

The Regulation of Technology

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Everybody recognizes that most of the problems in medical ethics arise, these days, from innovations in medical technology. We would not have had to lay down laws or ethical guidelines about assisted reproduction had it not been for the new technology of in vitro fertilization, which produced the first IVF baby in 1978. We would not be currently anxious about the ethics of possible human cloning, had it not been for the production in Edinburgh of Dolly, the lamb whose birth resulted from the removal of a mammary gland cell from an adult sheep. So the question is whether there is some research into developing technology that is too dangerous, that will lead to consequences too dramatic for humanity, for the research itself to be permitted. Should there be control over what technological innovation should be permitted?

Put like this, the question looks absurd. It is not the discovery of new technological possibilities that is alarming, but the use to which these possibilities may be put. Control should not be over research, but over the uses of research. After all, even Plato, centuries ago, recognized that any skill, or *techne*, could be put to either good or bad use; the skilled doctor could also be a skilled poisoner.

However, the distinction between research and the uses of research is by no means easy to draw. First, it may be argued that if a procedure is shown to be possible (such as, for example, the transplant of organs from one human to another, or, transgenically, from one animal to another), then someone, somewhere, will want to use this technique for therapeutic, not merely for research purposes. Second, the very possibility of such a technique may have been established only by means of its use on subjects, animal or human. There is no way of definitively distinguishing new and untried treatment from research. All treatment is, in some sense, a contribution to research, or may be such. Equally, in the field of medicine all research is undertaken with at least a vague hope that it will one day be used to improve treatment. Medical research is seldom entirely "pure." So the development of new technology cannot be fenced off from its use.

Nevertheless, it could be argued that the development of certain techniques is simply in itself too dangerous to be permitted. In the 1970s, when the genetic manipulation of plants became a widely recognized possibility, a moratorium was, for a time, called on such research, on the grounds that the research itself was too dangerous, carrying as it did a risk to those engaged in it, and a risk of the accidental release into the environment of genetically modified organisms, with unknown consequences. The moratorium did not last; and it is probably true to say that the safety of research workers and of the environment as a whole is better protected than it was because of a greater realization of the risks that may exist unless due care is taken. So the dangers of research are these days seen to be dan-

gers of outcome rather than of the processes themselves. A parallel story could be told of the fears surrounding research in nuclear physics.

Thus the question must be asked again, are there some technologies to develop which would be so threatening that they should be subject to regulation, or even be prohibited by law? The technique of cloning is obviously a candidate for such prohibition. The public reaction to the birth of the lamb, Dolly, was little short of hysterical. On Sunday, 23 February 1997, *The Observer* carried the story of the cloning, to be published with proper scientific dispassion in *Nature* the following Thursday. The press reacted instantly, both in the United Kingdom and abroad. For some reason, Philippe Vasseur, the French Minister of Agriculture, warned Europe of the possibility of six-legged chickens. But, unsurprisingly, most concentrated on the possible use of the technique on humans. The German newspaper *Die Welt* called attention to the political implications of human cloning, saying that Hitler would have used it if it had then been possible; Jacques Santer, the president of the European Commission, instructed Commission officials to investigate whether there was need for EU regulation of cloning; and the German Socialist MEP, Dagmar Roth-Behrend, called for a worldwide moratorium on the technique, on whatever animals it was used. Fortunately, no one rushed out instant regulative legislation. The scientific press managed to come up with explanatory and generally reassuring accounts of the procedure, and the Edinburgh team themselves very sensibly announced that they were not in favor of the use of the technique on humans.

There is, however, a lesson to be learned from the case of cloning. It is tempting for the press (and they are certain to fall for the temptation) to turn the announcement of any new biomedical technique into a shock/horror story; and the public will probably accept what they read and put pressure on Parliament to take steps either to prohibit further research altogether or at least to subject it to nonscientific regulation. To legislate in such circumstances, in response to popular feeling, is almost always a mistake. But in any case there is a fundamental objection to the regulation of scientific research, and in the excitement of the moment it must not be forgotten. It is the need to preserve academic freedom. By this I do not mean an absolute right of scientists or other academics to receive public funding for whatever they want to do, or to teach; I mean rather that academics themselves must be recognized as those who can decide what is or is not worth pursuing. Research, or indeed the content of teaching for that matter, must not be controlled by those who are ignorant. Parliament, and the general public, must trust those who actually know what they are talking about, and must be taught by them. We are all too likely to think that anybody is entitled to hold a moral view, either about what research is or is not worth pursuing, or about what the possible outcomes of such research may be. But this is a false belief; it is not possible to hold a responsible moral opinion on a matter of which one is ignorant. We need to learn the facts, and the probabilities, first, and then form a judgment upon them. Legislation based on popular indignation or fear, then, is nearly always going to be bad legislation that will be later regretted.

However, this is not to say that technology and the search for new technologies must never be subject to legislation. If only to allay public alarm (fear, that is, that scientists are too powerful, and that they like to "play God") it is often necessary that the use of technology should be, if not prohibited in certain cases, then at least regulated. And if necessary the criminal law must be invoked in the case of nonobservance of regulation. For example, so horren-

dous did people find the idea of fertilizing sperm and egg in the laboratory, and keeping the resulting embryo alive in its “test-tube” indefinitely, that a new criminal offense was invented in the legislation of 1990—that of keeping an embryo alive for more than fourteen days after the completion of fertilization, an offense that carries the penalty of up to ten years imprisonment. Some would argue that the creating of human clones by the technique that produced Dolly should likewise become a criminal offense, though I believe that this is unnecessary, at least for the foreseeable future.

If regulation of the uses of new technology is ever to be thought desirable, then the question must arise of who is to take that decision. It may simply be a matter of professional self-regulation, with published guidelines. But, if there are not sufficient grounds to trust the professionals themselves either to follow the guidelines or to submit themselves to inspection to ensure that they are doing so, then it must be a matter for Parliament, and there will, as I have suggested, need to be legislation. Whether or not, in cases of biotechnology, the professionals are to be trusted will depend on the issues involved. But increasingly, it has to be said, there are huge sums of money to be made by pharmaceutical companies, who may develop their own research teams; increasingly patents are taken out for new techniques, and the competition between companies and consequential secrecy makes any kind of inspection or monitoring nearly impossible. We may therefore see more legislation in the field.

Parliament must obviously be well-informed if it is to produce legislation; for the issues involved will be moral issues, involving public policy of a particular kind, namely, that nothing shall be permitted that is genuinely outrageous to the value that ought to be accorded to human beings. And, as I have said, one cannot make proper moral judgments on a basis of ignorance. Here there is, I believe, a genuine role for a committee of enquiry, or royal commission, composed partly of scientists, partly of practicing doctors, partly of lawyers and perhaps philosophers, or other reasonably level-headed persons, who will make the outcome of their deliberations public, will seek evidence and opinions from as many people as possible before reaching their conclusions, and above all will have the task of educating the general public.

This last point is of the greatest importance. Anonymous departmental civil servants—even if, as one hopes, they are strictly impartial and not under pressure from their ministers—cannot take on the educative role that is necessary in such cases. They cannot write articles or take part in broadcasts or lecture tours to explain the conclusions that they recommend and the arguments on which they are based. Without this fairly lengthy process, no regulatory legislation can be satisfactory. In the field of biotechnology, indeed, it is all too likely that legislation, even if it is not hastily cobbled together to allay public fears, will be over-restrictive and will tend to inhibit valuable research.

There is a difficult balance that must, if possible, be achieved between allowing new technologies to be developed which may have quite unforeseen beneficial uses, and on the other hand offending widely held and deep-seated moral feelings. The best that can be hoped for is that by understanding more of the issues in each particular case people may come to feel that the freedoms allowed, and the restrictions imposed, are acceptable, even if not exactly what they would have personally liked to see. It is only if this balance can be achieved that the regulation of technological research can be compatible on the one hand with academic freedom, and on the other hand with a democratic regard for the moral views of people at large.