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CANADIAN RESEARCH INSTITUTE
FOR THE ADVANCEMENT OF WOMEN

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Submission from
The Canadian Research Institute
for the Advancement of Women (CRIAW/ICREF)
to the
Canadian Royal Commission
on New Reproductive Technologies

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Table of Contents

EXECUTIVE SUMMARY

New reproductive technologies are now a significant force in Canada, both materially and psychologically. The belief in the possibility of a "technological fix" for reproductive problems has entered the Canadian consciousness. The Canadian Research Institute for the Advancement of Women (CRIAW) strongly believes that women's voices must direct the discussions concerning public policy and legislation. If new reproductive technologies are not strictly controlled, with women's voices and experiences as the guiding principles of all regulatory processes, women's seemingly increased choice will only further undermine their responsibility for their own reproductive processes. We therefore call for legislation that protects women's right to reproductive freedom and, at the same time, protects women from the dangers of over-medicalization that now accompany the practice of reproductive procedures in general and of new reproductive technologies in particular.

CRIAW's brief, in an attempt to rectify others' silence, consciously focuses on the impact of new reproductive technologies on women's lives, on women's bodies, and on the lives produced within women's bodies. It is imperative that we examine the effects of NRTs on women in terms of health, economic impact, legal implications and social consequences from a women-oriented perspective. In our brief we argue that even in the development of new reproductive technologies, where ostensible choice is enhanced, women's reproductive autonomy is, paradoxically, threatened. The following technologies, along with specific recommendations, are presented from a feminist perspective: *In vitro* fertilization, contract motherhood, genetic

engineering and embryo research, prenatal diagnosis and artificial insemination.

In light of our analyses we call for a reassessment of current priorities for research funding. Many of the new reproductive technologies are very expensive, psychologically draining, and dangerous methods of dealing with the problems of infertility. The World Health Organization estimates that for the cost of one live IVF baby, 100 women could be prevented from becoming infertile. Moreover, it has been estimated that more women become infertile from pelvic inflammatory disease in the United States in a month than have been successfully treated by *in vitro* fertilization worldwide. Rather than circumventing infertility with the application of expensive technologies we strongly feel that research funds need to be redirected into prevention of the related causes of infertility. (i.e. environmental factors, stress factors, contraceptive related factors and factors associated with sexually transmitted diseases.)

Finally, we stress the necessity of an environment in which reproductive technologies benefit rather than threaten women's status in Canada. In order for this to become a reality, women's interests must be central in all analyses, their voices heard in all discussions, and their participation sought in all organization of the new reproductive technologies in Canada.

1. Preface: CRIAW/ICREF

The Canadian Research Institute for the Advancement of Women (CRIAW/ICREF) was founded during International Women's Year in 1976 in response to a heightened awareness of the lack of Canadian research on women.

1.1 Structure

CRIAW/ICREF is a non-profit organization with approximately a thousand members from across the country. The Board of Directors, elected by the membership, works on a voluntary basis. Each province and territory elects a member and there are six directors-at-large. The Board and its various committees are assisted in their work by the National Office in Ottawa. CRIAW/ICREF, as a national organization, operates in both official languages.

1.2 Objectives

The objectives of CRIAW/ICREF are four-fold:

1) To promote the advancement of women through research;

2) To encourage and facilitate communication and information exchange among community workers, academic women, women's groups and concerned individuals;

3) To disseminate research results through publications such as the *CRIAW Papers*, *Feminist Perspectives Féministes* and conference proceedings; and

4) To sponsor and assist research in areas of vital interest to Canadian women.

The tendency of many researchers to ignore women's perspectives and experiences has had profound consequences for those institutions, governments, and organizations who rely on such research; their policies have tended to reflect the interests of Canadian men, and have therefore been inadequate in a society equally composed of men and women. CRIAW's research, focusing on women's experiences, plays a significant role in the planning and development of major social goals.[1]

2. Introduction: The Need to Focus on Women

New reproductive technologies are now a significant force in Canada, both materially and psychologically. The belief in the possibility of a "technological fix" for reproductive problems has entered the Canadian consciousness. It is our aim in this brief to demonstrate the enormous impact of the new reproductive technologies on women's lives and the corresponding importance of placing women's interests at the centre of this Commission's policy recommendations.

2.1 Towards a women-centred analysis

Because the lives of women are so personally affected by the new reproductive technologies, their voices must direct the discussions concerning public policy and legislation. If new reproductive technologies are not strictly controlled, with women's voice and experience as the guiding principles of all regulatory processes, women's seemingly increased choice will only further undermine their responsibility for their own reproductive processes and may ultimately threaten their status in Canadian society. A women-centred perspective on human reproduction explores and gives voice to women's experiences.

The contribution of a women-centred approach can best be understood in contrast to the perspective of most of the previous reports on new reproductive technologies. The Warnock Report and the Ontario Law Reform Commission both take a non-feminist approach to the issues.

A non-feminist approach takes the male perspective as the norm and is unaware of the different ways in which women may experience the world. It is not conscious of the narrowness of its focus, but instead assumes that its limited analysis is the only valid one. It therefore tends to focus on a very few issues and to ignore others that are equally or more important.[2] The British Warnock Report, for example, addresses the problems that *in vitro* fertilization poses for those who hold certain religious beliefs, for those who believe in the sanctity of embryos, and for those who are concerned about the cost of the program.[3] The report does not, however, address the problems that *in vitro* fertilization poses for the women whose health is at risk for the sake of a technology with an 87%-100% failure rate in Canada.[4]

A non-feminist perspective also tends to dismiss the reality of sexual inequality in our society. In doing so, it often reinforces women's subordination. Such a perspective ignores the potential of new reproductive technologies for undermining women's status. When examining surrogacy contracts, for example, the Ontario Law Reform Commission was almost exclusively concerned with paternity, custody, and the legal enforcement of the contracted mother's obligations.[5] The Commission's report did not seriously consider the possibility that commercial surrogacy might exploit both mother and child.

Although the Warnock and Ontario Law Reform Commission reports are significant precedents for the work of the Canadian Royal Commission, they fail to address many of the crucial issues surrounding the new technologies. We therefore urge a new kind of legislation that protects women's right to reproductive freedom and, at the same time, protects women from the dangers of over-medicalization that now accompany the practice of reproductive procedures in general and of new reproductive technologies in particular.

This brief will introduce a different analysis of new reproductive technologies by focusing on their impact on women. Women-centred perspectives have been most fully

developed in the literature of the feminist movement. Feminist analyses have revealed the enormous range of issues that are related to human reproduction and that are being fundamentally altered by the development of new reproductive technologies. A feminist perspective does not simply reverse the male bias of a non-feminist approach but seeks to reorient the dominant focus to include a range of issues that address women's reproductive experience. Our analysis therefore consciously focuses on the impact of new reproductive technologies on women's lives, on women's bodies, and on the lives produced within women's bodies in an attempt to rectify others' silence.

We will examine the impact of new reproductive technologies on women in a world in which women remain generally subordinate to men. We are also deeply concerned with the effect that the increasing use of technologies may have on children; we question those who argue that economic and social priority be given to new reproductive technologies in a country where almost one of every five families with children lives below the poverty line.[6] In approaching new reproductive technologies from a feminist perspective in this brief, we seek to refocus the limited scope of non-feminist analyses by examining the potential benefits and dangers that these technologies pose to Canadian women.

2.2 Elements of a women-centred approach

2.2.1 Effects on women

a) Health:

We are concerned by the considerable risks that the new reproductive technologies pose for women's physical and psychological health. These risks range from the discomfort of the batteries of tests routinely used to determine the cause of infertility, through the possibility of premature menopause and cancer caused by fertility drugs,[7] to the danger of the major surgery involved in *in vitro* fertilization.[8]

b) Economic impact:

Commercial interests have an enormous amount at stake in the development and practice of new reproductive technologies.[9] We fear that women and children may be reduced to a "use value" or "market price" if commercial interests are allowed to dominate the technological agenda; already Noel Keane, a pioneer of commercial surrogacy in the United States, has described children born through contractual arrangements as "investments."[10] We also question the economic burden that new reproductive technologies will place on the health care system given that there are other areas such as the prevention of infertility that should be given priority.

c) Legal implications:

We fear that the "fetus-as-patient" mentality which often accompanies new reproductive technologies endangers women's rights. In the United States, it has been argued that restrictions should be placed on pregnant women's activities and that mothers should be sued for "prenatal negligence";[11] in Canada also, women have been forcibly subjected to obstetric intervention.[12]

d) Social consequences:

The development of new reproductive technologies has an enormous impact on women's experience of maternity. We are concerned that the uncontrolled development of these technologies will increase women's dependence on medical intervention in pregnancy and birthing. In the more extreme technologies like *in vitro* fertilization and surrogate motherhood, women's maternal role is being divided into the separate functions of egg-

producer, uterus, and nurturer; this division separates and isolates parental roles, reducing reproduction to an assembly-line process.[13]

2.2.2 A reassessment of "choice"

Physicians do not practise the new reproductive technologies in a social vaccum. Nor do the effects of reproductive intervention stop when a woman leaves her doctor's office. They become a part of women's lives. In order to understand how the four main trends in new reproductive technologies listed above actually affect different women, we must examine them in the context of women's real lives.

Unfortunately, women still live within the context of sexual inequality in Canadian society. Women are economically disadvantaged, earning two-thirds what men earn.[14] Their work with adults and children at home and in the community continues to be undervalued. Women's social inequality has been traditionally reinforced through their lack of control over their bodies, particularly their reproductive processes. Social control over women's bodies has included the power of medical, legal, religious, and economic forces over women's reproduction. In contemporary Canadian society, we are witnessing a dramatic increase in medical intervention in reproduction. Even in the development of new reproductive technologies, where ostensible choice is enhanced, we will argue that women's reproductive autonomy is, paradoxically, threatened.

Women's experiences of new reproductive technologies depends on their class and ethnic background. While white middle class women are pressured to take advantage of new reproductive technologies, women of colour, native women, and poor women are discouraged from bearing children at all. As long as commercial reproductive clinics are allowed to operate, this inequality of access to new reproductive technologies can only increase.

The fact that new reproductive technologies enter women's lives within the context of already existing social pressures and prejudices further complicates their impact on women. The easy rhetoric of commercial clinics about "reproductive alternatives" and the "increased choice" offered by reproductive technologies rings false when women's "choices" are often motivated by necessity. Choice means very little when sophisticated procedures are too costly for most women, yet everyday technologies (like ultrasound and amniocentesis) are used whether they are medically indicated or not. While some women are now feeling pressured to undergo experimental prodecures, many women may be losing their option to choose not to undergo potentially dangerous "routine" procedures. In a society in which infertility remains a social stigma, motherhood is often presented as the only acceptable "choice." Women may feel compelled to attempt to become mothers regardless of the costs to their health.

In order for women to be substantively equal in Canada, they must control their own bodies. **Our recommendations in this brief are informed by our vision of a future in which women are able to make meaningful choices about new reproductive technologies. In order to choose, women require knowledge about new reproductive technologies and the freedom to make decisions without the intervention of detrimental commercial or social pressures. In order to achieve this future, women as the persons whose lives and bodies are *directly* affected must be the central figures in all discussion concerning the direction of new reproductive technologies.**

3. Specific Technologies

In examining the various new reproductive technologies our aim is to weigh the intended benefits of the technologies, particularly in reducing the pain of infertility and the possibility of disease, against the physical and social risks they pose for women; the recommendations that follow reflect our focus on the impact of reproductive technologies on women.

3.1 In vitro fertilization

3.1.1 Analysis

Women's experience of *in vitro* fertilization is most often one of pain and disappointment. Nevertheless, the media continue to focus on the rare successes and to represent *in vitro* fertilization as a miracle "cure." On closer scrutiny, *in vitro* fertilization's effects on women are very problematic.

a) Medical risk:

The health risks that *in vitro* fertilization poses for women can be serious: they include ovarian trauma, complications from general anesthetic, embolism, and five times the normal risk of ectopic pregnancy.[15] Brazil's celebration of Australian *in vitro* fertilization training ended with the televised death of the patient.[16]

The fertility drugs that women must take also pose problems. As well as suffering discomfort,[17] women risk severe adverse reactions to the drugs, including ovarian hyperstimulation syndrome, a sometimes fatal condition.[18] The long-term effects of fertility drugs are uncertain; however, recent studies, including a report by the World Health Organization, have indicated an increased risk of endometrial, cervical, ovarian, and breast cancer in women who have taken fertility drugs,[19] and a higher risk of abnormalities in the reproductive tracts of their daughters.[20]

b) Failure rate:

Even after having undergone invasive and dangerous medical treatment, women treated in *in vitro* fertilization programs face a very low success rate. Two clinics in Canada have closed because they did not achieve a single live birth.[21] After surveying Canadian IVF clinics, journalist Ann Pappert reported that the child "take-home rates" ranged from 0 to 13% depending on the clinic.[22] This figure is suspiciously high, considering that the estimate given in the 1988 report of the Ministère de la Santé et des Services sociaux in Quebec was 0 to 5%[23] and that the national rate in the United States is 4 to 5%.[24] Estimated at 10%, the number of women who become pregnant while on the waiting list for Canadian *in vitro* fertilization programs is higher than all but the best clinics' success rates.[25] These figures are all calculated on the basis of the number of live births per egg-retrieval cycle — a figure that reflects women's real aims in undergoing *in vitro* fertilization. Unfortunately, many clinics are far from honest in their reporting. Some advertize their rate of "chemical pregnancies" as successes despite the fact that as many as 42% of these pregnancies will *not* result in live births.[26]

c) Effects on children :

The problems caused by *in vitro* fertilization do not end for those few women who finally give birth to live babies. In an Australian study of *in vitro* fertilization, it was found that *in vitro* fertilization patients underwent three times the number of caesarean sections as the general population. Their babies were often born prematurely and suffered from low birth-weights. Even after standardization for maternal age, the number of perinatal deaths was twice the expected number.[27] *In vitro* fertilization babies also risked five times the

usual rate of spina bifida and seven times the usual rate of transposed major vessels of the heart.[28] Despite the claims of IVF researcher, Professor Carl Wood, *in vitro* fertilization clearly does not "improve on natural reproduction."[29]

d) Current climate:

The climate in which women are currently undergoing *in vitro* fertilization does not allow them to make autonomous informed decisions about their bodies.

In vitro fertilization is increasingly being used to treat infertility of unknown origin. Because in Canada couples are defined as infertile after only one year of intercouse without conception, they are being encouraged to seek highly medicalized treatment for problems that time may solve much more safely. Even more disturbing is the trend toward using *in vitro* fertilization for male infertility,[30] since less invasive procedures like artifical insemination by donor can be used if a woman is fertile. No woman should undergo the pain, the risk, and the stress of *in vitro* fertilization for the sake of her male partner's genetic link to their offspring.

Commercial groups are increasing their control over *in vitro* fertilization. When medical teams sell their technology to create companies like IVF Australia, they allow commercial interests to dominate public ones. This, in turn, reduces public input into the development of reproductive technologies. Eugenic notions of creating a "better human product" are also more likely where profit is the motivation. Several prominent American *in vitro* fertilization practitioners have warned that in order for private clinics to survive econmically they must be "cutting corners somewhere," reducing their research into the safety and the effects of *in vitro* fertilization on their patients.[31] In order to avoid a two-tiered medical system in which only middle- and upper-class women have access to reproductive technologies, commercial interests must be minimized. If *in vitro* fertilization can be proven to be safe after extensive research then clinics must be publicly funded.

A Toronto *Globe and Mail* survey of Canadian *in vitro* fertilization clinics found that clinics did not warn women of the risks involved in the procedure.[32] Clinics may also give misleading success rates or lead women to believe that they will quickly walk out with a baby.[33] One Canadian woman was unaware that she was being given hormones, thinking that the fertility drug, Clomid, was a benign stimulant. Another was assured of "conservative" treatment, and was then surprised to be told after surgery that she had had an ovary and a fallopian tube removed.[34] Encouraged by the glowing media stories and the often misleading reports of their doctors, many women undergo *in vitro* fertilization without knowing the risks or the high probability of failure involved.

3.1.2 **Recommendations**

We have been unable to resolve the ethical dilemma presented to us by the present practice of *in vitro* fertilization since the effects of its practice are medically unproven and possibly harmful; yet, as women, we are unwilling to deny individual women access. Granting this dilemma, we make the following recommendations:

- *In vitro* fertilization must be designated as still experimental and operated as a clinical trial; this follows the recommendations of the World Health Organization.[35] The following criteria would thus apply:[36]

    a) clear information on all aspects of *in vitro* fertilization must be given to the public, including the real success rate of present techniques; this figure

should be calculated for each clinic and should state the number of live, healthy babies delivered per egg-retrieval cycle;

b) women undergoing *in vitro* fertilization must be considered experimental subjects and provided with appropriate information on the medical risks to their own bodies and of the uncertain long-term effects on the potential fetuses;

c) *in vitro* fertilization must be funded from government health-research budgets as opposed to health-care budgets;

d) any *in vitro* fertilization practice must be considered within the public domain, subject to conditions established by public policy. By this we mean that the profit motive and the private clinic/practitioner should not be permitted;

e) centres authorized to conduct clinical trials must be regularly assessed;

f) the collection and reporting of data must be mandatory, including the long-term effects on the bodies of the women involved and on the health of the children born of the procedure.

3.2 Contract Motherhood

3.2.1 Analysis

Contract motherhood, or "surrogacy," in which a woman is contracted to bear a child for another couple or individual, is one of the most controversial of the new reproductive technologies. In the brief time that it has been publicized, it has already produced several highly exploitive situations: in Australia, Professor Carl Wood, an *in vitro* fertilization researcher, has suggested that brain-dead women be used as "surrogate" mothers.[37] In the United States, a Mexican woman was brought to California on the understanding that she would serve as a "surrogate" mother; she was not allowed to leave the contracting couple's house for nine months and was offered $1500 for her service.[38] These stories are extreme but revealing examples of the relationships created in surrogacy contracts.

a) Commercialization:

The exploitation involved in surrogacy arrangements is most obvious when commercial interests become involved. Commercial surrogacy contracts constitute a form of baby-selling; if the mother were merely providing the service of gestation, the mother and father would have equal rights to the child once the gestation was over and the child was born. The fact that many contracts stipulate that a reduced fee be paid to the mother if the product (her child) is "defective" makes it clear that gestation is merely a means to the end of a healthy baby. Third parties — lawyers, doctors, and agents — also profit from such arrangements, further reducing mother and child to investments. If fees are paid to contract mothers, poor women are much more likely to produce children for wealthier women. As early as 1984, a United States agency was considering importing Third World women to bear children without payment. The president of the company, John Stehura, explained that "[o]ften they're looking for a survival situation — something to do to pay for the rent and food."[39] The potential of commercial surrogacy contracts to exploit women, children, the poor, and those living in the Third World is already a reality.

b) Physical control:

To insure that the mother provides an appropriate environment for her "product," strict regulations are often placed on her diet, exercise, and intercourse with her male partner. The contracted mother may also be required to undergo medical treatment, including ultrasound, amniocentesis, and abortion, regardless of her wishes.[40] Her right to refuse medical treatment is thus denied by the contract. If surrogacy contracts are made legally enforceable, a dangerous precedent will be set for the rights of all pregnant women.[41]

Although personal surrogacy arrangements may not be inherently exploitive, any contract that regulates a woman's physical and social existence, denies her first claim on the child, or involves a monetary transaction undermines a woman's rights and must remain unenforceable.

3.2.2 **Recommendations**

Although the Ontario Law Reform Commission suggested enforcing surrogacy contracts, 11 of 16 special commissions set up in the United Kingdom, Western Europe, Japan, Australia, and New Zealand have opposed surrogacy.[42] We recommend that the commission do the same:

- Surrogacy contracts must be legislated as legally unenforceable, and the act of arranging commercial surrogacy arrangements must be made a criminal offence. This follows the recommendations of Quebec's Conseil du statut de la femme.[43]

- The advertisement of contract motherhood arrangements should be banned.

3.3 Genetic Engineering and Embryo Research

3.3.1 Analysis

Although genetic engineering techniques may offer solutions to some human medical problems they also have their negative side, since enough is now known about genetics to alter human society fundamentally.

a) Social impact:

In perceiving genetic engineers as being in complete control of human genetics, capable of solving problems even before they manifest themselves, we are likely to minimize and fail to fund research into the non-genetic causes of disability and disease. Scientists themselves, working within scientific models, may succeed in isolating and measuring genetic factors only by stripping away or ignoring the complex interaction among environmental, biological, and social causes, reducing problems to "multi-gene defects."[44] Embryo screening, for example, may result in demands for "perfection" in human beings. If we are willing to screen embryos or even manipulate them for certain characteristics, we may begin to expect a perfect child, but at a social cost impossible to evaluate or control.

b) Commercial control:

Genetic engineering benefits commercial interests more than any other reproductive technology. The U.S.S.R. has priorized biotechnology as an important source of economic growth;[45] the United States has become involved in a project to map the human genome for similar economic reasons;[46] and the European Economic Community is currently attempting to standardize all European countries' regulations on genetic engineering in the

interests of multinational corporations.[47] We are concerned that commercial interests may press genetic research further than public interest warrants.

c) Embryo research:

Embryo research is an aspect of genetic engineering that particularly troubles us. We do not wish to claim special human status for embryonic living material, but are concerned by the medical risk for women of embryo research. In order to produce embryos for research, women must provide the human ova. They must undergo the painful and dangerous procedures of fertility drugs and laparascopy, only producing a few fertilizable ova each time. The potential benefits of embryo research must therefore be carefully weighed against the risk involved for women's health.

We are concerned by the Canadian Medical Research Council's use of *in vitro* fertilization as a justification for allowing embryo experimentation. The Council argues that *in vitro* fertilization and embryo freezing have not been adequately researched because of ethical concerns about the experimentation involved.[48] We do not see the experimental nature of such procedures as *in vitro* fertilization as a justification for further contentious embryo research. Rather, it is a powerful argument for restricting the practice of *in vitro* fertilization.

Strict controls are necessary to insure that all embryo research and genetic engineering is ethically sound and socially beneficial.

3.3.2 **Recommendations**

- We disagree with the Canadian Medical Research Council's assertion that a voluntary Research Ethics Board is an appropriate forum in which to assess research involving genetic engineering or embryo experimentation.[49] Given the dangerous potential of unmonitored genetic research, we believe that strict controls are necessary. The problems faced by the British Voluntary Licensing Authority in enforcing its guidelines warn us about the ineffectiveness of voluntary peer regulation.[50] A national ethics board with statutory powers must therefore insure that all genetic engineering and embryo research is in the public interest.

- We support the Canadian Medical Research Council's concerns about the ethical implications of germ-line genetic engineering. We agree that genetic engineering should only be considered "where there is no reason to believe that the genetic alterations will be inherited, and only when long-term follow-up is an element of the research proposal."[51]

- In addition, the genetic screening of embryos before implantation in a woman's uterus (embryo biopsy) must be banned with the exception of cases where there is the possibility of severe genetic disorder.

- We further respond to the Canadian Medical Research Council's recommendations as follows:

  a) We agree that the creation of embryos *in vitro* for research as opposed to therapeutic purposes must be banned.[52] We stress that the risk to the woman donating the eggs far outweighs the potential benefits of research on the embryos obtained.

  b) We support the Council's statement that "the purpose of intended research is a critical element in deciding whether embryo research is

acceptable."[53] In addition, we stress that rather than concerning itself with the potential human life of the embryo, the ethics board must consider the impact of research on living Canadian women and men.

c) We believe that the ethics board, rather than favoring research into *in vitro* fertilization as the Council recommends,[54] should favor research into contraception and into other, less invasive forms of infertility treatment.

d) We are deeply concerned about the possible move to keep abortuses alive for the purposes of research; a woman who chooses to end her pregnancy also chooses to end the embryonic or fetal life. We therefore disagree with the Council's suggestion that "tissues from abortuses" be preferred to embryo tissue for research.[55]

e) We are uncomfortable with the Council's statement that "In time . . . investigators might contemplate other embryo research for such purposes, for example, as genetic correction."[56] This statement leaves open the possibility of gradually reducing the social and ethical criteria for permitting embryo research. We believe that such research must continue to be carefully screened to insure that it is truly in the public interest.

- We support the Canadian Law Reform Commission's recommendations that:

  a) "experimentation on embryos should be prohibited after the fourteenth day of embryonic development";[57]

  b) "the re-implantation of embryos that have been used for experimental purposes should be prohibited and subject to criminal penalty."[58]

- The treatment of embryos, like all other human genetic material, must be similar to the treatment of blood by the Canadian Red Cross. The donation of an embryo should be considered as a gift.

3.4 Prenatal diagnosis

3.4.1 Analysis

Prenatal diagnosis, which includes ultrasound, amniocentesis, chorionic biopsy and other methods, is welcomed by many for expanding women's choices by increasing their knowledge of their pregnancies. These technologies are seen to free older women and those who risk giving birth to a disabled child to become pregnant while being informed of the health of their fetuses. This positive perception has no doubt contributed to the dramatic increase in the use of prenatal diagnosis in Canada in the last decade.[59] The rapid development of these technologies must, nonetheless, be critically examined. Prenatal diagnostic techniques are altering women's experience of maternity and have the potential to transform into eugenic practices.

a) Medical risk:

We rarely hear about the risks that prenatal technologies pose to the health of women and their fetuses. Ultrasound is commonly seen as innocuous, and is therefore used simply to "see the baby" or to discover its sex. However, it has not yet been proven that the routine use of ultrasound in any way improves the development of pregnancies.[60] Moreover, several studies on the effects of ultrasound waves on animals and on fetal cells indicate that they may cause certain abnormalities.[61]

Amniocentesis poses real health risks for both mother and fetus. These dangers include fetal injury (1%), problems in the mother (0.5%), and an increased chance of complications during labor. One of every 200 women undergoing amniocentesis will suffer a spontaneous abortion.[62]

Chorionic biopsy is a technology that has only recently passed the experimental stage. Research into its effects is urgently needed.

b) Sex selection:

The social impact of prenatal diagnosis is clearest in the chance it offers for selecting the sex of a child. In India amniocentesis and abortion are being used as a form of sex selection; one sampling of 8,000 abortions following amniocentesis in 1986 revealed that 7,999 — all but one — were performed on female fetuses.[63] Sex selection through embryo screening is already being practiced in conjunction with *in vitro* fertilization in Britain.[64] There is also a sex preselection clinic in Toronto that separates sperm before insemination and offers a 75% chance to have a boy.[65]

Although choosing the sex of a child may appear to be an expression of individual freedom, it does have serious social consequences, particularly for women. Boys are preferred worldwide as single or firstborn children.[66] Standardization of sex selection would result in a society of second-born, even greatly outnumbered women. Studies have shown that either outcome would threaten women's status.[67] The philosophy behind sex selection is questionable in itself: what is more sexist than choosing a child purely on the basis of its sex? By increasing our emphasis on the importance of sexual difference, we can only create more rigid gender roles for men and women.

The technological developments that allow doctors to screen fetuses progressively earlier do not solve the ethical problems posed by prenatal diagnosis. They only make eugenic decisions easier to make and more difficult to avoid.

c) Effects on women:

As medical control over reproduction increases, women's intimate knowledge of the progress of their pregnancies becomes secondary to the picture on the screen or the cells under the microscope. By focusing on the fetus, these techniques separate the close connection between the mother and her fetus. Prenatal diagnosis treats the fetus as a separate patient and therefore risks undermining pregnant women's rights to refuse medical intervention into their bodies. If prenatal diagnosis is taken for granted, the choices that it offers women may become obligations. Women may be pressured to abort or to allow surgery on all but "perfect" fetuses; if they refuse, they may face "wrongful life" litigation from their offspring.[68]

3.4.2 **Recommendations**

- Women must give their written informed consent before they undergo ultrasound, amniocentesis, or chorionic biopsy; both oral and written explanations of the possible risks must be given to women prior to testing.

- Prenatal technologies should be restricted to cases where they are either medically indicated or requested by women after they have been fully informed of all possible risks.

- Sex selection must be banned with the exception of cases where there is a possibility of severe sex-linked genetic disorder.

3.5 Artifical Insemination

3.5.1 Analysis

Artificial insemination is one of the least invasive of the reproductive technologies. Although it is included under the category of "new" technologies, it has been practised for centuries. Today, although donor insemination is praticed widely in Canada,[69] it remains controversial and its practice is often shrouded in secrecy. We must create an open and safe environment in which artificial insemination is socially acceptable and accessible to women.

a) An end to anonymity:

The secrecy involved in donor anonymity is not healthy for the child. Although a 1981 report from Health and Welfare Canada argued that donor anonymity should continue,[70] it has since become increasingly obvious that individuals have a right to know their own origins. The information now available to adopted children should also be accessible to children born through artificial insemination. Access to their biological fathers' medical history may be vital for the health of these children; access to their cultural background is vital for their self-identity. Sweden has put an end to donor anonymity, and has done so in the interest of the child. Although Swedish doctors found that the number of donors decreased at first, it soon began to increase again; moreover, different kinds of donors began to volunteer, often men with their own children.[71] Lifting the veil of secrecy that surrounds artificial insemination is in the interests of the child and of an open society.

b) An end to commercialization:

The spread of artificial insemination has led to the establishment of commercial sperm banks in the United States. If we allow this to occur in Canada, we may begin to reduce the value of human reproductive material to a "market price." If commercial interests dominate the distribution of donated semen, we run the risk of developing the eugenic practice of selecting "superior" samples for insemination, as, for example, the Nobel Prize winners' sperm bank in the United States.[72] Moreover, it would be easier to insure the testing of all semen for disease if sperm banks were publicly owned and controlled. Semen, like embryos, must be a gift, not a commodity that can be bought and sold.

c) Reduced medicalization:

Unfortunately, there is a current trend towards over-medicalizing artificial insemination. Despite the disturbing list of dangers associated with fertility drugs, many doctors are increasing their use of drugs for the convenience of timing ovulation more exactly in order to fit the inseminations into their work schedules.[73] The simple practice of artificial insemination should not be made dangerous to women for the sake of speed or convenience. On the other hand, testing sperm for sexually transmitted diseases, including the AIDS virus, should become mandatory. This would require the use of frozen semen, which has been shown to be as effective as fresh semen in artificial insemination.[74]

d) Access for women:

Artificial insemination must be available to women from all backgrounds. The reports from bodies such as the Warnock and the Saskatchewan Law Reform commissions have tended to restrict access to artificial insemination to established heterosexual couples.[75] However, the nuclear family is no longer the statistical norm in Canada.[76] A variety of family structures, including single parented and extended families, make up the social fabric of our country. Given this diversity, the interests of a child conceived through artificial insemination cannot be judged on the basis of the race, class, marital status, or sexual preference of the prospective parents.

3.5.2 **Recommendations**

• We are concerned about the way in which the current trend towards exclusive medical control of artifical insemination by donor (AID) has led to the placing of non-medical restrictions on women's access. There should be no discrimination on the basis of class, race, marital status, or sexual orientation.

• There must not only be an end to the anonymity of donors but also protection for women against future "paternity" claims from semen donors who have not acted as parents. This will entail 1) the establishment of centralized records on donors and 2) access to this information for children once they reach the age of majority.

• Semen donors should not be paid. Instead, the treatment of semen should be similar to the treatment of blood by the Canadian Red Cross: the donation of semen must be considered as a gift.

• Donated semen must be frozen for testing against disease, especially the AIDS virus.

4. Organization and Regulation

Our recommendations for the organization of new reproductive technologies are based on our conception of a positive environment for assessing and regulating the new reproductive technologies:

a) While we recognize that healthcare is delivered provincially, both the practice and the researching of new reproductive technologies should be organized and regulated within a national framework.

b) The day to day practice of reproductive technologies should be locally based and controlled by women and men who accept the guiding principles of this brief.

c) Reproductive technologies should be seen as being part of the much larger process of reproduction.

4.1 **Recommendations:**

• Publicly funded, locally-based reproductive clinics should be established to offer information and counselling on all aspects of reproduction and to practise those reproductive technologies established as legal. These clinics would offer services for birth control (in this capacity they would connect with or incorporate Planned Parenthood), adoption, infertility counselling and treatment, abortion, hormone replacement therapy, treatment of sexually transmitted diseases and menstrual disorders, and birthing. Women must play a central role in the planning, regulation, and implementation of these reproductive clinics.

• Health and Welfare Canada should establish a bank of basic statistical data that is readily available to the public. The data should examine all meaningful aspects of the new reproductive technologies, including realistic rates of success and failure. Health and Welfare Canada should also promote research of a long-term nature, ensuring both public access to information and, at the same time, protection of individuals' privacy.

• A centralised bank of information on sperm donors should be established.

5. Infertility: New Priorities for Research Funding

5.1 Toward a more comprehensive analysis of infertility

Circumventing infertility is one of the most highly touted social benefits of the new reproductive technologies; however, the problem of infertility itself is rarely adequately addressed. "Infertility" is defined in Canada as a couple's inabililty to conceive after one year of regular intercourse, whereas "sterility" is defined as an individual's incapacity to procreate or to reproduce her or himself.[77] Many advocates of reproductive technologies present infertility as a biological disease which must necessarily be "cured" by medical and scientific experts.[78] This presentation is misleading since the label "infertile" depends on an arbitrary time limit; the World Health Organization, for example, places the limit at two years.[79] The Canadian limit of one year is particularly short. One study of *fertile* women in a Boston obstetrics ward concluded that 24 months after they had stopped using contraceptives, 10% of the women had not become pregnant but eventually conceived without intervention nonetheless.[80] The current Canadian definition of infertility therefore encourages perfectly normal couples to view themselves as diseased and in need of unnecessary technological intervention.

Many of the new reproductive technologies are very expensive, psychologically draining, and dangerous methods of dealing with the problem of infertility; the estimated cost in 1987 of a live IVF baby in Canada was $35,000 — a figure that does not include the additional expenses incurred from the higher number of neonatal problems among IVF babies.[81] Preventing infertility in the first place is therefore preferable. The causes of infertility, although inadequately researched, suggest some possible areas for directing preventative measures:[82]

a) Contraceptive history:
Certain studies indicate that different forms of contraception influence the rate of infertility: the intrauterine device (IUD) increases the risk of pelvic inflammatory disease, and therefore infertility, while barrier methods actually decrease this risk.

b) Sexually transmitted diseases:
Gonorrhea and Chlamydia, particularly prevalent among teenagers and young adults (15-24 years), both increase the risk of infertility; the spread of Chlamydia is of particular concern, since it is now more prevalent than Gonorrhea without being recognized as dangerous by most people.[83] The regular use of barrier methods of contraception would greatly reduce the spread of these sexually transmitted diseases.

Preventative programs should be aimed at educating the public about the causes of infertility and increasing the availability of barrier methods of contraception. Young people, who are most at risk, should be a primary target of these programs, and should be made aware of the dangers of sexually transmitted diseases and of the protection provided by barrier methods of contraception.

It has been estimated that more women become infertile from pelvic inflammatory disease in the United States in a *month* than have been successfully treated by *in vitro* fertilization worldwide. Moreover, if condoms were used by only 4% of the population at risk, the incidence of pelvic inflammatory disease would steadily decrease.[84] The advantages of prevention over treatment include a reduction in the psychological and social strains of highly medicalized treatments and an increase in community participation in the organization of preventative programs. Dollar for dollar, the very conservative cost-benefit analysis of the Canadian Advisory Council on the Status of Women demonstrates that

preventative programs would release funds should they prove effective in reducing sexually transmitted disease rates.[85] The World Health Organization estimates that for the cost of one live IVF baby, 100 women could be prevented from becoming infertile.[86]

c) Other causes of infertility:

Over 19% of Canadian infertility is unexplained.[87] Further research into the effects of contraception and sexually transmitted diseases on infertility is clearly necessary. Morevoer, almost no research exists into the contributions of diet, smoking and environmental pollution to infertility. The recently documented link between extremely high miscarriage rates and pollution in some parts of Poland suggest that fertility is, indeed, influenced by environmental factors.[88]

One of the most common causes of infertility is the variation in women's ovulatory cycles. The normal mentrual cycle is much more variable than is generally realized. In a recent year-long prospective study, only 13 of the 66 women observed had normal ovulatory cycles for the entire year.[89] Recent studies have indicated that these variations are influenced by factors such as stress[90] and undernutrition[91] (see Table 1).[92]

Table 1. Modulators of reproduction.

Enhancers	Suppressors
Nutrition	
>105 but <125% of IBW*	>125% IBW <59% of IBW*
Refeeding	Acute weight loss
Gynaecological	
	<9 or >35 years
Others	
¶ Regular sexual activity	† Conditioning exercise
‡ Close contact with cycling woman	† Emotional distress
§ Light cycle	† Physical illness
	Lactation
	Hyperprolactinaemia
	Narcotic use
	‖ Sleep disruption

* Ideal body weight (IBW) is a theoretical ideal weight, and a proportion of fat and muscle for a given heredity and frame size. Obesity is associated with androgen excess in women and hypogonadism in men.
† Nutritional changes are almost inevitable.
‡ True for women, ? effect for men.
§ Increasing light for women (spring), decreasing light for men (fall) with reference to the Northern Hemisphere (Ronkainen, 1985b).
¶ May relate to pheromones or central activation.
‖ A common factor in physical illness and emotional distress.

Women and their physicians tend to prefer technologically complex forms of diagnosis and treatment which may not reveal these subtle causes of infertility. For example, it does not make sense to see if the Fallopian tubes are patent by an expensive test which exposes the woman to radiation and other risks and discomforts when ovualation has not been established. Yet this commonly occurs in the clinical practice of gynecology.[93] Old fashioned tools like basal temperature analysis have now been make quantitative and have been validated against hormonal markers.[94] Highly technological solutions to infertility are unnecessary for many women.

By way of illustration, endocrinologist and medical pratitionner, Jerilynn Prior, recounts the experiences of an acquaintance of hers. The woman is in her first marriage, but her husband has been married before. He is frequently laid off, reducing their income

to her low-paying bank or clerking job. Her husband has had a vasectomy reversal but his sperm count is still low. After three years of marriage without pregnancy, the woman begins to see a gynecologist. He has her plot her basal temperature but does not analyse it other than by eye and places her on a program of donor insemination. After nine months of unsuccessful donor insemination, she feels that she was a failure and stops. Because she lives in the interior of B. C., the treatment has demanded both the cost of the procedure itself and her travel time and expense. Dr. Prior suggests that there are at least three reasons for the failure of the donor insemination:

- She felt very ambivalent about having a child when her husband had difficulty supporting her, either emotionally or finacially.
- She was stressed and significantly underweight.
- Her donor inseminations were not tied to her own hormonal cycles but were at the convenience of the physician.

Before resorting to highly technological treatments, women should be taught to understand their own reproductive changes, to diagnose them, and to then modify their lifestyles to decrease stress so that their fertility chances are optimal.[95]

Unfortunately, while public funding is currently being invested in biomedical engineering, very little money is being made available for research into the causes and alternative means of dealing with infertility: in the same year that the Canadian government spent $3.5 million on basic new reproductive technology research, only slightly over $400,000 was spent on public health and health services research related to reproductive disorders.[96] We urge the Commission to examine this situation and to redirect badly needed research funding into the prevention of infertility.

5.2 **Recommendations**

- Research funding must be redirected into the following areas:

  a) research into the environmental, sexually transmitted disease-related, and contraceptive-related causes of infertility;

  b) research into the long-term effects of all reproductive technologies, including the "everyday" prenatal technologies and fertility drugs;

  c) research into safer forms of contraception;

  d) research into effective male contraception and into the causes of male infertility;

  e) research into the rates of infertility for women from different socio-economic and ethnic backgrouds in Canada (in the United States poor women and women of colour are more likely to be infertile but less likely to seek medical help).[97]

- Funding must also be made available for:

  a) an effective screening program for gonorrheal and chlamydial diseases in order to detect asymptomatic disease;

  b) a community-based educational campaign to inform the public of the dangers of the lesser-known sexually transmitted diseases such as Chlamydia and to promote the perception of women as autonomous

decision-makers in sexual matters; this campaign must include educational programs in all schools.

- The initial evaluation of an infertile couple should include at least two sperm counts and the documentation of ovulatory function. Six months of continuous monitoring of basal temperature (or possibly salivary progesterone) and a menstrual cycle symptom diary are necessary before one would have adequate data to decide that abnormal ovulatory function was not the cause for infertility. Standards for these assessments of male and female fertility need to be met before any invasive procedures are performed.[98]

- Chlamydia and pelvic inflammatory disease should be nationally reportable diseases.

- The definition of infertility should be changed so that it is defined as the inability to conceive a viable pregnacy after a minimum of 2 years of regular intercourse.

6. Conclusion

We acknowledge the benefits that some of the new reproductive technologies offer women in their struggle to cope with infertility and to reduce the chance of giving birth to a severely disabled child. However, we have grave concerns about the exploitive potential of certain technologies like "surrogacy" and *in vitro* fertilization. We also fear that the increasing trend towards medicalizing reproduction, which is reflected in the development of reproductive technologies, is steadily reducing women's control over their own bodies.

We must create an environment in which reproductive technologies benefit rather than threaten women's status in Canada. In order for this projection to become a reality, women's interests must be central in all analyses, their voices heard in all discussions, and their participation sought in all organization of the new reproductive technologies in Canada.

7. Summary of Recommendations

7.1 *In vitro* fertilization

We have been unable to resolve the ethical dilemma presented to us by the present practice of *in vitro* fertilization since the effects of its practice are medically unproven and possibly harmful; yet, as women, we are unwilling to deny individual women access. Granting this dilemma, we make the following recommendations:

- *In vitro* fertilization must be designated as still experimental and operated as a clinical trial; this follows the recommendations of the World Health Organization. The following criteria would thus apply:

  a) clear information on all aspects of *in vitro* fertilization must be given to the public, including the real success rate of present techniques; this figure should be calculated for each clinic and should state the number of live, healthy babies delivered per egg-retrieval cycle;

  b) women undergoing *in vitro* fertilization must be considered experimental subjects and provided with appropriate information on the medical risks to their own bodies and of the uncertain long-term effects on the potential fetuses;

  c) *in vitro* fertilization must be funded from government health-research budgets as opposed to health-care budgets;

  d) any *in vitro* fertilization practice must be considered within the public domain, subject to conditions established by public policy. By this we mean that the profit motive and the private clinic/practitioner should not be permitted;

  e) centres authorized to conduct clinical trials must be regularly assessed;

  f) the collection and reporting of data must be mandatory, including the long-term effects on the bodies of the women involved and on the health of the children born of the procedure.

7.2 Contract motherhood

Although the Ontario Law Reform Commission suggested enforcing surrogacy contracts, 11 of 16 special commissions set up in the United Kingdom, Western Europe, Japan, Australia, and New Zealand have opposed surrogacy. We recommend that the commission do the same:

- Surrogacy contracts must be legislated as legally unenforceable, and the act of arranging commercial surrogacy arrangements must be made a criminal offence. This follows the recommendations of Quebec's Conseil du statut de la femme.

- The advertisement of contract motherhood arrangements should be banned.

7.3 Genetic engineering and embryo research

• We disagree with the Canadian Medical Research Council's assertion that a voluntary Research Ethics Board is an appropriate forum in which to assess research involving genetic engineering or embryo experimentation. Given the dangerous potential of unmonitored genetic research, we believe that strict controls are necessary. The problems faced by the British Voluntary Licensing Authority in enforcing its guidelines warn us about the ineffectiveness of voluntary peer regulation. A national ethics board with statutory powers must therefore insure that all genetic engineering and embryo research is in the public interest.

• We support the Canadian Medical Research Council's concerns about the ethical implications of germ-line genetic engineering. We agree that genetic engineering should only be considered "where there is no reason to believe that the genetic alterations will be inherited, and only when long-term follow-up is an element of the research proposal."

• In addition, the genetic screening of embryos before implantation in a woman's uterus (embryo biopsy) must be banned with the exception of cases where there is the possibility of severe genetic disorder.

• We further respond to the Canadian Medical Research Council's recommendations as follows:

a) We agree that the creation of embryos *in vitro* for research as opposed to therapeutic purposes must be banned. We stress that the risk to the woman donating the eggs far outweighs the potential benefits of research on the embryos obtained.

b) We support the Council's statement that "the purpose of intended research is a critical element in deciding whether embryo research is acceptable." In addition, we stress that rather than concerning itself with the potential human life of the embryo, the ethics board must consider the impact of research on living Canadian women and men.

c) We believe that the ethics board, rather than favoring research into *in vitro* fertilization as the Council recommends, should favor research into contraception and into other, less invasive forms of infertility treatment.

d) We are deeply concerned about the possible move to keep abortuses alive for the purposes of research; a woman who chooses to end her pregnancy also chooses to end the embryonic or fetal life. We therefore disagree with the Council's suggestion that "tissues from abortuses" be preferred to embryo tissue for research.

e) We are uncomfortable with the Council's statement that "In time . . . investigators might contemplate other embryo research for such purposes, for example, as genetic correction." This statement leaves open the possibility of gradually reducing the social and ethical criteria for permitting embryo research. We believe that such research must continue to be carefully screened to insure that it is truly in the public interest.

• We support the Canadian Law Reform Commission's recommendations that:

a) "experimentation on embryos should be prohibited after the fourteenth day of embryonic development";

b) "the re-implantation of embryos that have been used for experimental purposes should be prohibited and subject to criminal penalty."

• The treatment of embryos, like all other human genetic material, must be similar to the treatment of blood by the Canadian Red Cross. The donation of an embryo should be considered as a gift.

7.4 Prenatal diagnosis

• Women must give their written informed consent before they undergo ultrasound, amniocentesis, or chorionic biopsy; both oral and written explanations of the possible risks must be given to women prior to testing.

• Prenatal technologies should be restricted to cases where they are either medically indicated or requested by women after they have been fully informed of all possible risks.

• Sex selection must be banned with the exception of cases where there is a possibility of severe sex-linked genetic disorder.

7.5 Artificial insemination

• We are concerned about the way in which the current trend towards exclusive medical control of artifical insemination by donor (AID) has led to the placing of non-medical restrictions on women's access. There should be no discrimination on the basis of class, race, marital status, or sexual orientation.

• There must not only be an end to the anonymity of donors but also protection for women against future "paternity" claims from semen donors who have not acted as parents. This will entail 1) the establishment of centralized records on donors and 2) access to this information for children once they reach the age of majority.

• Semen donors should not be paid. Instead, the treatment of semen should be similar to the treatment of blood by the Canadian Red Cross: the donation of semen must be considered as a gift.
• Donated semen must be frozen for testing against disease, especially the AIDS virus.

7.6 Organization and Regulation

• Publicly funded, locally-based reproductive clinics should be established to offer information and counselling on all aspects of reproduction and to practise those reproductive technologies established as legal. These clinics would offer services for birth control (in this capacity they would connect with or incorporate Planned Parenthood), adoption, infertility counselling and treatment, abortion, hormone replacement therapy, treatment of sexually transmitted diseases and menstrual disorders, and birthing. Women must play a central role in the planning, regulation, and implementation of these reproductive clinics.

• Health and Welfare Canada should establish a bank of basic statistical data that is readily available to the public. The data should examine all meaningful aspects of the new reproductive technologies, including realistic rates of success and failure. Health and Welfare Canada should also promote research of a long-term nature, ensuring both public access to information and, at the same time, protection of individuals' privacy.

• A centralised bank of information on sperm donors should be established.

7.8 Research priorities

• Research funding must be redirected into the following areas:

a) research into the environmental, sexually transmitted disease-related, and contraceptive-related causes of infertility;

b) research into the long-term effects of all reproductive technologies, including the "everyday" prenatal technologies and fertility drugs;

c) research into safer forms of contraception;

d) research into effective male contraception and into the causes of male infertility;

e) research into the rates of infertility for women from different socio-economic and ethnic backgrouds in Canada (in the United States poor women and women of colour are more likely to be infertile but less likely to seek medical help).

• Funding must also be made available for:

a) an effective screening program for gonorrheal and chlamydial diseases in order to detect asymptomatic disease;

b) a community-based educational campaign to inform the public of the dangers of the lesser-known sexually transmitted diseases such as Chlamydia and to promote the perception of women as autonomous decision-makers in sexual matters; this campaign must include educational programs in all schools.

• The initial evaluation of an infertile couple should include at least two sperm counts and the documentation of ovulatory function. Six months of continuous monitoring of basal temperature (or possibly salivary progesterone) and a menstrual cycle symptom diary are necessary before one would have adequate data to decide that abnormal ovulatory function was not the cause for infertility. Standards for these assessments of male and female fertility need to be met before any invasive procedures are performed.

• Chlamydia and pelvic inflammatory disease should be nationally reportable diseases.

• The definition of infertility should be changed so that it is defined as the inability to conceive a viable pregnacy after a minimum of 2 years of regular intercourse.

Notes

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[4] Ann Pappert, "Success rates quoted by *in vitro* clinics not what they seem," *The Globe and Mail* 8 Feb. 1988: A3.

[5] *Report on human artificial reproduction and related matters* . Ontario Law Reform Commission, Ministry of the Attorney General (Ontario: 1985) 218-273.

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[16] Judith N. Lasker and Susan Borg, *In Search of Parenthood, Coping with Infertility and High- Tech Conception* (Boston: Beacon Press, 1989) 70.

[17] Françoise Ouelette-Romaine has recorded the discomfort suffered by women undergoing *in vitro* fertilization in Quebec clinics.
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[33] Gena Corea records the expectations of the women involved in the early *in vitro* fertilization attempts. Many of the couples did not realize that "test-tube babies" had never yet been born. Corea 167-169.

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[46] Corea Gena and Cynthia de Wit, "Current Developments and Issues: a Summary." 1.2 198-203.

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[53] Medical Research Council of Canada 34.

[54] Medical Research Council of Canada 35.

[55] Medical Research Council of Canada 34.

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[58] Law Reform Commission of Canada 52.

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Lise Dunnigan et al, *Le Diagnostic Prénatal: Recherche et Recommandations* Conseil du statut de la femme, Gouvernement du Québec (Août 1987) 35, 15-16.

[60] Statement by the American College of Obstetricians and Gynecologists.
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Boston Globe. 22 July 1987.
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"Scientists Zero in on Sex-determining Gene," *Globe and Mail* 19 July 1990.

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66 Nancy E. Williamson, *Sons or Daughters: A Cross Cultural Survey of Parental Preferences* (Newbury Park, Calif.: Sage Publications, 1976).

67 Nancy E Williamson, "Sex Preferences, Sex Control, and the Status of Women," *Signs* 1 (1976): 847-862.

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