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SCIENCE AND ETHICS

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ISSUES ,

One of the most powerful features of our time is the impact of science and technology on society. This note deals with some ethical issues raised as a consequence. Its brevity will require selectiveness and a hint of dogmatism. Its author's profession will stamp it with a practical perspective, as befits a person daily engaged in the regulation of society.

The scientific developments during the 20th century have been remarkable. Some writers trace the chief of them to a common source in the theories of quantum physics developed by Erwin Schödinger. However that may be, the chief developments clearly include those of nuclear fission, informatics and the biological revolution.

Each of these technological adaptations of scientific knowledge presents acute ethical problems to humanity:

- \* **Nuclear fission:** The control and use of nuclear weapons; the safe use of nuclear power; the serious derogations from freedom required by the great risks involved;
- \* **Informatics:** The threats to individual privacy; the vulnerability of computerised data; the challenge to legal

systems based upon territorial control of a technology which instantaneously spans the continents and reaches out to space;

- \* **Biology:** Multifarious problems are presented by human tissue transplantation; in vitro fertilisation (IVF); eugenics; the use of human gametes; embryo experimentation; and the economics of the availability of expensive treatment, eg AZT for AIDS. Biological concerns extend beyond our species into other life forms. The problems of a safe and healthy global environment are clearly interconnected.

### PROBLEMS

The impact of these scientific and technological developments presents acute dilemmas for individuals, societies and governmental institutions. Amongst the chief problems are:

1. A basic cultural pessimism in Western societies about science and technology. Prometheus, the first mythical technologist, stole fire from the Gods to give it to humans. From ancient times, science and technology have been seen as alien or external to the human condition. Even today, there is an ambivalence in attitudes towards science and technology in most societies, many people being suspicious and afraid;
2. Scientific developments often occur quickly and unexpectedly. They present acute problems require urgent ethical choices to be made. In European cultures, in past centuries, it was possible to defer to an authoritative body, usually the Church, to provide moral guidance. This was often wrong (eg Galileo) but it did not lack certainty, swiftness and authority. Today in most societies there is no equivalent authoritative voice on perplexing ethical issues. Yet that is not an excuse for ignoring them in pluralistic societies which no longer share an

exactly common moral code;

3. The problems of an ethical character which are presented require fine line drawing. Thus, it may become necessary to determine when human life begins for the protection which law and morality accord to it. If it is not at conception, is it permissible to use human gametes for useful scientific experiment? If so, for how many days? Line drawing is as necessary as it is controversial. To endure, moral precepts must appear rational and not simply dogmatic;
4. Good ethics will depend upon a good knowledge of the relevant science and technology. Yet there is often a promethean gulf between the scientist and technologist (on the one hand) and the ethicist, philosopher or theologian (on the other). Their educational disciplines may have been different. Their communication with each other is often poor. The media tend to trivialise and superficialise problems. Scientists and technologists often avoid ethical speculation. Typically, they find the laboratory more congenial. They often tend to resent, as obscurantists, those who raise ethical questions;
5. At the national level, it is difficult to establish acceptable institutions to pose undogmatically ethical questions and to provide thoughtful answers. Some answers may only prove temporary. Some moral dilemmas may go away with changing social attitudes. Artificial insemination donor (AID) is no longer very controversial in most Western societies. IVF is less controversial today than originally. Today the controversies about IVF tend to be different and to involve issues of the economic use of resources and undue pressures upon women to bear children. But most societies need bodies which will help resolve ethical problems when they arise. The

democratic legislature tends to avoid such issues. The procedures of courts are not well adapted to the wide-ranging inquiries and moral speculation needed. New institutions are required or else society will either (a) irrationally impede scientific progress; or (b) allow science and technology to go wherever it will irrespective of ethical implications; and

6. Even national solutions to ethical problems are unsatisfactory. The risks of nuclear waste present transnational problems, as Chernobyl demonstrated. Transborder data flows are not readily susceptible to ethical regulation in one country alone. Some biological experiments challenge the whole species (eg human cloning). Attempts in one jurisdiction to regulate science and technology may merely shift the scientist to a laboratory in a less questioning society. In this sense the ethical dimension, like the scientific and technological dimensions themselves, is now global and universal.

#### CRITERIA

Various régimes have been presented or developed to provide criteria for ethical choices when they have to be made . Because line drawing is required, it is necessary to have some standard by which, eg, to permit or forbid embryo experimentation or computerisation of intrusive hospital records. The various choices available include:

- \* **Revealed truth:** This may be provided either by a religion, elaborated by an authoritative text which may be accepted by believers as the Word of God (eg the Bible, Koran etc). Or there may be an authoritative philosophy, such as Buddhism or Confucianism which has a well worked out code of rules and

rule-makers to govern human conduct;

\* **Ethical systems:** The alternative to revealed truth, with its caste of authorised expositors and interpreters, is a human system of rational ethical rules to which an appeal can be made by which to test the particular problem in hand. Thus there is the intuitive system which suggests that humans know, by intuition, right from wrong so that they need only search that sense or their conscience to come up with the solution to a particular problem. Alternatively, various forms of hedonism teach that good can be distinguished from bad, in science as in everything else, by the extent to which the action in question tends towards human happiness and pleasure. The utilitarians judge conduct by the extent to which it contributes to the greatest good (or happiness) for the greatest number. There are numerous other schools of ethical principle. None commands universal acceptance. In pluralist societies each will have supporters. This makes deriving common criteria for ethical choices by society in science and technology extremely difficult;

\* **Inactivity:** The result is often that ethical choices are either not recognised or, if recognised, ignored or put in the "too hard basket". It is important to understand that this involves an ethical choice. Thus, in informatics, the use of a satellite to beam English language films to vast areas of the earth's surface may harm local languages and cultures. By beaming soft porn movies, such technology may undermine local religious and ethical codes. If there is no ethical decision and follow-up law-making, urgent scientists will go ahead with experimentation on human embryo tissues. They will proceed with IVF until, after a decade or so, it becomes as acceptable

as AID now is. Computers will collect, store and provide vast amounts of personal data until the zone of privacy is reduced virtually to vanishing point. To do nothing in face of radical developments of science and technology is often to make an ethical choice.

### SOLUTIONS

In the face of these problems various solutions have been offered. These include:

- \* **National solutions:** Some problems will be resolved by judges drawing lines by reference to common law, constitutional principles or their own notions of justice and fairness. This is how the abortion problem was solved in the United States of America (*Roe v Wade*). It is how the requirement to provide a life-saving operation to a spina bifida child has been solved in England (*In re B, (a minor)*). Another solution is the establishment of an interdisciplinary committee either to advise on the limits of scientific experimentation or the outcome of technological change or actually to control scientific activity. Sometimes legislation is enacted by Parliament to control or regulate a particular scientific or technological advance. Legislatures, being susceptible to the pressure of special interest groups, tend to be conservative in such regulation. They also tend to be rather dilatory; and
- \* **International solutions:** Increasingly, we are seeing international bodies involved in scientific and technological problems which present ethical questions. Thus the Organisation for Economic Cooperation and Development (OECD) has produced successive Guidelines on the protection of privacy

and the protection of information security. The World Health Organisation has produced Guidelines on various aspects of AIDS. The European Court of Human Rights has delivered decisions requiring changes to the laws of Ireland on the subject of abortion. The United Nations itself has developed international treaties with either explicit (the Nuclear Non-Proliferation Treaty) or implicit (the International Declaration of the Rights of the Child) provisions relevant to technological questions. The global community is at last recognising the global dimension of many of the ethical problems presented by global science and technology.

#### BASIC DILEMMAS

This has been an institutional examination of ethical questions presented by science and technology. Amongst the quandaries it presents are:

1. The law has a necessarily limited rôle in providing solutions to such problems. Law is not coextensive with ethical choices. Although sometimes the law may lend weight to agreed morality (eg the law of murder) the over-intrusiveness of the law can obscure moral issues and even undermine the authority and effectiveness of the law (eg the law on homosexual conduct);
2. There is clearly a problem of ensuring ethical answers which are authoritative enough, developed fast enough and which are bold enough to command community assent and respect;
3. It is also difficult to reconcile an age of rapid scientific and technological change to the modern institutions of a democracy which have been developed to govern a complex society. Legislatures of lay citizens will often not



understand the scientific and technological questions posed. Such questions may be controversial. The temptation is then to put such issues aside. But as I have demonstrated, this is to make an ethical choice; and

4. The international dimension of science and technology today challenges the nation state and obliges the international community to come up with informed institutions which can promote expert examination and national as well as global debate about ethical problems eg informatics, privacy and IVF. Of course, there are some scientists who welcome the inefficiency and inadequacy of moral speculation about, and social regulation of, their activities. They point to Galileo and ask to be let alone with their experiments. In many activities that may be entirely appropriate. But where the global environment is threatened (eg by nuclear materials) or where the human species is involved (eg human cloning) or fundamental social and political values are at stake (eg in some activities of information technology) humanity has an ethical right, and perhaps a duty, to insist that the moral dilemmas are identified and openly debated so that decisions can be consciously made and choices enforced.

#### CONCLUSIONS

It is clear beyond argument that many of the advances of science and technology present ethical quandaries. Sometimes these will be seen more clearly by persons other than the scientists and technologists involved. In some communities, authoritative ethical rules, based upon revealed truth, will be available. But in most modern societies it is more difficult to secure unanimity about line drawing in respect of the ethical outfall of scientific and technological changes. In such societies it will generally be

recognised that there is no single clear-cut solution to the ethical quandaries which are presented. Changes of perception in society will affect ethical responses. But the involvement of the community in cross-disciplinary debate about ethical issues is clearly desirable. Good ethical decisions will necessitate good scientific and technological information and thus the active participation in ethical debates of scientists and technologists. No longer can those debates remain at a local or even national level. They require international participation and the involvement of international organisations wherever our planet and our species are affected. Fortunately, science and technology itself will, through the media, facilitate communication about ethical issues. But whether the human inclination to consider these hard questions will be there is problematical. And whether efficient fora can be developed in remote ethical debate across cultures, languages, disciplines and distance is an important issue worthy of our study.

#### FURTHER READING

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