EMBRYO EXPERIMENTATION
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EXPERIMENTATION

Ethical, legal and social issues

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Foreword

A few years ago an editorial appeared in the *Journal of Medical Ethics* under the title 'Two concepts of medical ethics'. The writer distinguishes between 'the obligations of a moral nature which govern the practice of medicine' (Gordon Dunstan's definition in the *Dictionary of Medical Ethics*) and 'the critical study of moral problems arising in the context of medical practice'. It is a useful working distinction; and we see it at work in this community.

'The obligations of a moral nature which govern the practice of medicine' arise in their acute and ultimate form in the relation between doctor or nurse and patient, at the bedside, in the laboratory. How these obligations are perceived and passed on is largely a matter for the members of the medical professions, however much they may listen to others, be influenced or controlled by them, be those others ethics committees containing members with skills and talents other than those of medical training, or be they legislators who believe themselves to have been charged by the community with the responsibility of controlling medical experimentation or care.

It is with the second sense, 'the critical study of moral problems arising in the context of medical practice', that this book, and behind it the Monash University Centre for Human Bioethics, is concerned. Of course they need each other. The Centre for Human Bioethics would have a sterile existence if there were not medical scientists and practitioners in clinics, hospitals and laboratories aware of obligations; and the work of medical scientists and practitioners, as of committees which advise them and of legislators who would control them, needs the analytical, critical scrutiny of those with minds trained for that purpose. Not surprisingly, and entirely appropriately, that critical study in our community is based in a university. This does not mean that what is said in a volume like this at every point corrects perceptions of obligations obtained elsewhere. After all, even members of the staff of a university only spend a small fraction of their time correcting examination scripts. Their main task, and the task undertaken by the contributors to this symposium, is to ask questions, to ask them critically, that is to say analytically. We do not go to a volume like this to have prejudices, those of ourselves or other people, reaffirmed; but to gain further insight, to think more clearly. This activity must take place if we are to understand better the strengths and weaknesses of what is elsewhere being said and done, or left unsaid and undone, about experiments on embryos. It is to be hoped that the style of this symposium will take out of that discussion some of the heated emotion in which it is sometimes conducted. We cannot expect that
it will remove the statement of fundamental convictions from the debate, not should we wish it to do so; but if it enables us to see more clearly what we are saying when we invoke phrases about the beginning of life, potentiality and the rest it will have served a useful purpose.

Two concluding comments may perhaps be permitted. First, it would be agreed that a discussion of ethical and legal questions is almost fruitless unless we understand the scientific knowledge and processes involved. Many people seem to be able to come to moral and legislative conclusions on the basis of a sketchy or journalistic knowledge of the facts. That would not be good enough for a book or enquiry of this kind. We must be grateful to Dr Karen Dawson who in the following pages puts forth an understanding of the data in terms which are within the grasp of an intelligent and informed reader.

A second comment: it would be easy to be bemused by the newness of the opportunity which IVF provides for research on embryos. Louise Brown's birth in 1978 is in some circles being given the status of a Copernican revolution! We must be grateful to Professor Singer and Dr Kuhse, and to Professor Hare, for putting current concerns in a wider setting. The human race did not start thinking about bioethical questions just yesterday, and it will not stop tomorrow. Indeed, as Professors Gordon Dunstan and John Mahoney in England have shown, a developmental view of the status of the embryo and the fetus has a long and respectable history in Western thought. Perhaps even a little more history of ethical thought would have improved this volume; but one should not ask for everything.

In his highly provocative book, The Closing of the American Mind, Professor Allan Bloom has remarked:

_We are like ignorant shepherds living on a site where great civilizations once flourished. The shepherds play with the fragments that pop to the surface, having no notion of the beautiful structures of which they were once a part. All that is necessary is a careful excavation to provide them with life-enhancing models. We need history, not to tell us what happened, or to explain the past, but to make the past alive so that it can explain us and make a future possible._

Dare one say it, the universities still exist to remind us of that civilization. We need history, but we need more than history. We need systematic, reflective and reasoned thought; and we need to undertake it together. In that this volume contributes to that continuing discussion on one important theme, embryo experimentation, it is to be welcomed. May it have many successors.

Davis McCaughey
Acknowledgements

This volume had its genesis in 1985, when the National Health and Medical Research Council awarded a three-year Special Initiative Research Grant to a research team based at the Monash University Centre for Human Bioethics and consisting of Dr Margaret Brumby, Dr Helga Kuhse, Professor John M. Swan and Professor Louis Waller. Also involved in the project from an early stage was the centre’s Director, Professor Peter Singer. The grant was to investigate bioethical issues in the use of human fetal tissue, in vitro human gametes and embryos.

The aims and methodologies of the research were always interdisciplinary in character, requiring contributions from scientists, lawyers and ethicists working together as a team. Initially Dr Karen Dawson, a geneticist, was employed to carry out research on scientific aspects of the project, Pascal Kasimba to study legal questions, and Lornette Fleming, a philosophy graduate, to conduct research on the ethical issues. Subsequently Ms Fleming left to study at Oxford, and was replaced first by Michaelis Michaelis, and then after his departure by Dr Stephen Buckle. The team of chief investigators also changed. In 1987 Beth Gaze and Dr John Funder replaced Professor Louis Waller and Dr Margaret Brumby as research supervisors; in 1988, when the original grant expired, a related grant was awarded to Professor Singer, Dr Kuhse and Ms Gaze.

This book is one of the products of these grants. We thank the National Health and Medical Research Council for its support; naturally, the council is not responsible for the views expressed in this volume.

We thank in particular John Swan, Margaret Brumby and Louis Waller for helping to put the original team together and for their important contributions during the first stage of the project; Lornette Fleming and Michaelis Michael for their work; and John Funder and Beth Gaze for their continuing assistance. We are also grateful to a still wider range of people who made contributions through a series of public and private seminars and discussions. Medical research workers active in the field of in vitro fertilization and embryo transfer gave generously of their time in informing the research team about the current state of these medical arts. We had numerous valuable discussions with other philosophers, bioethicists, lawyers, health professionals and many others. Members of the Advisory Board of the centre gave us advice on several occasions. There are too many people to thank individually; but without them this book would have been much the poorer. Special thanks
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P.S., H.K., S.B., K.D., P.K.
Introduction

KAREN DAWSON

In 1978 Louise Brown was born: the first child to have resulted from in vitro fertilization (IVF) and embryo transfer (ET). (All technical terms used in this book, whether scientific, legal or philosophical, are defined in the glossary.) Since then IVF clinics have been established in many countries around the world and about 38,000 babies have been born as a result of the new reproductive technology. During the 1980s the range of patients suitable for IVF expanded; instead of being a procedure designed to bypass infertility in women with blocked Fallopian tubes, IVF became a method with broad application in the treatment of both male and female infertility, and a potential research agenda extending into many other fields as well.

These developments in IVF and related research aroused a storm of public controversy. Around the world, governments have established committees of inquiry into the social, legal and ethical impacts of IVF technology. There is very little consensus on what should be permitted and what should be prohibited, or even on the question of whether there should be legislation in this area at all. Very few legislatures have as yet translated into law the recommendations put forward by their various committees, although in several countries there has been legislation enacted dealing with some aspects of IVF. (For a summary, see Appendix 1 of this volume.) This book attempts to take the debate about IVF and embryo experimentation beyond the level of polemic. The essays it contains seek to present the scientific information needed for an assessment of the issues, and to scrutinize, more rigorously and more systematically than has been done previously, the scientific, ethical, public policy and legal issues which must be addressed wherever the new reproductive technology exists.

Attempts at in vitro fertilization (which literally means ‘fertilization in glass’) and embryo transfer in animals date back to the late nineteenth century. The procedures were initially developed for the study of maternal effects on the embryo before and after birth, but until the 1950s any claims that IVF had been achieved were met with scepticism. This initial scepticism was justified when it was shown, in 1951, that sperm had to undergo ‘capacitation’ in order to have the ability to fertilize. The 1960s saw IVF and ET established as techniques used widely in animal breeding. Continued research in reproductive biology since then has led to an enormous body of
*Fig. 1 Summary of fertilization*

**AFTER 9–12 HOURS**
Two pronuclei are clearly visible within the oocyte; one from the sperm and one from the oocyte.

**AFTER 10–22 HOURS**
The chromosomes in each pronucleus are drawn together by microtubules in the cytoplasm.

**22–30 HOURS**
The chromosomes of the sperm and oocyte are combined and syngamy is complete. In 1–3 hours the zygote will undergo the first cleavage division.
information on the in vitro requirements for oocyte (egg) maturation, fertilization and early embryo development for several mammalian species.

This knowledge was first applied to the human in 1965. Robert Edwards published a report on human oocyte maturation in vitro and the subsequent progress of this work led to successful in vitro fertilization of a human egg. In 1971 Patrick Steptoe, Robert Edwards and Jean Purdy published a description of the first human blastocyst observed after in vitro fertilization. This work was the necessary foundation for the first birth from IVF reported by Steptoe and Edwards in 1978.

Knowledge of the process of fertilizing the human oocyte in vitro has increased since that initial phase. Fertilization is a complex process lasting for about 24 hours in humans (see Fig. 1), but it is a procedure carried out successfully about 80% of the time in most IVF programmes. Its success continues to be improved by the use of different conditions for fertilization and increasing knowledge of the process of oocyte maturation. The major factors limiting the success of clinical IVF today relate to the optimal conditions to ensure continued growth of the embryo after fertilization and the losses which occur after transfer of the embryo into a woman’s uterus. Part 1 of this volume contains a discussion of research currently being undertaken to improve IVF and other areas of research which use embryo experimentation.

The scientific research necessary to establish IVF as a clinical process involved the creation of human embryos which were used for research purposes. Often they were destroyed in the process of the research. Some proposals for future research also involve the destruction of human embryos. Is such research morally acceptable? If so, under what circumstances? When does the embryo acquire a moral status which is incompatible with its use and destruction in the course of scientific research? When does an individual begin to exist? Is there, at some time during prenatal development, a crucial ‘marker event’ before which there is no being to whom we have moral obligations, and after which there is? Could this event be fertilization (and is fertilization really an ‘event’ at all, rather than a process which itself needs to be subdivided)? Could it be a later stage, such as the time at which it ceases to be possible for the pre-embryo to split and become twins? Or later still, when the embryo has become a fetus, and is capable of feeling pain? These questions are to some extent familiar from the debate about abortion; but they need to be reconsidered in the special circumstances created by the existence of an embryo outside a woman’s body, and in the light of the new and much more detailed knowledge of embryo development provided by in vitro fertilization. So too with the argument that the embryo has a right to protection because, even if it is not a person, it is a potential person: what difference is made by the knowledge we now have about the relatively poor prospects of early embryos ever becoming people?

All these questions are discussed in the essays on ethics in Part 2. The ethical issues are fundamental to the whole public debate, because if
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we cannot decide whether embryo experimentation is ethically justified (and, if it is, under what conditions) we shall not be in a position to offer a coherent defence of a position either for or against any legislation or regulation which may be proposed.

It has been widely held that resolution of the issues raised by IVF and human embryo research should not be left to the scientists alone; in some instances the scientists themselves have requested government guidelines or legislation to cover some aspects of IVF. Committees set up by governments to consider the new reproductive technology have had to begin by asking how a government should approach such a novel area: should it be by common law, developed by attempting to apply precedents from past cases to novel situations as they come to court? Or by enacting an entirely new piece of legislation? Or through encouraging self-regulation by the scientific and medical professions? The essays in Part 3 of this book deal with the issues that surround the regulation of in vitro human embryo experimentation and clinical IVF in a democratic society. Several of them draw on the experience of the Australian state of Victoria, which in 1984 became the first jurisdiction anywhere in the world to adopt comprehensive legislation on IVF. By rushing in where angels feared to tread, the Victorian Government has made mistakes from which others may be able to learn.

The debate about embryo research is far from finished and will continue to occur wherever governments seek to regulate this rapidly developing area of science. The issues discussed in this volume serve to indicate the problems which face any government setting out along this road.