyse surveys conducted in connection with a number of our projects.

CONCLUSION : CAN OUR INSTITUTIONS COPE?

In this short sketch, I have been able to do little more than to outline the way in which technology affects the law, its institutions, its personnel and its procedures. In times gone by, there was usually a 'time cushion' between an important technological development and the need to provide for its social and legal consequences. Enough has been said to show that technological change comes upon us today at an exponential rate. Whether it is in the energy sciences, the new information technology, the biological sciences or genetic engineering, we are seeing changes occur that dazzle the mind and have gone beyond the understanding of most laymen.

Some pessimistic observers say that our institutions, including our legal institutions, will not be able to cope with these changes. Alvin Toffler, in his latest book, 'The Third Wave', prognosticates a breakdown of the lawmaking institutions of the Western community. On the other hand, within Australia, we have developed one means by which our legislators can be assisted to face squarely, and with the best available interdisciplinary advice, the problems posed by technology. I refer to the law reform commissions, and specifically to the Australian Federal Commission. I suggest that its work is worthy of the support of all citizens concerned that our democratic lawmaking institutions should survive and that, in the midst of so many scientific and technological changes, we should not get away from a society ruled for the ordinary man and woman.

FOOTNOTES

1. M.D. Kirby, Twelfth Alfred Deakin Memorial Lecture, Melbourne University Liberal Club, July 1978, 'The Dilemma of the Law in an Age of Violence'.

2. See F.G. Brennan, Law Ethics and Medicine, (1978) 2 Medical Journal of Australia, 577.

3. South Australian Law Reform Committee, Solar Energy and the Law in South Australia, Discussion Paper, 1978.

4. ibid.

5. Notably the report of S. Nora and A. Minc, 'L'Informatisation de la Societe, (Report on the Computerisation of Society), Paris, 1978 (France), and Report of the Consultative Committee on the Implications of Telecommunications for Canadian Society (Clyne Report), Ottawa, 1979 (Canada). There are many other notable reports, particularly in Scandinavia. See, generally, Privacy Protection Study Commission, Personal Privacy in an Information Society, Washington, 1977 (United States) and Report of the Committee on Data Protection (Sir Norman Lindop, Chairman), Cmnd. 7341, London, 1978 (United Kingdom).

6. See M.D. Kirby, 'The Computer, The Individual and the Law', (1981) 55 Australian Law Journal, 443, 451. See also The Law Reform Commission, Discussion Paper No. 16, Reform of Evidence Law, 1980; The Law Reform Commission, Evidence Research Paper No. 3, Hearsay Evidence Proposal, 1981.

7. Sir Roger Ormrod, 'A Laywer Looks at Medical Ethics', in (1978) 46 Medico-Legal Journal 18, 21.

8. ibid.

9. Cited in J.D. Gorby, 'The "Right" to an Abortion, The Scope of the Fourteenth Amendment, "Personhood" and the Supreme Court's Birth Requirement', Southern Illinois Uni Law Journal, No. 1 (1979).

10. Maher v. Roe, 410 US 113 (1973).

11. M.D. Kirby, 'Law for Test Tube Man?', Address to the Fifth Annual General Meeting of Contributors, Queen Victoria Medical Centre, 29 September 1981, mimeo.

12. Pope Pius XII, cited L. Walters, 'Human In Vitro Fertilisation : A Review of the Ethical Literature', Hastings Center Report, 9(4), 1979, 25.

13. A. Huxley, Brave New World, Granada, 1978, 15.

14. Cf. J.N. Santamaria, 'Test-Tube Babies : The Issues Under a Microscope', in The Advocate, 8 October 1981. Dr. Santamaria sees the cost issue as a moral question.

15. Cf. R.A. McCormick, 'Life in the Test Tube', New York Times, 6 August 1978, E7.

16. The Law Reform Commission, Human Tissue Transplants (ALRC 7) 1978.

17. (1963) 31 Medico-Legal Journal, 193. See ALRC 7, 58.

18. Transplantation and Anatomy Ordinance 1978 (ACT), s.42; Transplantation and Anatomy Act 1979 (Qld), s.45; Human Tissue Transplant Act 1979 (N.T.)

19. ALRC 7, 51.

20. British Medical Journal, 28 January 1978, 195.

21. The Australian, 15 October 1981, 15.

22. Australian Academy of Science, 'Recombinant-DNA : An Australian Perspective', 1980, iii.

23. Y. Cripps. 'A Legal Perspective of the Control of the Technology of Genetic Engineering', (1981) 44 Modern Law Review, 369.

24. id., 382.

25. id., 385ff.

26. The Australian, n.21 above.

27. ibid.

28. Weller & Co. v. Foot and Mouth Disease Research Institute [1966] 1 QB 312. The case is discussed in the Australian Academy of Science publication, above, n.22. 60.

29. Report of the Committee of Inquiry into the Smallpox Outbreak in London in March and April 1973. Cmnd. 5626 (1974). See Crispo 372.

30. Crispo. 378.

31. As reported in The Australian. 31 August 1981. 3.

32. ibid.

33. G.L. Ada. 'Genetic Engineering is to be Welcomed not Feared'. in Hobart Mercury. 3 September 1981. 5.

34. Crispo. 371-2.

35. New Scientist. 4 June 1981. 605.

36. Crispo. 377.

37. This point is made by Mr. Justice G.J. Samuels. 'Genetic Engineering : A Legal and Moral Viewpoint'. a lecture to students in the Faculty of Medicine. University of New South Wales. published by the University Public Affairs Unit. 1980.

38. ALRC 4. 125.

39. id.. 131.

40. id.. 1.

41. The Law Reform Commission. Criminal Investigation (ALRC 2). 1975.

42. ALRC 2 95.

43. id. 53.

44. R v. Turnbull [1971] 1 QB 224.

45. For a list of the reports, see Kirby, 'Controls Over Investigation of Offences and Pre-Trial Treatment of Suspects', (1979) 53 Australian Law Journal 626, 628. See also the recent report of the United Kingdom Royal Commission on Criminal Procedure, 1981.

46. See Sholl J. in R v. Governor of Metropolitan Goals; ex parte Molinari [1962] VR 156, 169; Gibbs J. in Driscoll v. The Queen (1977) 51 ALJR 731, 742.