

IN VITRO FERTILIZATION, SURROGATE MOTHERHOOD, AND SEX ORGAN TRANSPLANTS

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GENERAL AND MEDICAL ASPECTS

The efforts of Drs. Patrick C. Steptoe and Robert G. Edwards in England culminated in the birth of Louise Brown on July 25, 1978, as a result of *in vitro* fertilization and reimplantation of the human embryo into the mother's womb.¹ The same investigators later reported the birth of a boy by this technique.² Since then, several hundred babies have been born by this methodology. More recently, fertilized ovum removal from the womb of one woman and its implantation into a recipient mother has been accomplished with the birth of healthy infants.

This chapter examines the legal, moral, ethical, and religious issues involved in *in vitro* fertilization and reimplantation of the human zygote either into the biologic mother's womb or into a surrogate or host mother's womb. Other related issues will also be mentioned where appropriate. For example, basic principles related to the paternity or maternity of the offspring of *in vitro* fertilization and reimplantation are derived from experience and knowledge about artificial insemination. The latter subject in turn relates to genetic screening and prenatal diagnosis. If amniocentesis reveals the presence of twins, one of whom is normal, the other being afflicted with a serious genetic defect, a serious medical and moral dilemma occurs. It is now possible to selectively terminate or abort the abnormal fetus by intracardiac puncture and exsanguination and to deliver

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1. P. Steptoe & R. Edwards, Birth After the Reimplantation of a Human Embryo, in *Lancet* 2 366 (1978).

2. R. EDWARDS & P. STEPTOE, A MATTER OF LIFE (1980).

the normal fetus at term,³ an accomplishment highly publicized in the lay press in view of the danger to the normal fetus.⁴ Although it is medically feasible, is this procedure ethically and morally justified?

The transmission of serious genetic defects by artificial insemination using donor sperm from individuals not screened for genetic diseases is also being recognized with increasing frequency.⁵ In a recent review of current practice of artificial insemination by donor in the United States, the authors concluded that the screening of sperm donors for genetic diseases is inadequate and that a list of genetic traits needs to be established that can be used routinely for screening donors.⁶ This procedure will ensure that children born through artificial insemination have a minimum of genetic defects. What are the ethical, moral, and legal considerations in the establishment and implementation of such procedures?

It is now possible, even if a single unborn fetus is severely abnormal, to perform delicate intrauterine surgery to correct the fetal defect.⁷ The ethical dilemmas of this issue were discussed by Fletcher in an editorial,⁸ and need to be further explored.

Are there alternatives to *in vitro* fertilization? In a monkey, it is possible to remove an egg from the ovary and to reinsert it low in the Fallopian tube below the point of blockage with subsequent fertilization *in vivo*.⁹ Another technique is to bypass the Fallopian tube altogether and to place the ovum directly within the uterine lumen, anticipating that fertilization, cleavage of the embryo, and nidation might all be accomplished within the uterus. A third technique is to insert an egg-embryo chamber in the abdomen into which the fertilized egg is placed, to be transferred at an appropriate time to the uterus. These procedures are still experimental but may, in the future, provide the woman suffering from a "hopeless" tubal condition

3. Kerenyi & Chitkara, *Selective Birth in Twin Pregnancy with Discordancy for Down's Syndrome*, 304 NEW ENG. J. MED. 1525-27 (1978).

4. Schmeck, Jr., *Twin Found Defective in Womb Reported Destroyed in Operation*, N.Y. Times, June 18, 1981, at 1, 19; Edelson, *Rare Abortion Saves a Twin*, N.Y. Daily News, June 18, 1981, at 4.

5. Johnson, Schwartz & Chutorian, *Artificial Insemination by Donors: The Need for Genetic Screening, Late-Infantile GM2—Gangliosidosis Resulting from This Technique*, 304 NEW ENG. J. MED. 755-57 (1981); Shapiro & Hutchinson, *Familial Histiocytosis in Offspring of Two Pregnancies After Artificial Insemination*, 304 NEW ENG. J. MED. 757-59 (1981).

6. Curie-Cohen, Luttrell & Shapiro, *Current Practice of Artificial Insemination by Donor in the United States*, 300 NEW ENG. J. MED. 585-90 (1979).

7. Harrison, Golbus, & Filly, *Management of the Fetus with a Correctable Congenital Defect*, 246 J. AM. MED. ASSOC. 775-77 (1981).

8. Fletcher, *The Fetus as Patient: Ethical Issues*, 246 J. AM. MED. ASSOC. 772-74 (1981).

9. Hodgen, *In Vitro Fertilization and Alternatives*, 246 J. AM. MED. ASSOC. 590-97 (1981).

with several effective therapeutic courses from which to select that may enhance her prospects of successful pregnancy.

Another related issue is the subject of sex organ transplants. Fallopian tube transplantation followed by successful pregnancy has been observed on several occasions in animals and humans, thus providing another alternative to *in vitro* fertilization for Fallopian tube disease.¹⁰ Ovarian transplantation has also been accomplished in both animals and in the human female.¹¹ Testicular transplantation of an intraabdominal testicle into the scrotum of the same person is technically feasible.¹² Testicular transplantation from one identical twin born with two normal testes to the other twin born with no testes, with subsequent siring of a child by the previously sterile recipient twin, has also been achieved.¹³

If the ovary of a fertile woman is transplanted into the body of a previously barren woman to enable her to become pregnant and bear children, then to whom do the children legally belong, the donor or the recipient of the ovary? What is the filial relationship of a child born following a testicular transplant? These and other moral and ethical questions are tangential but related to the question of the parenthood of a fertilized egg or fetus implanted in a host mother.

LEGAL ISSUES AND PUBLIC POLICY

Numerous legal issues have been raised by surrogate mother arrangements. In the typical case, a woman agrees to be artificially inseminated with the sperm from a man whose wife cannot conceive. The surrogate mother also agrees to relinquish her parental rights and turn over the baby to its biological father and his wife, who may then become its adoptive parents. One of the main legal controversies is whether or not the surrogate mother can be paid for these services.

In an article entitled "Contracts to Bear a Child: Compassion or Commercialism?" some of the following legal questions are raised:¹⁴ If a surrogate mother receives a fee, is she being compensated for in-

10. Cohen, *Fallopian Tube Transplantation and Its Future*, 23 CLINICAL OBSTETRICS & GYNECOLOGY 1275-92 (1980).

11. Sturgis & Csatellanos, *Ovarian Homografts in Organic Filter Chambers*, 156 ANNALS OF SURGERY 367-76 (1962); Blanco, *Ovarian Transplantation in the Human Female* (Paper presented before the Eighth Congress of Fertility and Sterility, Buenos Aires, 1974).

12. Sibling *The Intra-Abdominal Tests: Microvascular Autotransplantation*, 125 J. OF UROLOGY 329-33 (1981).

13. Silber, *Transplantation of a Human Testis for Anorchia*, 30 FERTILITY AND STERILITY 181-87 (1978).

14. Annas, *Contracts to Bear a Child: Compassion or Commercialism*, 11 HASTINGS CENTER REP. 23-24 (1981).

convenience and out-of-pocket expenses, or is she being paid for her baby? Should the surrogate be married or single; have other children or have no children? Should the adoptive parents (including the biological father) meet the surrogate? Should the child know about the surrogate arrangement when he or she grows up? Is monetary compensation the real issue? What kind of counseling should be done with all parties, and what records should be kept? And isn't this a strange thing to be doing in a country that records more than a million and a half abortions a year? Why not attempt to get women who are already pregnant to give birth instead of inducing those who are not pregnant to go through the "experience"?

Is it proper for surrogates to have children to be turned over to single people or homosexual couples? Does the impregnation of the surrogate mother with a married man's sperm amount to adultery? Does the impregnation of a woman with her brother-in-law's sperm constitute a type of incest? What if the surrogate mother decides to have an abortion or to keep the baby? What if the adoptive parents die or get divorced before the birth, or decide they do not want the baby after all? What if the child is born defective? These questions, and many others, merit serious consideration. So far, legal debate has focused primarily on the issue of whether or not surrogate parenting is to be considered baby selling.

Some legal issues related to human *in vitro* fertilization were recently highlighted by Evans and Dixler.¹⁵ The four principal areas of legal concerns are the rights, if any, of the fertilized human egg before implantation (there is a rich body of law on the rights of the unborn but no law on the rights of the test tube embryo); the rights of the would-be parents; the rights and liabilities of the physician and hospital; and the public interest expressed through governmental regulation of the procedure. Because of the legal complexities involved with the *in vitro* fertilization procedure, and because of the lack of legal precedent to guide the parties, the above authors suggest that a written contract be drawn up and make specific proposals about the format and content of such a contract.

MORAL AND ETHICAL ISSUES

Long before the birth of Louise Brown in 1978 by *in vitro* fertilization, the ethical and moral issues involved in this procedure were discussed and debated. On the negative side, one author questions the propriety of perfecting the technologies of human reproduction

15. Evans & Dixler, *Human In Vitro Fertilization: Some Legal Issues*, 245 J. AM. MED. ASSOC. 2324-27 (1981).

by experiments on the newborn and the unconceived.¹⁶ He further argues that because the new procedures for *in vitro* fertilization and laboratory culture of human embryos may carry a serious risk of damage to any child so generated, there appears to be no ethical way to proceed. One cannot ethically choose for a child the unknown hazards that he must face, and simultaneously choose to give him life in which to face them. Also strongly opposed to *in vitro* fertilization is a prominent theologian who asserts that this procedure "constitutes unethical medical experimentation on possible future human beings, and, therefore, it is subject to absolute moral prohibition."¹⁷ He rejects rejoinders to all his arguments and concludes that "unless the ethics of the medical research profession is to be radically revised or abandoned we ought not to manipulate or risk the child-to-be." He abhors the extent to which human procreation has been replaced by the idea of "manufacturing" our progeny. He further urges more "animal work" before proceeding to human experimentation, considers *in vitro* fertilization to be pure medical research and not therapeutic in the usual sense, and charges that it is immoral to discard or "terminate the lives of the zygotes, the developing cluster of cells, the blastocysts, the embryos, or the fetuses it will be necessary to kill in the course of developing this procedure."

On the other hand, one of the physicians who was responsible for the birth of Louise Brown justifies his work by saying that in animals the preimplantation embryo is highly resistant to malformation, and that human volunteers are not only experimental subjects but have a chance of ultimately personally benefiting from the work while the methods and technology are being developed.¹⁸ The reimplantation of a human embryo into the mother for the cure of infertility seems to need no moral justification if no other method can be used. Although the underlying infertility is not cured, the desire of (and biblical command to) the parents to have children is fulfilled. The situation is perhaps analogous to a diabetic whose clinical signs and symptoms are treated by insulin but whose underlying disorder is not cured thereby. Edwards is more cautious, however, in his moral approach to the case of surrogate mothers, since there might develop conflicting claims on the child by the embryo donor and the uterine mother, and divided loyalty of the child itself. Further, the surrogate

16. Kass, *Babies by Means of In Vitro Fertilization: Unethical Experiments on the Unborn?* 285 NEW ENG. J. MED. 1174-79 (1971).

17. Ramsey, *Shall We 'Reproduce'? I. The Medical Ethics of In Vitro Fertilization. II. Rejoinders and Future Forecast*, 220 J. AM. MED. ASSOC. 1356-60, 1480-85 (1972).

18. Edwards, *Fertilization of Human Eggs In Vitro: Morals, Ethics and the Law*, 49 Q. REV. BIOLOGY 3-26 (1974).

mother might request an abortion or refuse to hand over the child, the donor might reject the child at birth, or the child might suffer psychologically on learning of the circumstances of its birth.

Does one tell the child born of a surrogate mother and/or following *in vitro* fertilization of the circumstances surrounding its birth? What does the surrogate mother tell her own children or friends and neighbors or colleagues at work about the "loss" of the baby if she surrenders it to the adoptive parents? Should she lie, saying the baby died? What if the adoptive parents die or get divorced before the birth of the child, or decide they do not want the baby after all? What if the child is born defective?

The discussion about the morality and ethics of *in vitro* fertilization and surrogate motherhood relate to similar discussions in regard to abortion, contraception, artificial insemination, genetic engineering, cloning, and the like. These subjects are clearly beyond the scope of this essay. I will also not review the discussions defining the moment when human life begins, the Divine nature of procreation and the marital relationship, the possible "debiologization" of family life,¹⁹ and related issues.

Suffice it to say that *in vitro* fertilization is strongly opposed on moral and ethical grounds by some writers,²⁰ and just as strongly justified by others, who argue that the procedure "does not pose any moral problems."²¹ To assist in resolving the issues following several years of debate in scholarly and professional journals, a 1975 ban on government funding of human research in this area, and the work of the National Commission for the Protecting of Human Subjects on fetal research, the Secretary of the United States Department of Health, Education and Welfare established an Ethics Advisory Board. The board rendered its report on March 16, 1979, and concluded that, with certain constraints, research on *in vitro* fertilization and embryo transfer, it is ethically acceptable. The board agreed "that the human embryo is entitled to profound respect; but this respect does not necessarily encompass the full legal and moral rights attributed to persons." The board expressed concern about the still unanswered questions of safety for both mother and offspring of *in vitro* fertilization and embryo transfer, and about the health and legal status of the children born following such a procedure.²²

To show respect for life when *in vitro* fertilization is coupled

19. McCormick, *Genetic Medicine: Notes on the Moral Literature*, 32 THEOLOGICAL STUDIES 531-32 (1972).

20. Kass, *supra* note 16; Ramsey, *supra* note 17.

21. Edwards, *supra* note 18.

22. Steinfels, *In Vitro Fertilization: Ethically Acceptable Research*, 9 HASTINGS CENTER REP. 1-8 (1979).

with embryo transfer because an infertile couple is being helped to have a child, the Ethics Advisory Board recommended that the government support research provided that:

- A. If the research involves human *in vitro* fertilization without embryo transfer, the following conditions are satisfied:
 1. the research complies with all appropriate provisions of the regulations governing research with human subjects;
 2. the research is designed primarily to establish the safety and efficacy of embryo transfer and to obtain important scientific information toward that end not reasonably attainable by other means;
 3. human gametes used in such research will be obtained exclusively from persons who have been informed of the nature and purpose of the research in which such materials will be used and have specifically consented to such use;
 4. no embryos will be sustained *in vitro* beyond the stage normally associated with the completion of implantation (14 days after fertilization); and
 5. all interested parties and the general public will be advised if evidence begins to show that the procedure entails risk of abnormal offspring higher than those associated with natural human reproduction.
- B. In addition, if the research involves embryo transfer following human *in vitro* fertilization, embryo transfer will be attempted only with gametes obtained from lawfully married couples.

A critic of the board's report asks whether it is appropriate for such a board to be so structured that more than half of the members represent the medical and research community. The critic questioned whether a board constituted largely of researchers and oriented to their ethical concerns can be relied upon to say no to research, or whether they may be overwhelmingly disposed to judge research as "ethically defensible."²³ Responding to this criticism, one of the members of the board writes that it would have been inappropriate for the board to have made ethical recommendations and taken public policy stances by adopting any one of the following three positions: that the fertilized ovum is a person with all the claims and rights of persons; that the fertilized ovum is disposable material; or that the fertilized ovum is a living human being, deserving of awe and respect even if not meriting the fullest range of pro-

23. *Id.*

tection we accord persons.²⁴ To decree or stipulate that one of these positions is certainly the right one would have been impossible for the board; hence, the phrase "acceptable from an ethical standpoint" must be understood to mean "ethically defensible but still legitimately controverted."²⁵ However, that which is ethically defensible may not necessarily be morally right. "Active euthanasia, deception in research, amniocentesis for sex choice, bypassing informed consent, and possibly even infanticide are all issues where serious, plausible and favorable arguments have been made. Are they ethically acceptable because defensible?"²⁶ A stalemate on federally funded test tube baby research has developed,²⁷ while *in vitro* fertilization moves ahead clinically.

The 1981 Principles of Medical Ethics of the American Medical Association ("AMA") state that it is not unethical for a physician to perform *in vitro* fertilization and embryo transplantation within the confines of the professional physician-patient relation upon obtaining the patient's voluntary and informed consent.²⁸ Only physicians with special knowledge and competence in the use of such procedures should perform them. The patient's expectations of confidentiality should be preserved in all instances. The AMA statement continues by asserting that since *in vitro* fertilization and embryo transplantation is a new and experimental procedure, research studies are needed for the necessary medical knowledge and skills to be developed. Selecting and screening donors to control the transmission of infectious and genetic disease, to the extent current knowledge permits, should be required. To protect the interests of women wishing to be involved in such research projects, the following guidelines should apply:

- A. Voluntary and informed consent, in writing, should be given by the patient.
- B. Alternative treatment or methods of care should be carefully evaluated and fully explained to the patient. If simpler and safer treatment is known, it should be pursued.
- C. If possible, the risk to the embryo or fetus should be as minimal as is scientifically known to be possible.

24. McCormick, *The EAB and In Vitro Fertilization*, 9 HASTINGS CENTER REP. 4 (1979).

25. Steinfelds, *The EAB and In Vitro Fertilization*, 9 HASTINGS CENTER REP. 4, 16 (1979).

26. *Id.*

27. Abramowitz, *A Stalemate on Test Tube Baby Research*, 14 HASTINGS CENTER REP. 5-9 (1984).

28. Rendfeld, *Recent Opinions of the Judicial Council of the American Medical Association*, 251 J. AM. MED. ASSOC. 2078-79 (1984).

These standards should also protect the interest of the fetus and potential newborn, to as great an extent as seems analytically possible.

The debates about the moral and ethical issues involved in *in vitro* fertilization, surrogate motherhood, and related subjects will probably continue for many years to come.

THE JEWISH VIEW

It is a cardinal principle in Judaism that life is of infinite value and that each moment of life is equal to seventy years thereof. In Jewish law, all biblical and rabbinic commandments are set aside for the overriding consideration of saving a life. It is, therefore, permitted and even mandated to desecrate the Sabbath to save the life of someone who may only live for a short while and certainly for a patient who may recover from illness or traumatic injuries.

A second fundamental principle of Judaism concerns the sanctity of human life. Man was created in the image of God and, hence, human beings are holy and must be treated with dignity and respect, in life and after death. Our bodies are God-given, and we are commanded to care for our physical and mental well-being and to preserve and hallow our health and our lives. Only God gives and takes life.

Are we tampering with life itself when we perform *in vitro* fertilization? Are we interfering with the Divine plan for humanity? If God's will is for a man and/or a woman to be fertile, who are we to undertake test-tube fertilization and embryo reimplantation into the natural or genetic mother, or into a host or surrogate mother, to overcome the infertility problem?

Judaism teaches that nature was created by God for man to use to his advantage and benefit. Hence, animal experimentation is certainly permissible provided one minimizes the pain or discomfort to the animal. The production of hormones such as insulin from bacteria or in tissue culture or in animals by recombinant DNA technology for man's benefit also seems permissible. Gene therapy, such as the replacement of the missing or defective gene in Tay-Sachs disease or hemophilia, if and when it becomes medically possible, may also be sanctioned in Jewish law. But is man permitted to alter humanhood and/or humanity by *in vitro* fertilization, by transfer of the embryo from a woman inseminated with her husband's (or other) sperm into another woman's womb, or by artificial gestation in a test tube or glass womb, or by sex organ or gene transplants, or by genetic screening and/or counseling, and the like?

There exists a considerable body of rabbinic writings devoted to

artificial insemination,²⁹ and many of the principles cited therein apply equally to *in vitro* fertilization. In a recent review, Stern cites Jewish sources which describe pregnancy *sine concubito*, including impregnation in a bathhouse, and discusses the following questions: the legal relationship of the offspring to the sperm donor; the possible fulfillment of the commandment of procreation by the sperm donor; the legality of procurement of sperm from the husband for artificial insemination and the preferred methods for its procurement; the insemination of the husband's sperm into his wife during or shortly after her menstrual cycle when she is *niddah* (ritually unclean); the possibility of the insemination itself rendering her ritually unclean by "opening the mouth of the womb"; the question of the woman becoming ritually unclean following birth after artificial insemination; whether such a male child may be circumcised on the Sabbath; whether such a child absolves the obligation of levirate marriage; whether or not a woman who is inseminated with donor sperm becomes prohibited to her husband; the legitimacy or bastardy of the offspring of artificial insemination using donor sperm; the case where sperm of the husband was mixed with donor sperm prior to insemination; whether or not a woman who claims she became pregnant in a bathhouse is believed; whether or not a husband can divorce his wife if she underwent artificial insemination without his knowledge; the obligation of the father to support his child born after artificial insemination; the status of the child if the sperm donor was a bastard; the case of insemination of semen from a priest into a profaned woman; whether levirate marriage can be consummated through artificial insemination; and the possible legality of using sperm from a gentile donor for artificial insemination into a Jewish woman.³⁰

In brief, there is near unanimity of opinion that the use of semen from the husband is permissible if no other method is possible for the wife to become pregnant. However, certain qualifications exist. There must have been a reasonable period of waiting since marriage (two, five, or ten years or until medical proof of the absolute necessity for artificial insemination), and, according to many authorities, the insemination may not be performed during the wife's period of ritual impurity. Artificial insemination using the semen of a donor other than the husband is considered by most rabbinic opinion to be an abomination and strictly prohibited for a variety of reasons, including the possibility of incest (the child born of such insemination

29. Rosner, *Artificial Insemination in Jewish Law*, 19 JUDAISM 452-64 (1970); Jakobovits, *Artificial Insemination*, in JEWISH MEDICAL ETHICS 244-50, 261-66 (Bloch ed. 1975).

30. 1 M. STERN, HAREFUAH LE'OR HAHALACHAH [Medicine in the light of Halachah] pt. 1-2 (1980) (discussing abortion and artificial insemination).

may later marry a sibling, unknowingly), lack of genealogy (the father's identity is unknown), and the problems of inheritance (does the child inherit the real father, the adopted father, or both). A few rabbis regard such insemination as adultery, requiring the husband to divorce his wife and her forfeiture of the marriage settlement (*ketubah*). Most rabbinic opinion, however, states that without a sexual act involved, the woman is not guilty of adultery and is not prohibited to cohabit with her husband.

Regarding the status of the child, rabbinic opinion is divided. Most consider the offspring to be legitimate, as was Ben Sira, the product of conception *sine concubito*; a small minority of rabbis consider the child illegitimate, and at least two authorities take a middle view. Considerable rabbinic opinion regards the child (legitimate or illegitimate) to be the son of the donor in all respects (i.e., inheritance, support, custody, incest, levirate marriage, and the like). Some regard the child to be the donor's son only in some respects but not others. Some rabbis state that although the child is considered the donor's son in all respects, the donor has not fulfilled the commandment of procreation. A minority of rabbinic opinion asserts that the child is not considered the donor's son at all.

It is permitted by most rabbis to obtain sperm from the husband both for analysis and for insemination, but difference of opinion exists as to the method to be used in the procurement of it. Masturbation should be avoided if at all possible, and *coitus interruptus*, retrieval of sperm from the vagina, or the use of a condom seem to be the preferred methods.

In vitro fertilization, embryo transfer, host motherhood and sex organ transplants in Jewish law have been the subjects of several recent publications in Hebrew and in English.³¹ In a situation in which the husband produces far too few sperm with each ejaculate to impregnate his wife or where a woman is unable to move the egg from the ovary into the uterus because of blocked Fallopian tubes, the former Israeli Chief Rabbi Ovadia Yosef gave his qualified approval to the *in vitro* fertilization of the woman's egg with the husband's sperm and the reimplantation of the fertilized zygote or tiny embryo

31. Hershler, *Bayoth Hilchatiyoth Betinok Mavchanah* [Jewish legal issues relating to test-tube babies], 1 HALACHAH UREFUAH 307-20 (1980); Dori, *Hahanadassah Hagenetis: Lynn Rishoni Beheebatim Hamishpatiyim Vehahalachotiyim* [Genetic engineering: Preliminary discussion of its legal and halachic aspects], TECHUMIN 280-96 (Winter 1980); Steinberg, *Tinok Mavchanah* [Test-tube baby], 6, no. 3 ASSIA 11-16 (1979); Bleich, *Test Tube Babies*, in JEWISH BIOETHICS 80-85 (F. Rosner & J. Bleich ed. 1979); Bleich, JUDAISM AND HEALING: HALAKHIC PERSPECTIVES 85-95 (1981); Bleich, *Host Mothers*, in CONTEMPORARY HALAKHIC PROBLEMS 106-08 (1977); A. Rosenfeld, *Generation, Gestation and Judaism*, 12 TRADITION 78-87 (1971).

into the same woman's womb.³² Another former Chief Rabbi, Shlomo Goren, asserted that conception in this manner is morally repugnant but legally unobjectionable. This situation represents a type of barrenness akin to physical illness and, therefore, justifies acts which entail a small amount of risk, such as the procurement of eggs from the mother's ovary by laparoscopy, a minor surgical procedure.

There is certainly no question of adultery involved, since the sperm used is that of the husband. Sperm and egg procurement for this procedure are permissible because the aim is to fulfill the biblical commandment of procreation. The offspring is legitimate and the parents thereby fulfill their obligation of having children. However, certain serious moral and Jewish legal problems relate to this type of test-tube baby.³³ If one uses sperm other than that of the husband, then objections as discussed above under artificial insemination exist. Furthermore, if one obtains several eggs from the mother's ovary at one time and fertilizes all of them so as to select the best embryo for reimplantation, is one permitted to destroy the other fertilized eggs? Do they not constitute human seed and, therefore, should not be "cast away for naught"? Is one permitted to perform medical research on the unused fertilized eggs? What is the status of other fertilized ova in the test tube? Is the destruction of such fertilized ova tantamount to abortion? Is such a fertilized ovum regarded as "mere water" during the first forty days of its development?

In Judaism there is no concept of waste applied to the tens of millions of superfluous sperm which are lost following normal coitus. Perhaps excess fertilized eggs might be implanted into non-ovulating women. What, then, should be the approach if no woman is available for an additional implant and there has been more than one successful fertilization? If a fertilized ovum is "more than nothing," would Jewish law mandate *in vitro* procedures with only one ovum at a time? There may well be a Jewish legal and ethical distinction between a fertilized egg in a test tube and a fertilized egg in a uterus. The question of the possible independent existence of a zygote has legal import. Jewish law requires the desecration of the Sabbath to preserve the existence of an embryo in the mother's womb even less than forty days old. If there is no human fetal life outside the uterus, a superfluous fertilized ovum could be disposed of by any means, such as flushing down the drain. An alternative course of action would be to refrain from supplying nutrients to the ovum, thereby allowing it to perish. One can redefine the question in terms of

32. Bleich, *Test Tube Babies*, *supra* note 31; Bleich, *Host Mothers*, *supra* note 31.

33. Rosner, *In Vitro Fertilization and Surrogate motherhood: the Jewish View*, 22 J. RELIGION & HEALTH 139-60 (1983).

whether or not an unfertilized egg may be deemed to be of ethical import as potential life. Because the vast majority of unfertilized sperm and eggs are never fertilized and do not constitute new life, only a fertilized ovum might be considered as potential life. If a fertilized ovum were equated with human life, then Jewish law would even require the expenditure of substantial sums of money to transport a superfluous fertilized ovum great distances, if necessary, for implantation into a nonovulating woman.

The Committee on Medical Ethics of the Federation of Jewish Philanthropies of New York concluded that a fertilized egg not in the womb, but in an environment — the test tube — in which it can never attain viability, does not have humanhood and may be discarded or used for the advancement of scientific knowledge.³⁴ It should also be stressed that even in the absence of Jewish legal or moral objections to *in vitro* fertilization using the husband's sperm, no woman is required to submit to this procedure. The obligations of women, whether by reason of the scriptural exhortation to populate the universe or by virtue of the marital contact, are limited to bearing children by means of natural intercourse.³⁵

If and when medical science develops more advanced techniques of test-tube gestation, it may be necessary to reexamine these moral and legal questions. Herschler addresses the issue of a fetus incubated for its full gestation in a totally artificial womb or incubator without using either the natural mother or a surrogate mother's uterus.³⁶ Is such a child human when it is "born"? Although this creature may have the hereditary characteristics of its biological parents, humanhood is usually assumed to occur following natural conception, pregnancy, and birth through a woman's womb. Does the interruption of this natural process even for a short period, such as for *in vitro* fertilization, negate the humanhood of such an infant? Is such an infant to be considered as a *golem* (artificially created "human" being) or as an angel, neither of whom are conceived and born from a woman's womb, and neither of whom are included in the human race? If so, destroying them might not be considered an act of murder. Would the destruction of a baby "born" in an artificial womb or incubator without ever having been in a human uterus be an act of murder?

Herschler cites numerous sources, including the famous talmudic passage which describes a *golem*, and concludes that the latter is not

34. A COMPENDIUM ON MEDICAL ETHICS: JEWISH MORAL, ETHICAL AND RELIGIOUS PRINCIPLES IN MEDICAL PRACTICE (D. Feldman & F. Rosner, 6th ed. 1984).

35. Bleich, *Judaism and Healing*, *supra* note 31, at 88; Bleich, *Host Mothers*, *supra* note 31.

36. Herschler, *supra* note 31.

human but akin to a robot. On the other hand, a baby born after *in vitro* fertilization is derived from human seed, both egg and sperm, and matures and grows according to the laws of nature. Therefore, such a baby — even if totally gestated in an artificial womb — should be considered human with all the legal and moral responsibilities of a similar child born in the usual manner. Yet Herschler simultaneously concludes that destroying an infant that came into being outside a human uterus may not be legally considered an act of murder. Perhaps if someone had killed Adam, the first man in this world, he would not have been guilty of murder, because Adam was not born from a woman's womb but was created by Almighty God. The question, therefore, arises as to whether or not one is permitted to desecrate the Sabbath and other laws to save the life of such a zygote or fetus or baby born in an artificial incubator, just as one is so obligated in Jewish law for the usual fetus in its mother's womb.

Finally, in regard to *in vitro* fertilization, it may be possible to separate male-producing from female-producing sperm and thereby to predetermine the sex of one's baby, either by artificial insemination of male- or female-producing sperm or the use of the appropriate sperm to fertilize an egg in the test tube for reimplantation into the mother. Is such sex predetermination permissible in Jewish law? This subject is discussed in some detail elsewhere.³⁷ The freezing of human sperm and eggs for later use is another subject not yet adequately addressed by Jewish authorities.

The case of host motherhood in Jewish law concerns the implantation of a fertilized egg or tiny embryo into the womb of a woman other than the donor of the egg, perhaps because the true mother is unable to carry a fetus to term.³⁸ The host mother thus serves as a surrogate and "incubates" the fetus for the true mother. The fetus can either be transplanted from one mother to another or the egg and sperm are united *in vitro* in a test tube and directly implanted into the host mother. Another recent development is called adoptive pregnancy, in which a woman is artificially inseminated and within a week after conception, the embryo is flushed from her womb and transferred to another woman who carries it to term and "becomes the mother." There is a serious question in Jewish law whether or

37. Rosner, *Sex Determination as Described in the Talmud*, in *MEDICINE IN THE BIBLE AND THE TALMUD* 173-78 (1977); Rosner, *The Biblical and Talmudic Secret for Choosing One's Baby's Sex*, 15 *ISRAEL J. MED. SCIENCES* 894-98 (1979).

38. Herschler, *supra* note 31; Drori, *supra* note 31; Steinberg, *supra* note 31; Bleich, *Test Tube Babies*, *supra* note 31; Bleich, *Judaism and Healing*, *supra* note 31, at 92-95; Bleich, *Host Mothers*, *supra* note 31; *A COMPENDIUM ON MEDICAL ETHICS: JEWISH MORAL, ETHICAL AND RELIGIOUS PRINCIPLES IN MEDICAL PRACTICE* 51-52 (D. Feldman & F. Rosner, 6th ed. 1984); Rosenfeld, *supra* note 31.

not the biological mother is allowed to give up her child for transplantation into another "womb" and whether or not the host mother is allowed to accept it. What is the legal parenthood of the child? If a married woman becomes a host mother, then would Jewish law require her to abstain from sexual relations with her husband for ninety days, in order to ensure that the child is not his, that is to say, that she did not miscarry the implanted fetus and become pregnant by her husband? The husband would certainly not have to divorce his wife for serving as a host mother, since no act of adultery was committed.

Regarding the permissibility of host motherhood in Judaism, the Federation's Committee on medical Ethics states that such procedures are only permissible in the absence of an alternative and may not be resorted to by fertile parents who prefer the services of a host mother.³⁹ While the use of surrogate mothers for the convenience of couples able to have children cannot be condoned, an infertile couple may have recourse to a surrogate mother in the absence of alternatives "to save a marriage or bring happiness to the depressed." There should, of course, be absolute assurance that the surrogate is participating without coercion and with fully informed consent, and that the arrangement is protected by all necessary legal and social safeguards.

According to Britain's Chief Rabbi Immanuel Jakobovits, to abort a mother's naturally fertilized egg and to reimplant it in a host mother for reasons of "convenience for women who seek the gift of a child without the encumbrance and disfigurement of pregnancy is offensive to moral susceptibilities." Furthermore, says Jakobovits, "to use another person as an 'incubator' and then take from her the child she carried and delivered for a fee is a revolting degradation of maternity and an affront to human dignity."⁴⁰

In order to apply the laws pertaining to the firstborn, it is important to know whether the biological or the host mother is regarded as having given birth to the infant. If fetal transfer to a host mother is performed after forty days postconception, then Rosenfeld considers the child to be the legal offspring of its biological parents, since the child became "completed" while still in the biological mother's body, and she is regarded as having given birth to it.⁴¹ Jewish law may view differently the situation of fetal transfer prior to forty days after conception or *in vitro* fertilization followed by host motherhood.

39. A COMPENDIUM ON MEDICAL ETHICS: JEWISH MORAL, ETHICAL AND RELIGIOUS PRINCIPLES IN MEDICAL PRACTICE (D. Feldman & F. Rosner, 6th ed. 1984).

40. Jakobovits, *supra* note 29, at 261-66.

41. Rosenfeld, *supra* note 31, at 78-87.

Hershler states that the laws of genealogy are laws of the Torah and are not based on the laws of heredity or genetics.⁴² In Jewish law, a child is considered to be genealogically descended from its father. If the father is a priest or a Levite, so is the son. In genetics and heredity, continues Hershler, father and mother play equal roles, as it is written: *male and female did He create them*.⁴³ The Talmud states:

There are three partners in man: the Holy One, blessed be He, his father, and his mother. His father supplies the semen of the white substance out of which are formed the child's bones, sinews, nails, the brain in his head, and the white in his eye. His mother supplies the semen of the red substance out of which are formed his skin, flesh, blood, and the black of his eye. And the Holy One, blessed be He, gives him the spirit and the breath, beauty of features, eyesight, the power of hearing and the ability to speak and walk, understanding, and discernment.⁴⁴

Hershler also postulates that a baby born from a totally artificial womb may have no genealogical relationship to the biologic father. On the other hand, it may be logical to assume that the genealogical relationship is established immediately at the time of ejaculation during normal intercourse or at the time of *in vitro* fertilization, even long before the development of an embryo or fetus. The sperm itself establishes the filial relationship. Hershler cites several rabbinic sources to support the above views.

Finally, based on the biblical story of the birth of Dinah to Leah and the talmudic discussion thereon,⁴⁵ Hershler concludes that the maternity of the child is determined by the mother who nurtures and gives birth to the baby, not necessarily the biologic mother. Bleich expands on this subject by pointing out that the Talmud declares that Dinah was born a female as a result of Leah's prayers during her pregnancy.⁴⁶ Knowing that Jacob would become the father of a total of twelve sons, and not wishing her sister Rachel to bear their husband fewer sons than the maidservants Bilhah and Zilpah, Leah prayed that her already conceived fetus would be born a female. It is clear from the parallel narrative in the Palestinian Talmud,⁴⁷ continues Bleich, that the phenomenon described by the sages involved an *in utero* sex change. However, one biblical commentator states that

42. Hershler, *supra* note 31, at 307-20.

43. *Genesis* 5:2.

44. *Niddah* 31a.

45. *Genesis* 30:21; *Berachot* 60a.

46. Bleich, *Maternal Identity*, 19 TRADITION 359-60 (1981).

47. *Berachot* 9:3.

what transpired was not a sex change in Leah's fetus but a physical exchange of the fetus from the womb of Leah to the womb of Rachel, and vice versa, i.e., an embryo transfer.⁴⁸ Dinah was thus conceived by Rachel but transferred to the womb of Rachel. Bleich further points out that a talmudic commentary⁴⁹ asserts that this double embryo transfer is also the correct interpretation of the talmudic narrative.⁵⁰ Finally, Bleich cites an alternative rabbinic opinion which concludes that maternal relationship is established by conception rather than birth.

Bleich had earlier addressed the issue of maternal identity by citing a rabbinic responsum by Rabbi Y. A. Kamelher which discusses a case in which the ovary of a fertile woman was transplanted into the body of a previously barren woman to enable her to become pregnant and bear children.⁵¹ The same type of case was also discussed in two other rabbinic responsa cited by Bleich. Adultery is certainly not involved on the part of the recipient women even if the donor of the ovary was a married woman. The recipient of the ovarian transplant would probably be considered the legal mother of any child subsequently conceived and born because a transplanted organ is ordinarily deemed to become an integral part of the body of the recipient.

Another view cited by Bleich is that the ovary alone is an inert organ and incapable of reproduction were it not for the physiological contributions of the recipient. Furthermore, in the case of fetal transplantation, the host mother nurtures the embryo and sustains gestation and, perhaps, should be considered the legal mother of the offspring. According to other authorities, the donor mother alone may be viewed as the mother in the eyes of Jewish law, because the prohibition against feticide is applicable from the moment of conception. These authorities deem the fetus to be a human being with identity and parentage from the earliest stages of gestation. One can also raise the possibility of two maternal relationships existing simultaneously, the child thus having two mothers, the donor or biological mother and the host mother.

Jewish sources do not discuss testicular transplants, but similar principles would probably apply. The question of paternity in the case of a testicular transplant and maternity in the case of an ovarian transplant is related to the question discussed above of the parenthood of a fertilized egg or fetus implanted in a host mother. There may be a distinction between the transplantation of a sex or-

48. *Targum Yonatan* on *Genesis* 30:21.

49. Commentary of Rabbi Samuel Edels, on *Niddah* 31a (known as *Maharsha*).

50. *Berachot* 60a.

51. Bleich, *Judaism and Healing*, *supra* note 31, at 93; Bleich, *Host Mothers*, *supra* note 31.

gan and the transplantation of any other organ. The rule that a transplanted organ becomes an integral part of the body of the recipient may not apply to the implantation of a zygote or embryo into a host mother's womb or to the transplantation of ovary or testicle. Sperm and egg retain the full genetic identity of their donors. The process of fertilization whether *in vivo* or *in vitro* does not alter the genetic paternity or maternity of the eventual fetus. An "incubator mother" may not have maternal status. If it were possible for a full nine-month gestation to occur in an artificial incubator, then the artificial incubator would certainly not be considered to be the mother of the infant.

Because sperm is produced within the testicle, after the first ejaculation in a case of testicular transplant, the sperm are produced by the recipient rather than by the donor. Similarly, following an ovarian transplant, the nourishment and maturation of eggs within the ovary depend upon the recipient and not the donor. There may, however, be a difference between a testicular transplant, where the sperm are to be produced in the future, and an ovarian transplant, where the ovary already contains the primordial egg cells at the time of the transplant. A transplanted ovary is an organ which functions within the existing physiology of the recipient, whereas a transplanted testicle is more like germ-plasm which constitutes a reservoir of genetic material. However, one should note that a gamete maintains its own individuality and retains the genetic code of the donor without reflecting the genetic code of the recipient. Because of genetic constancy, the transplanted ovary or testes are not free of the donor. For example, if the donor is a carrier of a detrimental trait, such as hemophilia or Tay-Sachs disease, the trait might appear in the offspring.

Is there a difference in Jewish law between a testicular transplant from a random donor and one from an identical twin brother of the recipient, in which case the genetic material of the donor is identical to that of the recipient? The source of the donor also raises a specific Jewish legal issue; since castration is biblically prohibited except for the preservation of human life, must one resort nearly exclusively to the use of cadaver ovaries and testicles for transplantation?

The medical problems of removing the ovum, modifying some of its genes by microsurgical techniques, and replacing the viable ovum in the mother have not yet been surmounted. However, assuming such surgery can be successfully performed, Rosenfeld contends that gene surgery might be permissible in Jewish law because genes are submicroscopic particles and no process invisible to the naked eye

could be forbidden in Jewish law.⁵² Laws of forbidden foods do not apply to microorganisms. The priest only declares ritually unclean that which his eyes can see. On the other hand, a newborn infant with ambiguous genitalia would probably need a chromosome analysis (microscopic examination) to establish genetic sex.

Another argument for the permissibility of gene surgery is the fact that the ovum (or sperm) is not a person, because conception has not yet taken place. Thus, gene manipulation would not be considered as tampering with an existing human being but only with a potential one. Some authorities, however, would argue that the destruction of even a potential human being (either the unborn fetus or the unfertilized human seed) is prohibited in Jewish law.⁵³

Rosenfeld also argues that any surgery performed on a live human being must certainly be permitted on an ovum (or sperm) before conception. For example, if a surgical cure for hemophilia or Tay-Sachs disease were possible, it would surely be permissible; hence, it would certainly be permissible to cure hemophilia or Tay-Sachs disease by gene surgery.

If it were possible to transplant one or more genes of one person into the ovum or sperm of another, then the following Jewish legal questions would arise: Are gene transplants considered to be a type of perverted sex act between the gene donor and the recipient? Would such transplants be forbidden, in particular, if donor and recipient were close relatives? Would a child conceived from such a manipulated ovum or sperm be regarded as related to the gene donor? Can one draw parallels from the rabbinic responsa dealing with ovarian transplants and conclude that since no sex act is involved in a gene transplant, the recipient is not forbidden to marry the donor's relatives, and the child conceived and born following a gene transplant is not related to the gene donor? As already mentioned, in most organ transplants (kidney, cornea, heart, ovary, "gene") the organ becomes an integral part of the recipient.⁵⁴ The only exception may be the brain, since there is evidence to support the position that the legal identity of a person follows the brain.⁵⁵

52. Rosenfeld, *Judaism and Gene Design*, 13 TRADITION 71-80 (1972).

53. Rosner, *The Jewish Attitude Toward Abortion*, 10 TRADITION 48-71 (1968).

54. Rosner, *Organ Transplantation in Jewish Law*, in JEWISH BIOETHICS 358-74 (1979).

55. Rosenfeld, *The Heart, the Head and the Halakhah*, 70 N.Y. STATE J. MED. 2615-18 (1970).

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