

NEW REPRODUCTIVE TECHNOLOGIES: NEWS FROM FRANCE AND ELSEWHERE

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Synopsis – France is one of the Western countries in which the development of NRTs – and specially in vitro fertilization (IVF) – is most important, spectacular, and rapid. But the interests of the NRT's practitioners are far from being those of women wanting to have a child.

Thus, the practitioners generally do not say how low the success rates are, even in the best centers. Instead of measuring success rates by the number of deliveries per attempt, they use different ways to present their results: ways that are much more favorable for them.

Furthermore, in order to increase the reproductive market, there is a trend to declare “infertile” and treat as such many women who are only “hypofertile.” Among the new indications being used for NRTs, IVF (which was first used for female infertility) is now prescribed sometimes as a treatment for male infertility. Thus this risky method is applied to the fertile women whose husband is infertile.

Apart from the risks of egg retrieval for women, one must add those associated with hormonal stimulations. To be more precise, new drugs are being tested on large numbers of women: even if they don't increase their chances of having a baby, they do allow the doctors to retrieve a very great number of eggs (which are very important as raw material for experiments), and they certainly do increase the risks for women.

To conclude, the NRTs present many advantages for the practitioners: they enable them to make profits; they also provide a very competitive field of research, which gives some scientists and doctors the opportunity to become very well known. The amount of research and the number of scientific articles and symposia are increasing at an amazing rate.

From this point of view, women are the best “guinea pigs”: unlike animals, they are intelligent, able to observe the effects of the treatments, they talk with the doctors, and ... they pay for that.

Synopsis – La France est l'un des pays occidentaux où le développement des Nouvelles Technologies de la Reproduction (NTR) et notamment de la Fécondation In Vitro (FIV) est le plus important, le plus rapide et le plus spectaculaire.

Or les intérêts des scientifiques et des médecins pratiquant les NTR sont loin d'être les mêmes que ceux des femmes désirant avoir un enfant.

Ainsi n'est-il pas dit que les taux de succès, y compris dans les meilleurs centres sont extrême-ment faibles. Alors que ces taux devraient être calculés en nombre d'accouchements (ou de bébés) par tentative, les praticiens de la FIV utilisent d'autres modes de “présentation” beaucoup plus avantageux.

Afin d'élargir le marché de la FIV, on déclare “stériles” des femmes qui ne sont qu' “hypofertiles”;

On élargit les indications de la FIV, y compris aux femmes fertiles dont le mari est stérile.

Outre les intérêts financiers impliqués dans ce qui est un marché de la procréation, les NTR constituent un champ de recherche fort compétitif et prometteur pour se faire un nom et une carrière de scientifique: le nombre de recherches, publications, colloques, ne cesse de croître. De ce point de vue, les femmes sont les “meilleurs” objets de recherche possible, car, à la différence des animaux, elles parlent, observent et ... paient.

Aux dangers des prélèvements ovocytaires, s'ajoutent ceux résultant de nouvelles méthodes de stimulation hormonale. Testées sur de nombreuses femmes, de nouvelles molécules dont les effets n'améliorent pas nécessairement l'obtention des bébés, mais plutôt le nombre des ovocytes (matière première qui intéresse fort les praticiens) augmentent fortement aussi les dangers des hyperstimulations.

France features prominently among the Western countries that have invested heavily into research and practical applications of *in vitro* fertilization (IVF). As shown by the following statistics, the growth of IVF in France has been extensive.

Sep 1984 100 IVF babies born in the United States (*Time*, September 1984).

May 1985 100th baby born at *one* IVF center in France

Apr 1987 5000 IVF babies born world-wide
1500 born in France¹

Feb 1986 125 IVF centers in the United States
(The *NY Times*, 21 February 1986).
Approximately 100 IVF centers in
France

I have not been able to ascertain the present number of IVF centers in France (it is probably approximately 150). But I believe that their

number is rapidly increasing. According to national surveys,¹ the number of private centers is now increasing more quickly than the number of public centers. The total number of egg retrieval attempts was almost twice as great in 1986 as in 1985 (11,779 in the 53 centers that responded in 1986; 6932 for 39 centers surveyed in 1985). The number of deliveries *and* ongoing pregnancies was 600 in 1985; 1047 in 1986. But only 3 of the 53 centers had more than 50 babies (Fig 1.).

Nor do I know just how many *women* have been involved in the IVF programs. And I have even less information on women in the initial stages of IVF programs or women involved in the anterior investigations. Those include repeated tests, measurements, painful endometrial biopsies, preliminary laparoscopies (under general anesthetic) for diagnostic purposes, etc. Even when IVF centers do respond to enquiries, due to the structure of the surveys, the information obtained concerns the numbers of *cycles* or *eggs* or *embryos* or *pregnancies*. No women or babies appear in the statistics.²

IVF SUCCESS RATES

It is rarely clear what exactly is being measured. Practitioners generally choose to present success rates in terms of “pregnancies per transfer,” which give a favorable bias (Fig. 2).

1. *Pregnancy* is a very ambiguous term (Jones et al., 1983) it can include “biochemical pregnancy,” which terminates, by definition, within a few days; “clinical pregnancy,” which may be “ectopic” (5% of all pregnancies) or terminate by abortion; “ongoing pregnancy” (15 to 20% of which end in a spontaneous abortion), and finally “completed pregnancy” (delivery) (Fig. 3).
2. *Transfer* of the embryos is the last of several stages of IVF: hormonal stimulation of the ovaries, punctures of the follicles, fertilization of oocytes to obtain embryos. Many women never reach that stage of embryo transfer, and thus never appear in those statistics as failed attempts.

Some practitioners emphasize that the IVF success rate (expressed by the “pregnancy/transfer” rate) is equal to, if not greater than, the natural rate of fecundity (births) for fertile couples, which is

about 20 to 30 percent per cycle.

However, a review of recent results in France presents a less optimistic picture. A very small number of French centers have teams of international repute and competitive success rates. A very well known center in Paris, the Hôpital de Sèvres, revealed detailed and precise results this past winter, just after a French sociologist published an article explaining how the IVF results generally have been inflated (Marcus–Steiff, 1986). In 1985 the success rate of that Parisian “good” center – in which 135 babies have been born by the end of 1986 – was 5.9 percent when expressed as the number of births per cycle or hormonal stimulation.³ At many other centers, not even one pregnancy or baby has been obtained. I carried out a study of one large and well-known hospital (the doctor responsible for IVF there has an international reputation) that began IVF attempts in 1984 and currently treats 60 to 80 women per month. The number of babies born there *after* IVF, if not directly *thanks to* IVF, was 40 (including twins and triplets): a (Fig. 4).

RISKS FOR WOMEN

I don’t want to develop here what is quite well known: risks involved in laparoscopies or ultrasound-guided egg retrievals; in extrauterine pregnancies (5 percent of pregnancies), multiple pregnancies, and caesarean sections that are very common with IVF. One success rate of about 1 percent per cycle knows also that “test-tube babies may be our times more vulnerable after birth” (Duboudin, 1985 and Lancaster, 1985). I wish to give information on:

The risks associated with hormonal stimulations

Large doses of hormones are given to women to induce the production of several eggs during one cycle. These treatments, which are always used for IVF, are also prescribed more and more often to an increasing number of women in other cases as well. “It is impossible to examine an infertile couple without remarking that they have already been given all the possible combinations of these products. Little by little, treatment with hMG (human menopausal gonadotrophin) was extended to women who had insufficient mucous, dysovulation, irregular menstrual cycles, successive

Fig. 1. Growth of IVF in France

Number of	1985	1986
Centers responding to a national survey	39	53
Egg retrieval attempts	6932	11,779
Deliveries and ongoing pregnancies	600	1,047*

*Only 3 of the 53 centers had more than 50 babies.

Fig. 2. Steps of the IVF procedure for one leading IVF team in France*

Stages of IVF procedure	Percent success based on (a)
(a) hormonal stimulation of ovaries	100
(b) puncture of the follicles (egg retrieval)	60
(c) fertilization of the eggs to make embryos	–
(d) embryo transfers	46
(e) pregnancies	–
(f) births	5.9

*Calculated from data given at the press conference of the Sèvres hospital in October 1986. The data are for the year 1985.

Success rates are usually expressed by (e/d). Here, exceptionally, they are given as (f/a). Numbers of pregnancies (e) were not made available.

Fig. 3. Outcome of pregnancy*

	Percent based on total pregnancies
Total pregnancies (detected 16 days after embryo transfer)	100
Preclinical abortions	19.1
Clinical pregnancies	80.9
Ectopic pregnancies	5
Spontaneous abortions	18.9
Stillbirths	2.4
Live-birth deliveries	54.6

*Data from Paul Lancaster, director of the National Perinatal Statistics Unit, Sydney, Australia, from his 1985 report: "In vitro fertilization pregnancies Australia and New Zealand 1979–1984."

abortions, defective tubes, a husband with insufficient or defective sperm, etc. To this list we must add unexplained cases of infertility, women in a hurry and . . . doctors in a hurry!" writes a female gynecologist who recently published two articlesentitled "Dangers of the Ovulation Inductors" (Cabau, 1986).

The same author calls the association of (clomiphène + hMG), which is very often used in

IVF, "an explosive cocktail." She points out: "The risks of overstimulation, when severe, lead to hospitalization in intensive care units and place the lives of women in danger; these women, until then, were perfectly well and suffered only from the sickness of wanting a child." She also adds that the aura given to IVF by the media had greatly increased the tendency of giving ovarian stimulation drugs.

Such a situation is much worse than other ones

Fig. 4. "Success" rates after, if not thanks to, IVF

*Sèvres Hospital, a Parisian "good" center**
 135 babies born by the end of 1986 5.9%
 births per hormonal stimulation

A well-known hospital in France†
 Currently treats 60 to 80 women per month
 40 babies since it began in 1984
 1 % births per hormonal stimulation

*Data from the hospital's press conference, October 1986.

†Data from the author's own study.

in which drugs which have no known effect are, however, given. I quote an IVF doctor, "Double blind randomized clinical trials with placebos don't show any significant result in favor of the treatment of Dopaminergic drugs. However these drugs are easy to prescribe, the total absence of risks makes them an interesting therapy to begin with"(Hedon, 1987).

Even though several drug cocktails have already been used all over the world, different new mixtures of drugs and hormones are tested on women. Some do not seem to be in the interest of the women involved, but rather in the interests of scientists, because they mainly make it possible to obtain more eggs, and more embryos, but not necessarily more pregnancies.⁴

Within the past year, a great number of practitioners in France have chosen two new molecules that are "highly active *analogues of LH-RH*" (leutinizing hormone releasing hormone). One is called *Decapeptyl* (Ipsen Biotech). The other, named *Buserelin* (Hoechst Laboratories), is also used in some other European countries (Holland; Britain where it is called HOE 766) but not in the United States where the FDA (Food and Drug Administration) has not (yet?) given a license to market it. The French license for these drugs was given only for treatments of prostate tumors. But nothing forbids any doctor from prescribing such drugs for other indications, if the doctor takes responsibility for it. Some doctors now use these drugs on women.

During a French symposium in April 1987,¹ I heard a doctor expressing anxiety about the possible long-term ill effects of *Buserelin*: "Aren't we risking with it the same problems we caused by

prescribing DES? What are the results of animal tests?" he asked. Since some representatives of the Hoechst Lab were there, I asked them what kind of tests had already been performed on female animals, and what the results had been. They sent me no articles or references, but only a brief report written by Hoechst. It seems that different doses have been tested on approximately 75 female rabbits and 45 rats. The results show that:

Given during the first two weeks after coupling, Buserelin prevents the implantation of embryos, and provokes abortions and fetal mortality in utero. Therefore, this drug is also provided as a possible contraceptive.

When small dosages were applied, according to the report, "Extracted rabbit fetuses had a normal development, did not show external or internal malfunctions and, when put in an incubator, they were still viable after 24 hours," ... "Extracted rat fetuses showed a retarded development and a urinary tract dilatation." Their conclusion: "*no malformation was observed*"! The general conclusion of the report was: "Buserelin does not seem to produce teratogenic effects." (The emphases are mine.)

Is it responsible, considering those conditions, to use this product on a large number of women? Beyond the fact that they were told that the pregnancy rate by transfer was higher (it is supposed to be 40 percent) how well were these women informed? Did they give an informed consent?

Using those drugs on women is, in fact, what has been done first on the so-called "poor responders" (women who did not produce a lot of eggs when they were stimulated by classical mixtures) and is then enlarged to different "populations of women". Buserelin was given to women labeled as "nonretrievers" (those who, during a previous attempt had only two oocytes retrieved), "nonfertilizers" and "nonimplanters" (in French: "non-recruteuses," "non-fécondeuses," and "non-implanteuses").⁵ This expansion will concern more and more women. I quote some sentences heard in symposia or read in scientific articles: "The utilisation of the agonists of LH-RH makes a *revolution in the stimulation concept*," ... "it enables us to obtain wonderful results in IVF," ... "The success rates have soared," ... "I don't think it will be necessary in the future to still use the old and classical stimulating drugs."

Buserelin is used on women to obtain a "pituitary desensitivation," also called "reversible chemical ovariectomy," "castration," or "reversible menopause." This drug can block "the feminine cyclic clock," can suppress the endogenous production of the LH-RH hormones that are needed to induce ovulation. Natural production of hormones by women, from a medical point of view, interferes inconveniently with the exogenous stimulations (i.e., the medical ones).

Therefore, IVF practitioners, being unable or refusing to be in phase with the hormonal cycles of women, block these natural cycles and impose an exclusively exogenous stimulation of the ovaries. As some of the practitioners said: "The aim of the treatment is to reimpose a normal rhythm over a disordered one, to recover a virgin soil."⁶ Another aim is to obtain a very big number of eggs: it is not rare to retrieve more than 10 eggs per attempt. Some are used either for research such as freezing attempts⁷ or to obtain a large number of embryos, some of which are then frozen.⁸

Thus, there is first a treatment (Buserelin) that stops the natural production of hormones needed to induce ovulation. Then other drugs are prescribed to induce the ovulation that has been blocked.

Whatever opinion one may have about this kind of procedure, one must know that before provoking the blocking effect, the same drug begins by inducing the opposite effect. It strongly stimulates the production of the LH-RH hormones through an unavoidable and very dangerous effect called "flare-up." This may involve very strong overstimulation and the production of cysts on the ovaries. A French doctor working in the well-known Bécclère Hospital (near Paris) noted that during the time when the team was in the Vth international meeting of IVF in Norfolk (USA) in April 1987, two women out of seven previously treated with Buserelin had severe accidents: one suffered from a big ascite which forced her to be hospitalized for several days; the other consulted a surgeon who was not an IVF specialist and said he had never seen ovaries in such an abnormal state. Thus he extracted what he thought were big cysts; fortunately he stopped short of removing the ovaries themselves.

Now IVF doctors in France have perfected the programming of ovulation to avoid its occurrence at night or on weekends. As René Frydman, the inventor of this kind of programming, said:

"Doctors also, need their weekends and holidays!" He also gave another reason: regular hours result in the reduction of the cost of IVF (15,000 FF [French francs] per attempt). To obtain these "advantages," doctors block ovulation during one cycle before the beginning of the IVF cycle, by giving the sterile women a ... contraceptive pill! The doctor can then schedule the ovulations, deciding which women stop swallowing the pill on which day, and thus schedule all hormonal stimulations, egg retrievals, and embryo transfers to occur between Monday morning and Friday afternoon.

EXPANDING THE INDICATIONS OF IVF

At first, IVF was supposed to "treat" tubal infertility: the egg (or oocyte), unable to move and be fertilized in the fallopian tube, was surgically retrieved and then fertilized in vitro. The next step was hormonal stimulation, to obtain several eggs.

Today, things are very different. The French survey¹ of 53 IVF centers shows that now only 60 percent of the attempts relate to *tubal diseases*; 16 percent of attempts of IVF (which is a risky, painful, and mostly unsuccessful) are performed in response to *male infertility*. Such an evolution (decreasing the percentages of tubal indications and increasing the ratio of male infertility) is becoming general all around the world. The treatments of those 16 percent of male infertility indications are distributed in the following manner in France: 10 percent with the husband's sperm and 6 percent with a donor's sperm. When a donor's sperm is used one can wonder why AID (artificial insemination by donor) is not chosen. The answer is probably that there is intensive competition between AID and IVF centers, for the very lucrative procreative market.

Moreover, 24 percent of all IVF attempts concern "*other indications*" among which are the so-called "idiopathic" or "unexplained" infertility. The origins of those are probably psychic or social. For one, some women included in IVF programs are fertile and become pregnant without ever receiving any IVF treatment. In his book *L'irrésistible desir de naissance* (1986), French IVF doctor René Frydman confirmed that 5 percent of women on one waiting list became pregnant without treatment. For another example, according to one IVF practitioner who spoke to

me, some women who became pregnant after an embryo transfer by IVF were subsequently shown to have become pregnant by previous sexual intercourse, not the IVF procedure (ultrasound examinations giving the gestational age of the fetus revealed this) (Fig. 5).

IVF ONLY: IVF AS THE MODEL OF PROCREATION?

Because of the great expansion of the indications for prescribing IVF, some women⁹ fear that IVF may become the general pattern of procreation. Taking into account the ideological pressure coming from the medical sphere, the media, and the family, how is it nowadays possible for a woman who has been declared infertile to refuse trying IVF at least once?

Doctors argue that IVF enables them to choose the best quality gametes and to monitor the development of embryos. They can say that sort of thing even when it is not true. For example, studying some scientific articles in Buserelin, I read that doctors gave, as they said, “supraoptimal doses” trying to get more eggs, even if those were of “suboptimal quality.” But as I mentioned before (see note 7) it may be of interest to scientists to get “immature eggs” in order to freeze them (Porter *et al.*, 1986).

In spite of some resistance arising here and there from ethics committees, research is already being carried out to select the sex of the embryos and to analyze their DNA in order to determine and eliminate those who may have genetic defects.¹⁰ The statement made by Jacques Testart, the well-known French biologist working on IVF, when he was calling for a moratorium on that kind of research, made as much noise in the scientific community and in the media as the resignation in Australia of Robyn Rowland in 1984 as chairwoman of the committee coordinating social research into donor programs at Queen Victoria Medical Center. Testart argued that, otherwise, IVF will rapidly offer “made to order” or “custom-made” babies to couples (Testart, 1987; Nau, 1986a).

All these wider prospects allow practitioners to describe and sell IVF as “giving something more” meaning “something more than the old way of having babies.”

SOME MORE NEW, NEW, NEW TECHNOLOGIES

Doctors and biologists are not short of imagination. They invent what they call “new” and “simplified” methods. They have already rediscovered that an egg is certainly more successfully fertilized in a Fallopian tube than on a laboratory bench thanks to a new method called *gamete intra-Fallopian transfer* (GIFT).


GIFT was invented by a Czech team; then it was largely practiced in the United States by Ricardo Asch; now it is used in most countries that practice IVF. Women get stimulated as usual. Eggs are removed from the follicle (either by laparoscopy or under sonographic guidance); doctors put into a catheter first two or three eggs, then a bubble of air, then some spermatozoa. All those components are introduced into the Fallopian tube(s) under anesthetic where the fertilization is supposed to occur.

As no direct contact between the gametes, nor any manipulation of any embryo occurs, some people (among them Catholics) appreciate this “advantage” of GIFT.

One could wonder if tubes have to be in perfect condition to ensure good results with this method. The answer is: of course they must be! In other words, this “new method” supposes – and only works on – women without any tubal sterility. That’s why more than 50 percent of the attempts are made on women with unexplained infertility (the other ones being cases of endometriosis, immunological or male infertility). So one can reasonably assume that a lot of these women are not infertile. And that makes, again, a very good situation to obtain higher success rates.

According to some data presented at the Vth World Congress on IVFET [*in vitro* fertilization and embryo transfer] in Norfolk (April 1987), rather contradictory results were obtained. An enquiry made by Ricardo Asch¹¹ shows that out of 800 attempts made in the United States, Europe, and Australia, there were 201 deliveries or ongoing pregnancies (25 percent success rate). According to data given by an Australian team, a comparison between GIFT and IVF indicates that success rates are respectively only 16 percent and 10 percent “ongoing pregnancies per attempt.” Nevertheless Johnston, presenting the results of this same team, talked about 70 percent ongoing pregnancy rate for

Fig. 5. Indications for IVF*

Tubal diseases	60%		10% using husband's sperm
Male infertility	16%		6% using donor sperm
Other indications	24%		

Author's conclusion: Women who are probably not infertile: 40%

A similar assessment was made by French IVF biologist Jacques Testart, as reported in Nau, 1986b, "According to J. Testart, infertility represents today only 50% of the cases which are treated, the others only being the consequence of a medicalisation of reproduction."

*Data from a natinoa! survey of 53 IVF centers in 1986. see note 1.

GIFT, higher than IVF (53 percent). These numbers result from another favorable way of calculating success rates: they are so high simply because they are *not success rates but percentages of ongoing pregnancies in relation to all IVF pregnancies* (and not *attempts* of IVF).¹² In France, 411 GIFT attempts were made in 10 centers; only 40 "ongoing pregnancies" (less than 10 percent of attempts) were obtained.¹³

However, one French GIFT practitioner said that he obtains 30 percent "beginning pregnancies" and that GIFT makes "a real, true revolution which is going to modify gynaecology and obstetrics profoundly and that gives a chance to 1 woman out of 3 to become pregnant."¹⁴

The only benefit of that (old) kind of emphatic and probably false declaration, about "new, new, new methods" is to bring with it new (and probably true) information about the "old" method. In the above-mentioned article, which gives a 30 percent success rate for GIFT, one reads that "In comparison, the mean IVF success rate is only 7 percent per attempt." Don't forget that, last year, IVF success rates were supposed to be at least two or three times greater.

The same article lets us also understand that the competition between GIFT and IVF may become dangerous for laboratory biologists because they are no longer needed for GIFT. The same thing is true with some other methods:

Intra-vaginal culture and embryo transfer: IV CET. Eggs are (once more) collected and put with spermatozoa in one or several little boxes placed in the women's vaginal cavity instead of an incubator. This French method received an official prize during the meeting in Norfolk "because of its simplified and clever procedure." For whom is it more simple? Certainly not for the women who still have their ovaries stimulated and their eggs retrieved and replaced under anesthetic. The simplification and the cleverness result here from

the fact that women enable the clinic to avoid purchasing an incubator and paying a biologist. But, as usual, doctors talking instead of the women say that women feel less frustrated because they are thus able to participate in the biological process of fertilization and take their eggs home (Rayr, 1986).

Intraperitoneal fertilization: IPF. Here, the meeting place of egg and sperm changes again. A mature egg normally drops in the Pouch of Douglas. In IPF, sperm is injected into this pouch, which is supposed to offer "an ideal culture medium." Then, one has first to hope for fertilization. Two or three days later, the embryos, if by chance there are any, are supposed to be "naturally" aspirated by the funnel of the Fallopian tube. Or, they may be sucked up by a doctor with a syringe and transferred to the uterus. But some of them may remain in the peritoneum and implant there, which gives a peritoneal, extremely dangerous, pregnancy.

Peritoneal oocyte and sperm transfer: Post. This is a British cousin of the previous example. The difference here is that the eggs are retrieved before being injected with sperm into the Pouch of Douglas.¹⁵

WOMEN: THE BEST GUINEA PIGS

Thus the interests of women who want to have babies and those of doctors and scientists are far from being identical. First of all, IVF and NRTs mean money whether there are babies or not. Furthermore, this domain offers a rapidly expanding field of research that holds promise for the careers of many scientists. A large number of articles on NRTs are published in a growing number of scientific journals, and there is hardly a month without one or several conferences or symposia on IVF.

Moreover, the scientific field and the procreative market are really very competitive.

Those who do IVF say that it can be used as a “diagnostic means of testing the procreative capacity of spermatozoa” and that IVF is “helping male infertilities” and it is “at the service of science.”¹⁶ Those (but they are sometimes the same) who invent other methods say they are “simpler and/or more natural.”

Above all, it is clear that women are the best subjects for experimentation. As opposed to mice or monkeys, women are intelligent and can talk. They are conscious of how and when their ovulation occurs; they can observe and describe to the doctors the effects of different medications; they don't have to be purchased, fed, or kept in a clean cage; they come to the hospital all by themselves, on the right day, at the right time, and they pay for that privilege (sometimes exorbitantly)!

I quote from a recently published medical book:¹⁷

IVF is a remarkable instrument for testing new ovulation procedures thanks to: the parameters it allows to be controlled; *the number of women who can be treated*; lastly it enables controlled series to be carried out which compare the new therapeutics with “routine” stimulation protocols. *It no longer appears possible to consider the marketing of new drugs for stimulating the gonadipituitary axis unless they have been tested within the framework of IVF.* (The emphasize is mine). (Buvat and Bringer, 1986)

So, I just want to ask the question: are NRTs at the service of women or women at the service of science?

ENDNOTES

1. Two national surveys among some IVF centers in France have been done by the national institute of research on medicine: INSERM. Thirty-nine centers responded in 1985, fifty-three in 1986. The results were resented in the first and second symposia “Journées de Périconceptologie” (April 1986 in Kremlin-Bicetre, and April 1987 in Tours) by Dr. Jacques de Mouzon.

2. For more details, see Françoise Laborie (1987) “Looking for Mothers, You Only Find Fetuses” in Patricia Spallone and Deborah Lynn Steinberg (eds.) *Made to Order: The Myth of Reproductive and Genetic Progress*, Pergamon, Oxford.

3. Press conference of Dr. Jean Cohen in Paris, 14 October 1986.

4. Speaking about one of these drugs, Buserelin (details to follow), René Lepoutre said in “Agonistes et Antagonistes de la LH-RH: de la contraception aux cancers” (*Gyn Obs* 157, 15 November 1986), “It seems that more follicles and more embryos are obtained, but is it the case with pregnancies? ... Are the results better than those which are obtained by transferring 3 embryos as in classical methods?” He added, “That is the feeling of Dr. Zorn who had not, however, any base to compare data.”

5. According to results presented in Tours, April 1987, by Mrs. Neveu (see note 1).

6. Stated by Dr. Jean Cohen, as quoted by René Lapoutre in *Gyn Obs* cited in note 4.

7. Research on human oocyte (egg) freezing has been made in different parts of the world. It is also done in France. Jacqueline Mandelbaum (hôpital Necker, Paris) presented some results at the Vth World Congress on In Vitro Fertilization and Embryo Transfer, April 1987, Norfolk. I quote part of her abstract, “Since the risk of spindle depolymerization of the mature oocyte during the freezing process could lead to *a loss of chromosomes and a subsequent aneuploidy*, we decided to apply freezing either to immature oocytes ... or to mature oocytes ... Oocyte survival was higher for the frozen/thawed mature oocytes (71 %) than for the immature ones (35%), but *we observed after cryopreservation a reduction in the fertilization rate of mature oocytes and an enhancement in the percentage of polyploidy when compared to classical IVF*” (the emphasis is mine).

8. According to Jacques Testart (April 1987 in Tours, see note 1), 65 births from frozen/thawed embryos have occurred in the world; in France 23 babies have already been born after thawing frozen embryos; one pregnancy resulted from a thawed embryo that had only one “good” cell left, out of the 4 that were present when frozen (at the time, the woman's pregnancy was five months along).

9. Among them Laurence Gavarini, “La reproduction en Vitrine” in *Corps Ecrit* 21: 61–68 Ed PUF, Paris, April 1987.

10. A study in this field arising from a Scottish team directed by John D. West is quoted by Dr. M. Kamel in *Le Quotidien du Médecin*, June 24, 1987: “Une étude publiée dans la revue *Lancet*. La détermination du sexe serait désormais possible dès le stade préembryonnaire.” Jacques Testart sent me another reference, “Prenatal diagnosis in the human pre-implantation period” (1987) in *Human Reproduction* 2(3):267–270. It is the report of an informal guest meeting held by the Ciba Foundation on 13 November 1986 to increase awareness and promote discussion and collaboration in this area.

11. “Results of the multicentric international cooperative study of GIFT” by Ricardo Asch, University of California at Irvine, Orange, California.

12. Program supplement given to participants of the Vth World Congress on In Vitro Fertilization and Embryo Transfer, April 1987, Norfolk.

13. Because of the reduction in incidence of 'biochemical' pregnancies (GIFT 10 percent, IVF 28 percent), there was significant improvement in ongoing pregnancy rates for (GIFT 70 percent, IVF 53 percent)", in Johnston, W. I. H.: "The place of GIFT in treatment of the infertile patient." Program supplement given to participants of the Norfolk conference (see note 11).

14. According to the results presented in the "Deuxièmes Journées de Périconceptologie," April 1987 in Tours (see note 1).

15. Professor J. R. Zorn (Maternité Baudelocque, Paris) quoted by Jean Yves Nau in "Fécondité a la carte", *Le Monde*, 10 June 1987.

16. The first time I heard about this "new" method was in Norfolk. It is carried out by V. Sharma and others in the Hallam Medical Center, Hallam Street, London.

17. According to, for example, Dr. Jean Cohen, "La Fécondation in vitro pourquoi faire?" in *Gyn Obs*, 15 November 1984.

18. In J. Buvat and J. Bringer (eds.), 1986, *Induction et Stimulation de L'Ovulation: Progrès en gynécologie I*, Paris. The sentences quoted here are in Chapter 4, "Apports de la fécondation in vitro à la compréhension des mécanismes de l'ovulation spontanée et stimulée" by B. Hedon et al.

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