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Ethics of In-vitro Fertilization

Risk-taking for the Unborn

by MARC LAPPÉ

In the summer of 1959 I worked in the laboratory of embryologist Meredith Runner, then at the Jackson Laboratory in Maine. My supervisor was Dr. Alan Gates, who was among the first to demonstrate that mouse embryos could be flushed from the oviducts by a stream of saline, picked up in a tiny glass pipette, and reintroduced into the uterus of a suitable recipient without damage or loss of viability.

I can recall bending over the hot light of a microscope lamp and peering at two blastocysts that floated in a seemingly vast expanse of saline. A small glass bulb with an even smaller capillary pipette in it dangled at the end of a long rubber tube in my mouth, giving me a crude means of controlling the suction. In time, I was able to pull one of the embryos into the capillary end of the pipette, behind an air bubble needed to mark its position in the tube. I put the pipette aside and turned to look at the anesthetized white mouse at my side. Its right side was shaved down to the pink skin and swabbed with alcohol so that it looked translucent. A glistening red uterus, no wider than a piece of spaghetti, extruded from a slit in the

skin. Holding the uterus gently, I quickly punctured it with the tube, and blew in the speck of life. Fifteen days later a brown mouse was born from a white mother. I was sixteen years old.

Now, almost thirteen years later, I am a member of an Institute where some of my colleagues have questioned the ethical justifications for the very same procedure. But this time the experimental subject is man, and the stakes are considerably higher. As a laboratory student, I could have afforded to make mistakes with "my" mice, even taken the chance of severely damaging a developing embryo. The

Scientists have successfully fertilized a human egg in a test tube and seem on the verge of implanting such an egg in a womb where it will grow to full term.

Although proposed as a means of helping women who are barren because of blocked oviducts, the procedure is considered by some scientists to be such a major new step that the burden of proof should be on those who favor going ahead, rather than on those who would delay.

Here Dr. Lappé, an experimental pathologist and an Associate of the Institute, proposes conditions under which we might go ahead.

first physician attempting embryo transfers in human beings cannot take these risks; it is neither "his" embryo nor anyone else's. Or can he?

Those who oppose the development of the technologies needed for perfecting in vitro fertilization and implantation of human embryos question the propriety of perfecting technologies by experiments on the unborn. They ask if manipulation of such new (and by implication "innocent") life is not itself an abuse of power, and underscore the uncertainties of the procedures by citing the unknown depth of damage and hidden injuries to which such offspring might be subjected.

Is childbearing an inalienable right? The principal justification for attempting in vitro fertilization and reimplantation of human embryos (rather than, say, adoption or artificial insemination) has been to afford childless couples a means of having their own offspring. (In the United States, there are some two and a half million childless couples, a small proportion of whom would qualify for in vitro procedures.) If childbearing were an inalienable right, in vitro fertilization could be justified on the basis that there is a duty to use all technical means pos-

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*This does not resolve the moral issue of parental responsibility,
any more than does the forgiveness of a child with cleft lip*

sible to provide children. In my view, it is illogical and unnecessary to invoke this argument. When we speak of justification for medical practice, we are talking simply about a universal obligation to relieve suffering. And childlessness is a particularly acute form of such suffering. There is a deep and pervasive felt need for family lineage and continuity of generations common to all peoples. I believe that human compassion dictates a response to individual couples who strongly sense that need, including the provision of in vitro fertilization. Moreover, this need is in no way diminished, as some have insisted, by the fact that most causes of female infertility stem from venereal infections. Indeed the need is enhanced by this fact. Rather the key question is whether or not these parents' urgent need for their own child obliges others to assume the unknown risks that experimental procedures on the unborn now entail.

Does the need justify the risks? According to one of the physicians approached by childless couples, the mere risk of a deformity produced during in vitro procedures does *not* dissuade many of them from a willingness to undertake this process if it is the sole means of their bearing children. Their needs are so deeply felt that they are willing to assume responsibility for their child and to provide whatever care it might need were it handicapped. Yet, no one is or will be able to define for them just what risks are involved. Can the parents rightfully assume this responsibility for their unborn child? Admitting but a few conditions, I believe they can. Once such childless couples have been appraised of all of the *foreseeable* hazards in in vitro procedures, there can be no objection to allowing them to make the decision to have a child by this means.

Assuming responsibility for the risks to the unborn. If, in dissuading this kind of childbearing, one raises

the specter of "hidden dangers" and "unforeseeable consequences," he is using a specious moral argument. While it is imperative to weigh the extent and degree of foreseeable damage in vitro manipulations may produce, I recognize that we will only be able to pass judgment on the likely risks. Nevertheless, such an estimation can and must be made. What is necessary is to bring the evidence to bear on possible damage, to assess the risks and then to determine if at some point they fall to an *acceptable* level. In the case of human babies produced by in vitro procedures, presumably this level would be one which was equivalent to the risks normally undertaken in a "natural" pregnancy.

The current weight of public opinion and common standards of medical practice regarding the restoration of fertility to childless couples greatly reduces the cogency of any argument which would protect the in vitro embryo from any and all potential risks of damage. Fertility drugs which induce super-ovulation are used without regard to the likelihood of multiple births and resulting stunting of fetal growth, prematurity, and higher risk of respiratory disease and death. Artificial insemination with husband or donor semen is practiced on an ever more regular basis without knowledge of the possible increased incidence of mutations as the result of sperm storage or other uncertainties entailed in the insemination procedure. Moreover, this society has sanctioned the use of sex steroids like diethylstilbestrol to help women who are habitual aborters to have their own children, even when the safety of this artificial steroid was incompletely known.

Even in the face of current evidence that this latter steroid procedure probably caused vaginal tumors in girls born of diethylstilbestrol treated mothers, it is difficult to say that this

procedure was unwarranted. Would such girls and their as yet unaffected siblings be better off unborn? At least one parent living with the uncertainty of whether or not her daughter will be affected has told me that she feels it was worth the risk. Certainly her daughter does. But this does not resolve the moral issue of parental responsibility, any more than does the forgiveness of a child with cleft lip. In either instance, the morality of parental choice could only be dictated by the knowledge of likely risk at the time. One might hope that with the increased availability of genetic counseling *responsible* choice may be enhanced, but that the moral right of parents to decide to bring their children into the world when they believe there is a reasonable probability of normalcy remains unscathed. This assumption is the moral basis of all genetic counseling.

Likely risks of in vitro procedures. What might be the real risks of manipulating human embryos in vitro? Recent evidence of the resiliency of the early mammalian embryo certainly indicates that fears of gross monstrosities are probably unfounded. It has proven possible in mouse embryos, for example, to introduce living cells from unrelated embryos in vitro, and then implant them in the uteri of surrogate mothers. The observable incidence of abnormalities in these and other artificially implanted mouse embryos (of which there are now many hundreds) has proven to be no greater than that occurring naturally—and perhaps even less. This has even proven true when the embryos have been subjected to the extreme manipulation of stripping off their protective outer cover and actually fusing them with a second embryo. This is not to say that human embryos would prove comparably resilient, but certainly there is no evidence to date to indicate that the physical procedures involved in these manipulations provide any discernible

teratogenic (monster-producing) stimulation.

What about the combined procedure of in vitro fertilization coupled with implantation? Here the data is less complete, although a recent study has shown that of the successfully fertilized mouse ova which became blastocysts, nearly half implanted and went on to develop normally. The rest were never recovered.

The loss of this seemingly high proportion of embryos underscores a basic feature of embryonic development: a significant proportion of fertilized eggs in nature do not go to term. (As many as 10% to 20% of all human pregnancies may undergo spontaneous abortion.) The loss of these early embryos appears to be a selective process whereby abnormal embryos die in greater numbers than do normal ones. Although the exact proportion is incompletely known, as many as 80% of all chromosomally abnormal embryos may be lost during the first and second trimester of pregnancy. Thus, there is reason to believe that potentially abnormal human embryos developed in vitro would be subject to a winnowing process which would help reduce (but not necessarily eliminate) abnormal embryos. Other techniques, such as ensuring that overripe ova are not used and monitoring the early pregnancy by amniocentesis for possible genetic and chromosomal abnormalities, could further reduce the risks of developmental anomalies by permitting abortion of affected fetuses. These arguments reduce, but do not eliminate, the question of more subtle damage.

Throughout this discussion I have acknowledged that no one will be able to say when and if in vitro fertilization in man will become a risk-free procedure. But I have emphasized that traditionally no one has insisted that "natural" reproduction be completely safe for the fetus before it is undertaken. Even in the most extreme cases, for example among women with phenylketonuria, whose offspring are virtually certain of receiving some damage during gestation, no one has enjoined them for procreating except by moral suasion. Bentley Glass has stated that the preeminent right of the

fetus is that it have a sound physical and genetic constitution—a lofty, but impractical, ideal. Would we constrain all couples who are carriers for the same deleterious recessive disease (such as sickle cell trait carriers) from childbearing simply because there is a tangible risk—here one in four—of having a child with the disease? If we accept the morality of couples making this childbearing decision, can we deny the needs of a couple childless because of the woman's blocked oviducts? Here the risk to the fetus in utero is probably also small but unknowable. What are our ethical obligations to these childless couples and their as yet unborn children?

Sanctioning in vitro experimentation. I would first urge that all possible areas of knowable risk be exhaustively studied before the first human implantation experiment is performed. This would certainly entail experiments in higher primates or monkeys. Secondly, I would urge that the national and perhaps the international scientific community be involved in the decision-making. The moral issue of human embryo manipulation is so great and of such importance to the course of the history of man, that nothing short of a consensus of the scientific communities involved would be needed before proceeding. One has only to envision those tiny groups of men with whom Oppenheimer caucused in closed rooms on the desirability of unleashing a nuclear holocaust on Japan, to recognize that we need large scale involvement in decision-making of this kind.

Admittedly, the process of reaching this consensus is virtually unprecedented, but the stakes are so high and the symbolic impact of failing to act in this way so great, that the effort would be justified. The first step would be a moratorium on experiments leading directly to human egg implantation. The second would be the establishment of an international body to study systematically the scientific basis of in vitro manipulation in man. Finally, one can only hope that the first baby fertilized in vitro would be produced as the endpoint of a collective and public effort of responsible scientists, and not as the premature experiment of a single physician or scientist.

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