CURRENT DEVELOPMENTS AND ISSUES: A SUMMARY

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IN VITRO FERTILIZATION

Uterus, tubes and ovaries of 32-year-old woman removed as a result of infection following transvaginal aspiration of eggs for IVF

Many IVF teams are failing to use a simple method to prevent infectious pelvic complications of transvaginal follicle aspiration because they are concerned about adverse chemical effects on the oocytes, Dr. David R. Meldrum writes in an editorial in *Journal of in Vitro Fertilization and Embryo Transfer.*

Because of this failure, complications have inevitably occurred, Meldrum, of the In Vitro Fertilization Center in Redondo Beach, California, U.S.A., observes. In one recent report, he notes, three serious infections were observed in 92 transvaginal aspirations in spite of a povidone-iodine prep of the vagina (R. S. Howe, C. Wheller, L. J. Mastroianni, L. Blasco, & R. Tureck. [1988]. Pelvic infection after transvaginal ultrasound-guided ovum retrieval. *Fertility and Sterility.* **49**, 726–728). The uterus, tubes and ovaries of one 32-year-old woman had to be removed as a result of one of the infections, he points out. These are not isolated occurrences, Meldrum writes, noting that he was aware of other incidents across the country of apparent adnexal infection requiring antibiotic therapy.

"We were taught to stay out of the ovary during vaginal surgery because of the risk of ovarian abcess," he writes. "To perform vaginal surgery through an unprepped vagina and to enter the ovary would be unthinkable. Yet several teams beginning to utilize transvaginal puncture have failed to incorporate a thorough antibacterial preparation of the vagina, due to concern about adverse chemical effects on the oocytes."

He points out that physicians now routinely use prophylactic antibiotics for vaginal surgery because a dramatic reduction in infectious pelvic complications has been well documented. But presumably due to a concern about the effects of these antibiotics on the oocytes, many IVF teams have not followed this practice, he writes.

In the editorial, Meldrum expresses concern about "the casual approach to sterile technique during the transvaginal aspiration of follicles by many using this method . . . ".

DAVTD R. MELDRUM. 1989. Antibiotics for vaginal oocyte aspiration. *Journal of in Vitro Fertilization and Embryo Transfer.* 6(1): 1–2.

Thirty-four-year old woman undergoes removal of kidney following six unsuccessful IVF attempts

Four months after her last IVF attempt, a 34-year-old woman who had undergone six unsuccessful IVF procedures consulted physicians complaining of left loin pain, frequency of micturition, and vomiting. In the IVF attempts, which had taken place between 1985 and 1988, she had undergone egg capture four times by laparoscopy and twice by vaginal ultrasound. There had been no obvious complications during or after the eggs captures and all had been performed by experienced operators.

"A renal ultrasound demonstrated a gross left-sided hydronephrosis and hydroureter and a percutaneous nephrostomy was performed with drainage of purulent urine. An antegrade nephrostogram then showed an obstruction at the level of the lower border of the left sacroilac joint, the appearance suggestive of extrinsic compression."

The woman's left ovary was firmly adhered to the side wall of the pelvis over the site of the ureteric obstruction. There was no evidence of active or old endometriosis.

The left kidney was functioning at an extremely poor level, as a renal scan revealed. This kidney was removed one month after the woman consulted physicians with her symptoms. Her recovery was uneventful.

Writing of this case in Adelaide, Australia, the authors observe:

> "Although it could not be shown conclusively that ureteric obstruction in this case was directly related to oocyte retrieval, the evidence is highly suggestive. This may have occurred from inadvertant direct trauma from the needle tip to the ureter with resultant scarring or, perhaps, from hematoma formation and external compression, although no evidence for this was found at subsequent laparoscopy."

It seems unlikely that endometriosis caused the obstruction, they note. Nor was there any retroperitoneal pathology or preexisting symptoms of urological pathology.

The authors note that, due to adhesions, it is common for the mobility of the ovaries to be diminished in women undergoing IVF.

"Diminished ovarian motility and accessibility make 'blind' puncturing of the follicles at laparoscopy more likely in an attempt to recover the maximum number of oocytes, thereby increasing the risk of trauma to adjacent pelvic structures."

Trauma is also possible at transvaginal egg captures because, while the tip of the needle can be seen most of the time, it is often near the peritonal surfaces underlying the ovary, "raising the possibility of trauma to underlying structures."

Noting that this case describes a serious long-term complication of egg capture, the authors conclude: "It would seem logical to suggest that the risk of such trauma increases with the number of oocyte retrievals per patient, and such risks should be considered when offering multiple cycles of IVF treatment in patients whose ovaries are adherent to the lateral wall of the pelvis."

While delineation of the follicles is clearer with ultrasound than with the direct visualization under laparoscopy, the margins of adjacent pelvic structures are not as obvious as with direct visualization, the authors observe.

W. R. JONES, C. J. HATNES, C. D. MATTHEWS, and C. A. KIRBY. 1989. Traumatic ureteric obstruction secondary to oocyte recovery for in vitro fertilization: A case report. *Journal of in Vitro Fertilization and Embryo Transfer.* 6(3): 185–187.

Study finds 70% of women optimistic about success with IVF on first attempt but their optimism declines with succeeding attempts

A study of 77 women in an Australian IVF program found that 70% of the women reported being moderately to highly optimistic of success with the first IVF attempt.

"With a second, third, fifth, and sixth attempt, no women reported moderate or high levels of optimism," the researchers from Queensland, Victor J. Callan and John F. Hennessey, wrote. "With a second and fifth attempt, the vast majority of women was only slightly optimistic, and with a third and sixth attempt, optimism was low."

The major strategy the women reported for coping with the emotional and physical demands of IVF was adopting a positive attitude (50%).

"This positive approach included realizing that women did get pregnant, and there was every reason that they also could be lucky," the researchers wrote. "In addition, part of a positive attitude involved developing a long-term approach to IVF, in that women generally expected to have a number of attempts, and if an attempt was not successful, another attempt might be successful."

In discussing the purpose of their study, the researchers note that "more information is needed about the emotional experience of IVF, in particular toward preparing couples for the demands of the program and informing them about better ways of coping."

Callan is a Reader in Psychology at the University of Queensland and Hennessey is medical director of the Queensland Fertility Group.

Other coping strategies the women in the study reported were: keeping busy with such activities as housework, shopping, reading, and visiting friends (20%); emotional preparation through rest, relaxation techniques, yoga, or "just keeping calm" (19%); talking with other IVF women (13%);

confiding in husbands and close family (10%); trying not to think much about IVF (10%); outside interests (9%); and attempting to improve physical health prior to an IVF attempt (7%).

Most women indicated they would go through three or four IVF attempts before deciding to stop. Others gave no number but stated that one of the factors influencing them would be the wishes of their doctor. Other factors would be their age and their ability to emotionally deal with failed attempts.

The most frequently mentioned reasons the women gave for their lack of success were the low IVF success rate (28%), being too tense, anxious, or stressed (25%), fate or bad luck (15%), unknown (15%), problems in access to their ovaries or failure of the ovaries to produce eggs (13%), problems in timing egg pickup or overstimulating the ovaries (13%), and being in poor health before or after the procedure (12%).

The majority of the women reported that people frequently made negative remarks about their continued childlessness. While the women were sometimes told that they were lucky to be childless, on other occasions "they were seen as unfortunate and unfulfilled." Many women reported being told not to have children because their lives would only change for the worse.

The researchers observe:

> "Infertile women are perceived as different, and as most women accepted, a consequence of continued infertility would be the strain of being unlike most women and having less in common with mothers. On top of this is the likelihood of continued negative comment. Three-quarters of the women were the victims of negative comments. In particular, like women who are childless by choice, infertile women are perceived as selfish, materialistic, and not liking children. Quite often women were seen as being childless by choice."

Noting that their sample revealed that a major strategy for coping with the demands of IVF is to develop a positive attitude, the authors conclude: "Women need to be counseled to adopt a long-term approach to IVF-ET, giving themselves a number of attempts to try to achieve a pregnancy."

VICTOR J. CALLAN and JOHN F. HENNESSEY. 1988. Emotional aspects and support in in vitro fertilization and embryo transfer programs. *Journal of in Vitro Fertilization and Embryo Transfer.* 5(5):290–295.

Study of Spanish print media reveals uncritical acceptance and promotion of in vitro fertilization

An examination of newspaper and magazine articles on in vitro fertilization (IVF) in Spain reveals that the physicians' assessment of IVF is being presented to the public as the dominant reality. With few exceptions, physicians – sometimes described in heroic terms – are sought as the experts on IVF and little space is provided to critics of the technology.

Many articles on IVF births state that the baby and mother are "in perfect condition," though this news is sometimes followed by the contradictory observation that the baby is in an incubator in an intensive care unit and that the mother is recovering from cesarean section, major surgery.

For example, *El Pais* (Sept. 20, 1984) reported that "Lorena, the second [Spanish] test-tube baby, born yesterday in Barcelona, is in perfect condition, as is the mother . . . ." *El Correo Gallego* (June 14, 1988) reported that, according to a physician who attended the birth, the first Spanish IVF triplets and their mother were in perfect condition." It added that the smallest of the three babies "will have to stay some time in an incubator until it has gained some weight and increased its reserves," *La Vanguardia* (June 14, 1988) and *El Pais* (June 4, 1988) reported the story in the same way – the mother, who had had to undergo a cesarean, and children were in perfect condition and one of the babies would have to stay in an incubator for some time, "in spite of the good health of the recently born," as *La Vanguardia* put it.

Reporting on a woman who gave birth to IVF quadruplets by cesarean section, *La Vanguardia* (April 23, 1989) noted that the patient was "in perfect condition," and added: "The quadruplets . . . are also in a perfect state of health inside an incubator."

One of the early articles on IVF is headlined: "Two Catalunia teams compete for the first Spanish 'test-tube baby'" (*El Pais,* November 14, 1982). Two teams of gynecologists in Catalunia have been investigating for months the possibility

of applying Steptoe and Edwards' IVF technique, the newspaper reported.

"Both teams assure that an important social demand exists and that they collaborate between themselves, as was demonstrated by their recent participation in a congress together, although it doesn't escape anyone that each would like to be the first to obtain success."

El Pais adds that the two teams, El Centro de Fertilizacion and the Instituto Dexeus, "have selected, respectively, 40 and 80 women, each of which has the indications to submit herself to this passionate scientific adventure of fertilizing an egg in the laboratory and re-implanting it in the mother."

The article notes that "the possibilities of fertilizing in a laboratory are somewhat inferior to those of a couple who has sexual intercourse during the days of optimum fertility."

El Pais reports that the andrologist Simon Marina is conducting parallel work on two Catalunian projects "in order to crown with success the first test tube baby born in Spain."

Marina and his colleagues have been experimenting with IVF on rats since 1979. He is quoted as saying: "In the last year, the experiences have been optimal, which allows us to believe that we are in the final stage of the process leading to experimentation on the man (sic), seeing that, on the other hand, there are no additional risks."

The article further notes that Louise Brown, the first test-tube baby in the world, then six years old, "is beginning to show a superior intelligence."

In a side-bar accompanying an article on the birth of the first Spanish test-tube twins, *El Pais* reports (November 1, 1984) that "The IVF technique is the only alternative for women who want to procreate and suffer an obstruction of the tubes, and for those cases of masculine sterility caused by a low number of sperm, as well as for those couples with sterility due to immunological causes." In fact, there are other treatments.

It adds that in a press conference called on the occasion of the birth of the first Spanish IVF baby, the doctor who directed the operation declared that this type of fertilization could solve the sterility problem of some 70,000 Spanish couples. There had been only one success at the time he announced this and five years later, only 300 such babies had been born in Spain – an average of 20 babies for each of Spain's 14 IVF teams – or four babies per year per team.

Dr. Pedro Barri of Dexeus was quoted in *Diario de Teruel* (July 14, 1989) as stating that in the five years since the birth of Victoria Anna, more than 450 IVF pregnancies have been achieved by IVF in Spain, and more than 250 babies born. There were 60 pregnancies with frozen embryos, resulting in the births of 30 babies. He did not provide figures on how many women had been subjected to IVF how many times in order to achieve those 280 births. However, an article by Pilar del Burgo in *Levante: Diario Regional Valenciano* (July 15, 1989) pointed out that in order to achieve its first test-tube baby, Hospital La Fenaciera had subjected the mother to 15 IVF attempts.

An article in *El Periodico* (November 17, 1989) on the birth of the first Spanish child after tubular implantation of the embryo stated: "The mother, 34, suffered from sterility of unknown origin and had not succeeded in becoming pregnant through the traditional technique of in vitro fertilization." A technique so experimental that 14 clinics could produce only 280 births in five years is described by the newspaper as "traditional."

The newspapers report the births of the first Spanish IVF baby, Victoria Anna, July 12, 1984; the second, Lorena, Sept. 18, 1984; and the third, twins, Sergi and Gemma, October 31, 1984.

An article in *El Pais* reporting that a physician in a private Madrid clinic, Clinic 2200, claimed to have had the first Spanish IVF baby in April 1984, two months before the birth of Victoria Anna in Barcelona, revealed the competition between some IVF teams.

The gynecologist Angel Sopena, who is also a veterinarian, said that he had been freezing human embryos for the past four months but had kept that fact completely secret until this point. He had frozen three human embryos, and implanted them in two women, neither of whom became pregnant, he said.

ElPais continued: "At the same time, Angel Sopena . . . affirmed that the first Spanish test-tube baby was named Lucia and was born in April, 1984, that is to say, two months before the birth in the clinic Dexeus, in Barcelona, of Victoria Anna, the girl considered to be the first Spainard conceived by in vitro fertilization."

According to Sopena, *El Pais* reported, the reason for maintaining such spectacular results in

absolute secrecy, was that the couples involved refused to accept publicity on their cases out of fear of the problems the publicity could entail for them. Sopena also said he didn't like publicity and that he had not presented scientific communications as yet because he wanted to prepare more data and contrasting cases. He said he was now abandoning his silence because of the declarations of other IVF teams working in Spain and because some teams were announcing that they would be the first to freeze embryos.

His team is now working on freezing eggs, he added.

Sopena told *El Pais* he had begun to work on embryo freezing and IVF in the same year, 1978, because he believed it was unethical to throw out surplus embryos. He added that he believed, based on the Spanish Constitution, that embryos are regulated by the same norms that regulate fetuses before birth. Based on this, he said, frozen embryos can not be destroyed in any case. If one of his patients died, he said, "I would consider that the embryo had been left an orphan and would turn to the Board of Adoption."

In an accompanying article ("Los medicos no comprenden el secreto de las investigacions"), *El Pais* reported that the physicians at Instituto Dexeus in Barcelona treated with skepticism Sopena's assertion that his team, not theirs, had produced the first Spanish test-tube baby. Dr. Pere Nolasc Barri, one of the doctors involved in Victoria Anna's conception, said that the investigations and work conducted by Sopena had not been presented at any congress or symposium or in a scientific journal, "the normal channels of communication in the medical profession."

In an interview with Leonor Taboada in *El Pais* (April 11, 1987), Jose Egozeue, a professor of cellular biology at the Universidad Autonoma of Barcelona, said he believed that in vitro fertilization could have a superior success rate than natural fertilization. Asked how the human eggs were obtained from which embryos were made for use in their investigations, Egozeue replied that they were not embryos – they were clumps of cells or "pre-embryos" and that they were donated by women in IVF programs. He said: "The women who are in IVF programs donate one of every 10 eggs [they produce], two for every 20, etc. According to a study presented by the president of the Medical Research Council to the Council of Europe, 79% of the women who were asked agreed to such a donation, independent of their religion."

Few critical comments on IVF appear in the Spanish print media, and many of these comments are reported on in regional newspapers rather than in the national one, *El Pais.*

One such article, by Concha Edo in Madrid's *Ya* (January 4, 1988), reports the statement of a female physician that the spectacular nature of IVF technology and artificial insemination by donor (AID) is preventing the development of other sterility treatments that have a better chance of success. The physician, Ana Carmen Marcuello, an endo-crinological gynecologist and specialist in microsurgery on the tubes, criticized a comprehensive law on the new reproductive technologies proposed by the Socialist Group (and passed October 20, 1988), a law favorable to the technologies that IVF practitioners played a large role in developing.

The law was completely inadequate, Marcuello said, because "the text neither recognizes the experiences of other countries nor pays attention to the numerous voices of alarm that, on an international level, have expressed themselves on this theme."

Marcuellos considers that the socialist proposal

> "doesn't take into account the whole truth. And this truth is that, for now, the percentage of success is very low; to the women who submit themselves to this technology can not be offered more than a chance of success of 20 per 100 in the best of cases and in the best of hands . . ."

Marcuello insists that there are alternative techniques to which less interest is dedicated as well as fewer personnel and less money, because they aren't so spectacular. For example, she said, microsurgery to repair tubes has a success rate between 30 and 40%.

Another critical article, written by Alica Jasanada in *La Vanguardia* (May 10, 1988), reports that a study conducted by Instituto Dexeus of 130 couples in IVF treatment found that IVF "provokes, in an important number of cases, confusion, passing depression and occasional anger." The exact number of cases was not stated.

Christina Prieto reported in *Ideal* (November 11, 1989) that according to the director of the

Centro Asesor de la Mujer en Almeria "there is enormous disinformation about these themes [the new reproductive technologies] and for that reason I think it is most important that society, and more concretely, the people of Almeria, inform themselves on the pros and cons of IVF."

The director was speaking at a conference on artificial maternity that was addressed by three members of the Feminist International Network of Resistance to Reproductive and Genetic Engineering (FINRRAGE): Leonor Taboada, Maria Jose Varela Portela, and Paula Bradish.

In another critical article appearing in *Atlantico Diario, a.* newspaper in Galicia, Ana Ramil wrote (February 16, 1989): "Spain could be converted into the genetic experimentation laboratory of Europe if the recently approved Law on the New Techniques of Assisted Fertilization is not modified, according to the attorney Maria Jose Varela . . ."

Speaking at a conference organized by the Information Center of the Rights of Women, Varela pointed out that the new law condemns genetic experiments with human embryos but that the most severe penalty is a fine of 100,000 pesetas. In Varela's judgement, this aspect of the law means that in Spain, one can make "any genetic aberration at a moderate price." Multinationals, Varela noted, would have no problem paying such fines.

Varela judged many aspects of the law to be unconstitutional, including the provision that married women must obtain the consent of their husbands in order to have access to the reproductive technologies. Another unconstitutional aspect of the law, she said, was the denial of the rights of succession to children conceived with the technologies after the father's death if he has made no provision in his will authorizing his paternity. This, Varela said, was discrimination on the basis of birth and created a new category of children, without rights, distinguished from the other children of the couple.

The law also opens the door to contract or surrogate motherhood, Varela added. Despite the declaration in the law that surrogacy contracts are not enforceable and that the mother is always the woman who gives birth, the law allows the sperm donor to claim paternity before the courts. In Varela's opinion, this last provision of the law seems to recognize a right of the sperm donors to claim paternity of the children and because they come from a higher economic class than the mothers, who largely come from a marginal sector, they have a much greater possibility of receiving custody of the children.

The principle failing of the law, for Varela, is the scanty protection of the physical and mental health of the women who submit to these technologies.

Varela stated: "The text is fundamentally disposed in favor of the rights of the doctors and, in contrast, the woman, as consumer, is left totally unprotected." She pointed out that there are no criteria for guarding the health of the woman in cases of multiple pregnancies. "On the contrary, it says in the text that as many embryos can be transferred as are necessary to assure the success of the procedure," she stated. There is no mention in the law of the danger to the health of the woman should such a practice be followed.

Reporting on that same speech in *Faro de Vigo* (February 16, 1989), Marisa Real quoted Varela: "Women will always be in the hands of shifting scientific criteria since the law says that the technologies are to be applied when they are 'scientifically and clinically indicated, and the doctors always dictate this.'"

An article on the birth of Spain's first test-tube triplets is one of those in which an IVF practitioner is painted in flattering colors. In *ABC* (May 1988), Jose Maria Fdez.-Rua refers to the doctor involved, Eduardo Garcia-Otero, as "this prestigious specialist." Internationally it is recommended that the IVF patient should not be over 40, he writes, "although this Center of Seville directed by Dr. Garcia-Otero has achieved spectacular successes in older patients." The Center of IVF and Embryo Transfer has a success rate between 18 and 24%, Fdez.-Rua reports, with-out including the definition of success being employed. He quotes Garcia-Otero: "These percentages are very good, which means that they are approaching the percentages of success in natural pregnancies."

The IVF Center, Fdez.-Rua writes, "was born three years ago, and in spite of its short history, it is among the first in Europe."

He quotes Garcia-Otero's declaration that "a program of IVF and embryo transfer is legitimate, scientific, legal and ethically irreproachable . . ."

One article on the birth of the first test-tube triplets *(La Gaceta,* June 15, 1988) reports that the

mother, Mercedes Valverde, first had an operation to remove six uterine fibroids, and then rested for a number of months during which time, she was a "prisoner in the house," as her husband, taxi driver Carmelo Sebastian put it. After recuperating, she underwent three IVF attempts, getting pregnant on the third. Three years had passed since she first consulted Dr. Otero-Garcia in his clinic.

After eight months and four days, she gave birth to triplets "which she has not been able to see, except for the photographs in the newspapers and on television."

ABC (July 14, 1988) reported the prediction by Dr. Pedro Barri, "scientific father" of the first Spanish IVF baby, that in the year 2000, one of every 10 babies born will have been conceived by IVF. "In his opinion, the proliferation of test tube babies' is favored by the elevated percentage of reproductive loss in the human species, or [the fact that] the effectiveness of reproduction only reaches 30 per 100.'"

Juan Espejo reported in *Jaen* (February 16, 1989) that Dr. Garcia-Otero's clinic, CIVTE, in Seville, had been inundated with telephone calls following the birth of a second test-tube baby to the same couple. The couple's first child, Lidia Macarena, was born March 26, 1986, and their second, Ruben Moises, January 24, 1989.

After the birth of Ruben Moises, and the publication of an article on the birth in the newspaper *Jaen,* Dr. Jesus Martinez Moreno of the IVF center said, "we are receiving a multitude of telephone calls [inquiring about IVF]. From the normal trickle of interested persons it has passed to an authentic boom."

Speaking of the Catholic Church's response to IVF, Dr. Garcia-Otero is quoted: "The Church, wise and prudent, does not oppose, does not condemn these technologies. No official document exists in this sense."

(In fact, the Church had earlier published a widely publicized official document critical of IVF entitled, "Instruction on Respect for Human Life in its Origin and on the Dignity of Procreation." The reporter does not question Dr. Garcia-Otero on this.)

Garcia-Otero continued:

> "What it [the Church] does, and for this reason it is wise and prudent, is put [us] on guard, warn of the dangers these technologies would have if they were used badly by men without scruples and with purposes distant and different from those which [are now] pursue[d]: to cure an illness."

Reporter Juan Espejo writes that *Jaen* and its province "is dreaming of the modern genetic technologies since it has formally known of the birth of Ruben . . ."

Garcia-Otero reported his percentage of IVF pregnancies as oscillating between 22 and 26%, depending on the group of patients and their ages. (In a May 1988 newspaper article, nine months earlier, the rate had been reported as 18–24%, making it unclear whether the rates given are those for the clinic's entire experience with IVF or only for a limited time period.)

In 1988, Garcia-Otero added, his center had a 25.3% rate for IVF pregnancies.

"It is necessary to point out, however," he added, "that the percentage indicated is close to that of nature itself in normal pregnancies of the human couple."

In an article by Marta Cervera in *Protagonistas* (March 1989), Anna Veiga, biologist in the IVF team at Dexeus, said her team had a pregnancy rate of 25 to 30%. "The success does not depend solely on us," she told the magazine, "but also on the age of the patient and on whether the semen is fertile or not."

Asked what she was working on now, Veiga said, employing understatement: "I'm very interested in the freezing of eggs because this is something that has not yet been perfected, since the technique does not function 100%."

Ramon Balmes reported in *La Vanguardia* (April 24, 1989) that the king and queen of Spain, Carlos and Sofia, had visited the mother of Spain's test-tube quadruplets in the clinic Dexeus. While visiting a relative in the clinic, the royalty were informed of the birth of the babies.

A story by Jose Manuel Martinez in *ABC* (May 3, 1989) detailed the childcare and economic problems of the quadruplet's parents, Elena Marin, a bank employee, and Jose Molina, an electrician. Elena explained: "It's not going to be easy to go forward with the four babies, because it will be necessary to count on the help of more than one person to take care of them and that costs money." She added that they would also have problems with space as their apartment was small.

She had sought the assistance of social services, she said, but had been told the most she could get would be help for one hour a day. That, she said, was no help at all since she was in the bank all day until 3 p.m. and her husband did not return home until 10 p.m.

Jose emphasized that no institution, public or private, has offered them any help at all.

Deborah Hap wrote in *Diari de Tarragona* (July 16, 1989) that an estimated 13 to 15% of couples can not have children, compared to 5 to 6% in the 1970s. According to the experts, she wrote, the cause of the increase in sterility is the great increase in sexually transmitted diseases and inadequate control over those diseases.

Instituto Dexeus joined the many IVF clinics that have used a technique developed by a public relations company: inviting the press to a party for test-tube babies and parents. (See *IRAGE* 3(1): "Public relations firm explains how it sells IVF to the public for its client, the company IVF Australia.") An article by Francesc Relea in *El Pais* (December 3, 1989) reported that some 170 children of the 260 born in Spain through IVF attended a party the day before organized by the Instituto Dexeus of Barcelona in a discoteque in Gava. The organizers of the party took up a collection during the party for the organization Doctors Without Frontiers, which provides medical care in Third World countries.

The collection was taken up in an attempt to show that "a technological medicine can understand the situation of those countries of the Third World that do not have access to such medicine," as Santiago Dexeus, one of the leaders of the Instituto Dexeus, explained to *El Pais.* He added: "The party [for test-tube babies] has a very human and very agreeable connotation. We are working to create a more humanized society."

Several articles deal with the law on the new reproductive technologies passed in October 1988. *El Independiente* (March 23, 1989) stated that with these new laws "our country has been one of the first to end the legal vacuum produced by the rapid advances in biomedicine and biotechnology."

The law allows experimentation on embryos up until the 14th day of its development. The article explains the rationale for distinguishing between a 14 and a 15-day-old embryo.

> "This 'frontier' between the embryo, which is granted full rights, and that which is termed 'preimplantation embryo,' which is granted a lesser degree of protection, in the opinion of the principal proponent of these laws, the socialist Marcelo Palacios, follows [from the fact that] nobody denies that both are carriers of life, but not to the same degree.' In this way, 'human life, before the 14th day, is a mass of undifferentiated cells, not yet securely implanted in the uterus, so that it would be difficult for it to receive the same consideration as that which is termed an embryo, that begins to develop its organs and can be considered to be a being undoubtedly in gestation.'"

In *La Vanguardia* (April 18, 1989), Alfonso Balcells Gorina quotes pathologist Herranz, vice-president of the Ethical Commission of the Association of European Physicians: "What is it that happens between day 14 and day 15 of [the embryo's] existence? Evidently nothing that can compare in importance with what happened in the previous days. To call it a 'pre-embryo' on day 14 and an 'embryo' on day 15 is simply an arbitrary act which is scientifically unjustifiable."

On the new laws in general, Balcells Gorina comments: "It's curious that a certain hurry has existed to legislate on this theme, with Spain moving ahead of almost all the other countries. Aren't there more urgent problems?"

1982. Dos equipos catalanes compiten por el primer "bebe-probeta" espafiol. *El Pais.* November 14; 1984. El primer "bebé probeta" varón español nacerá en Noviembre de un parto gemelar. *El Pais.* September 20; 1984. Los primers "gemelos probeta" españoles nacieron anoche en Barcelona. November 1; 1985. El quinto "bebé" probeta," una niña, nació en Astruias. January 2; 1985. Un doctor madrileño asegura que está congelando embriones humanos desde hace cuarto meses. *El Pais.* January 10; 1985. Los médicos no comprenden el secreto de las investigacions. *El Pais.* January 10; 1986. La "niña probeta" andaluz se llamrá Lidia. *El Pais.* March 29; LEONOR TABOADA. 1987.

Comerciar con embriones humanos. *El Pais.* April 11; CONCHA EDO. 1988. La fecundación artificial retrasa el avance del tratamiento natural de la esterilidad. *Ya.* January 4; JOSE MARIA FDEZ.-RUA. 1988. Fertilizción "in vitro": los primeros trillizos de Espana nacerán en Sevilla. *ABC.* May; ALICA JASANADA. 1988. Un estudio revealа los traumas de las parejas cunado recurren a la fecundación in vitro para ser padres. *La Vanguardia.* May 10; 1988. Nacieron los primeros trillizos españoles fecundados "in vitro." *El Correo Gallego.* June 14; JUAN MENDEZ. 1988. Nacen en Sevilla los primeros trillizos fecundados "in vitro" en España. *El Pais.* June 4; 1988. Trillizos "in vitro" para Sevilla. *La Vanguardia.* June 14; ROSARIO GARCIA GOMEZ. En el año 2000, uno de cada diez niños nacerá por fecundación in vitro. *ABC.* July 14; JUAN ESPEJO. 1989. Jaén sueña con la genética tras el nacimiento del niño probeta Rubén. *Jaen.* February 16; MARTA CERVERA. Anna Veiga: la emoción de ser madre. *Protagonistas.* March 18; 1989. Una mujer da a luz cuatrillizos tras la implantación in vitro de tres embriones. *La Vanguardia.* April 23; RAMON BALMES. 1989. Los reyes visitan a los padres de los cuatrillizos que nacieron de una fecundación "in vitro" en Barcelona. *La Vanguardia.* April 24; JOSE MANUEL MARTINEZ. 1989. Cuatro vidas compensan los problemas psicológicos de la fecundatión in vitro. *ABC.* May 3; 1989. Mas de 300 niños han nacido en España por fecundación asistida. *Diario de Teruel.* July 14; PILAR DEL BURGO. 1989. Mil parejas están en lista de espera en los hospitales públicos de Valencia para tener un "bebé probeta." *Levante: Diario Regional Valenciano.* July 15; DEBORAH HAP. 1989. Casi 300 niños han nacido en España gracias a la fecundación artificial. *Diari de Tarragona.* July 16; CHRISTINA PRIETO. 1989. Hay un alto índice de fracaso en los métodos de maternidad artificial. *Ideal.* November 11; 1989. Primer "bebé probeta" implantado en las trompas. *El Periodico.* November 17; FRANCESC RELEA. 1989. Mas de 150 "bebés probeta" de toda España se congregan en una fiesta del Instituto Dexeus. *El Pais.* December 3; ANA RAMIL. 1989. España, laboratorio genéticoe Europa. *Atlantico Diario.* February 16; MARISA REAL. 1989. Fecundación artificial ante la ley. *Faro de Vigo.* February 16; J. S. T. 1989. Dos leyes pioneras en el campo de la bioética. *El Independiente.* March 23; ALFONSO BALCELLS GORINA. 1989. La ley de reproducción asistida. *La Vanguardia.* April 18.

EMBRYO EXPERIMENTATION

Embryo diagnosis approved and then banned in Australia

"An Australian parliamentary committee has approved a controversial request by scientists at the Monash Medical Centre in Melbourne [Australia] to test human embryos obtained for in vitro fertilization (IVF) for birth defects before implanting them in patients," Tania Ewing of *Nature* reports.

One cell will be removed after allowing the embryo to grow to the four-cell stage (two days after fertilization). This cell will be tested for genetic defects.

Religious and ethical groups raised voices of protest and applied pressure to the government of Victoria, according to *Nature.* The state government decided to overturn the decision, sparking one member of the parliamentary committee to resign in protest.

The experiment would have been carried out on 11 embryos by the research group headed by Alan Trounson.

TANIA EWING. 1989. Testing of in vitro embryos approved. *Nature.* 337: 295; CHARLES MORGAN. 1989. Human embryo experiment banned. *Nature.* 338: 447.

Embryos sex-tested in England

One cell from thirty three-day-old embryos was removed and tested to reveal the sex of the embryos. Researchers say the embryos were donated by women undergoing IVF at Hammersmith Hospital in London.

The genetic material in each cell is not enough to carry out such tests, but a new method called the polymerase chain reaction (PCR) can rapidly multiply the genetic material from one cell to make millions of copies. This produces enough material to carry out genetic tests.

The researchers at Hammersmith Hospital are seeking approval from the hospital and from the Voluntary Licensing Authority so they can use the technique. It will only be available for couples using IVF.

GAIL VINES. 1989. Early embryo sex test forewarns of disease. *New Scientist.* February 25: 25.

Embryo bill in Great Britain still on hold

"As the British government continues to delay the introduction of legislation on assisted fertilization and embryology, both those bodies which support research and those which oppose it are becoming frustrated," *Nature* reports. The Voluntary Licensing Authority (VLA) is also finding its workload increasing but not its budget.

The VLA is responsible for monitoring IVF programs and approving embryo research projects. The VLA is getting frustrated and tired by the delays in legislation and would like to change its name to the Interim Licensing Authority to emphasize that a permanent authority is needed.

CHRISTINE MCGOURTY. 1988. Pressure on UK for embryo bill. *Nature.* 336: 505.

Smuggling using embryo implantation

The best mohair wool comes from Angora goats in South Africa. Export of the goats is banned so South Africa holds a near monopoly on trade with mohair.

Several Australian farmers were interested in smuggling a herd to Australia. They raised money and bought 269 Angora and Boer goats and on Christmas Eve succeeded in smuggling them across the border to Zimbabwe.

Once there "the Australians bred the goats and collected almost 400 embryos which were frozen and flown to the Australian Government offshore quarantine station," *Nature* reports. There the embryos were to be implanted in surrogate goats but the farmers broke up their partnership and sold the embryos to Embryotech.

The embryos were transferred to New Zealand where they were implanted to create a herd containing Angora goats. The goats are in quarantine for 7 years but after the time limit the company is hoping to increase the number of offspring using embryo transfer and offer the goats for sale.

TANIA EWING. 1989. 20th-century smugglers use biotechnology. *Nature.* 337: 5.

INFERTILITY CAUSES

Sperm quality has decreased in Sweden since I960

The quality of sperm has declined dramatically during the past 20 to 30 years, according to several studies conducted in the 1960s, 1970s, and 1980s. These results were presented at a recent conference in Lund, Sweden.

Several possible causes were discussed. Animal studies have shown that increased stress reduces the production of sperm. This could also be true in men. Illness is one type of stress that is known to affect some mens' fertility.

Other possible causes might be related to environmental toxins and other environmental influences such as magnetic fields. One study has also shown that men's fertility declines rapidly after the age of 35.

SIGRID BOE. 1989. Dålig sperma drabbar allt fler. *Dagens Nyheter* (Stockholm). January 29: 6.

ARTIFICIAL INSEMINATION

Single women have right to child support after insemination

A single woman who gave birth after artificial insemination has won an appeal against the Swedish social welfare authorities. The social welfare authorities refused to pay the woman government child support citing a Swedish law that states that the father's identity must be revealed even after insemination by donor sperm.

The woman was inseminated in Denmark where donors are anonymous, which made it impossible for her to give the father's name. Government child support is automatically paid to single mothers where the father does not pay tosupport the child.

The Insurance High Court has now ordered the social welfare authorities to pay the woman child support retroactive to July 1984. Thor Sverne, member of the committee that wrote the law which refuses anonymity to sperm donors, hopes the appeal does not set a precedent. "The danger of course is that anyone can say that they've been to Denmark," Sverne states.

MONICA BENGTSON. 1989. Inseminerad far bidrag. *Dagens Nyheter* (Stockholm). January 25: 18.

BIRTH REGULATION

China hardens on birth control policy

Chinese officials have been considering relaxing their one-child per family policy but have now decided that the population is growing too fast and more drastic measures have to be taken. In Beijing, one resident states that "The authorities make you have an abortion if you get pregnant a second time," *New Scientist* states.

Rural couples have been the major group to ignore the one-child policy since they need the help of their children and are rich enough to pay the fines for having more than one. At least half of the provinces "allow peasants to have a second child if the first is a girl or is handicapped," *New Scientist* reports.

CATHERINE SAMPSON. 1989. China to toughen its grip on birth control. *New Scientist.* February 4: 28.

French abortion pill under attack

The U.S. National Right to Life Coalition is threatening to boycott products made by the French company, Roussel-UCLAF, if they do not withdraw the abortifacient RU-486 from the market. The French Health Ministry approved the pill for use in abortion clinics in France in 1988.

The pill may only be taken under strict medical supervision and the woman must also take prostaglandins. Without prostaglandins the drug is not as effective and can lead to incomplete abortion.

PETER COLES. 1989. French drug under attack. *Nature.* 338: 367.

New sterilization law meets protests

"A proposed new law that would make it legal to sterilize people judged mentally incompetent without their consent has prompted a vigorous protest in West Germany [Federal Republic of Germany] from those who fear the law might some day be used to justify enforced sterilizations of a broader class of people," states *Nature.*

The legislation is part of a package of reforms for mentally handicapped people. Most of these are positive changes since current law equates mentally handicapped persons with children, but the sterilization law contains a loophole that "permits the sterilization of people who do not specifically object in cases where pregnancy would create an 'emergency situation,'" *Nature* writes.

Protests have come from handicapped rights groups, members of the Green Party as well as an organization of judges. They plan to fight the law in Parliament where it will be discussed during the fall.

STEVEN DICKMAN. 1989. Sterilization protests. *Nature.* 338: 192.

FETAL TISSUE

Fetal tissue research gets OK in U.S.A.

The Human Fetal Tissue Transplantation Research Panel has presented its final report to the National Institutes of Health Advisory Committee. The committee recommends allowing the use of tissue taken from aborted fetuses in research.

However there should be a ban on selling such tissue and a woman's decision to have an abortion should not be linked in any way to her giving consent to donating the fetus to research. The guidelines come at a time when researchers are already transplanting fetal cells into patients.

BARBARA J. CULLITON. 1988. Panel backs fetal tissue research. *Science.* 242: 1625–1626.

Genetically engineered cells may replace fetal tissue

It may not be necessary to use fetal tissue transplants to treat Parkinson's disease in the future. Researchers from the U.S. and Sweden have taken skin cells from rats and genetically manipulated them using a retrovirus to make them produce human nerve growth factor (NGF). These cells were grafted into the damaged brains of rats.

The researchers hoped the skin cells would produce NGF which stimulates the growth and regeneration of nerve cells. Such stimulation could theoretically restore damaged parts of the brain. The experiment showed that the grafts survived. The researchers now want to test the method on primates.

STEPHANIE YANCHINSKI. 1988. Fetal tissue may not be needed for Parkinson's. *New Scientist.* December 3: 32.

GENETIC ENGINEERING

EEC proposal raises fears of neo-eugenics

The EEC is making 10 million British pounds available for research in human genetics. The European Parliament wants the program to be open for scrutiny by the public so as to prevent the unethical use of genetic information.

The money will be used to set up two European networks, one to prepare a library of human DNA based on cloned segments and one to work on the linkage map of the human genome. This will be done by studying 60 large families.

"The ultimate aim of the project is to use the data generated to predict which people are predisposed to which diseases," states *New Scientist.* This has led to outcries of neo-eugenics.

An editorial in the same issue of *New Scientist* takes a critical stand and states:

> "Some human diseases, the proposal says, are caused by single defective genes. However, the real problems, it says, are the 'multifactorial' diseases. Some people have genes that result in a tendency to develop arthritis, ulcers, diabetes, depression or heart disease more often than others, in response to environmental factors.
>
> "But then the project's scientists go beyond science. The environmental factors cannot be changed, they say, so we have to work on the genes. The report says that the point of studying human genes is to 'protect individuals from the kinds of illnesses to which they are genetically most vulnerable, and where appropriate, to prevent the transmission of genetic susceptibilities to the next generation'. Where appropriate indeed. Picture what an insurance company could do with an estimate of your 'genetic susceptibilities', and you are not far from taxing people for carrying 'bad' genes."

1989. Fear of 'neo-eugenics' hits Europe. *New Scientist.* February 4: 23; 1989. A spectre from the 1940s. *New Scientist.* February 4:21.

More countries join human genome project

Although the United States leads the huge research project to map the human genome a number of other countries are joining up. "The Soviet Union has launched its own genome project," Leslie Roberts of *Science* states. And Japan has started on a small scale, putting most of its efforts into developing automatic sequencing machines.

Several European countries have also received some national funding. Italy is planning to map and sequence the X chromosome. On a larger scale the European Community has started a six-year effort to support research in European laboratories. Even Unesco has started a genome project.

In Great Britain, the Medical Research Council is planning to develop a "computerized database for storing and distributing data on the structure and function of the human genome," David Dickson of *Science* states.

The Council thus hopes that this will make the MRC's Clinical Research Center an important center in the international cooperation of the human genome project.

The Federal Republic of Germany has raised some doubts about the European Community project. "West German parliamentarians do not object to the substance of the programmes, but rather to their intentions, which they claim are based on eugenic principles similar to those of the Nazi movement," *Nature* reports.

"The medical justification given in the proposal has generated most of the controversy," *Nature* continues. "Genetic diseases are said to be 'distressing' and 'socially very expensive', so that the possibility of relieving or preventing them is promising."

LESLIE ROBERTS. 1988. Carving up the human genome. *Science.* 242: 1244–1246; DAVID DICKSON. 1989. Britain launches genome program. *Science.* 243: 1657; STEVEN DICKMAN. 1988. West Germany voices objections to European genome project. *Nature.* 336: 416.

Biotech firm withholds data on hepatitis test

Chiron Corporation, a biotechnology firm, "has failed to publish critical data that could lead for the first time to a test for one form of hepatitis," *New Scientist* reports. Non-A, non-B hepatitis can cause liver damage in half of those who contract the disease:

Chiron Corporation announced that they have sequenced the virus' DNA and have even developed a possible test for the disease but have not published anything. Many scientists are upset since the free flow of data has helped to identify and control hepatitis A and B. A test for non-A, non-B hepatitis could bring in 85 million British pounds per year.

1989. Withheld data blocks hepatitis research. *New Scientist.* January 14: 29.

Proposal to screen newborns for cystic fibrosis

"If doctors screened every newborn baby with a simple blood test for cystic fibrosis, it would cost substantially less to treat children with the disease than at present," *New Scientist* states.

"Doctors already take a blood sample routinely from newborn babies to test for other inherited conditions. They could test part of the same blood sample for a special form of trypsin, a digestive enzyme that is overabundant in newborn babies with cystic fibrosis."

This knowledge could then be used by the parents with their next child. Prenatal diagnosis could be performed and if the fetus was found to carry the cystic fibrosis gene, the pregnancy could be terminated.

SHARON KINGMAN. 1989. Test could help children with cystic fibrosis. *New Scientist.* March 18: 29.

Gene therapy in humans receives approval

The United States government gave final approval to the first experiment where foreign genes will be transferred into humans, according to *Science.* The experiment is being carried out by W. French Anderson and Steven A. Rosenberg at the National Institutes of Health.

The experiment had been approved earlier by an advisory committee after some controversy about some data that was withheld by the researchers.

Two weeks after approval was granted, the Foundation on Economic Trends, a public interest group, filed suit in a US federal district court to stop the experiment.

LESLIE ROBERTS. 1989. Human gene transfer test approved. *Science.* 243: 473; DAVID SWINBANKS. 1989. Rifkin tries to block human gene transfer experiment. *Nature.* 337: 398.

Future gene therapy using cells lining blood vessels

Researcher W. French Anderson at the National Institutes of Health in the United States has succeeded in producing genetically engineered endothelial cells. These cells line the blood vessels. The cells were taken from a major artery in rabbits and infected with retroviruses that contained a gene for antibiotic resistance plus a gene for rat growth hormone. The cells produced large amounts of the growth hormone in the culture medium.

The cells were then grown on an artificial blood vessel and continued to produce growth hormone. The next step will be to try to implant the cells into a living animal and see if they still secrete growth hormone.

If this works, it could lead to gene therapy in humans where endothelial cells would secrete a substance such as growth hormone continuously and directly into the blood.

1989. Cells lining blood vessels respond to foreign DNA. *New Scientist.* February 4: 34.

Federal Republic of Germany drafting gene law

The government of the Federal Republic of Germany is drafting a new biotechnology law to close loopholes in the patchwork of voluntary regulations that now exist. The new law would make it a crime to violate any of the regulations.

The law is expected to be presented sometime in the fall of 1990. It will define "levels of danger" for experiments. Contained experiments and those with low danger levels would be dealt with by the individual states. High risk experiments would have to be approved by the national government. Environmental release of genetically modified organisms would be reviewed by a state commission for danger to humans and the environment before being approved.

STEVEN DICKMAN. 1988. German cabinet promises gene law but problems remain. *Nature.* 336: 611; DON KIRK. 1988. Germany drafting biotechnology law. *Science.* 242: 1376.

Britain working on law for environmental release

The British government will probably introduce legislation to control the release of genetically modified organisms into the environment by the end of 1989. The legislation would replace voluntary guidelines that now govern researchers wanting to test transgenic plants and animals in the environment.

"The law would force researchers to notify the Health and Safety Executive of planned experiments outside the laboratory 30 days before the work began," *New Scientist* reports. Researchers would also be obliged to carry out risk assessment studies on the possible impact of such environmental release.

1989. Law to contain engineered organisms. *New Scientist.* January 28: 27.

U.S.A. gene rules wither

"Are the Environmental Protection Agency's (EPA) long-awaited rules governing the release of engineered microorganisms dead?", *Science* asks. They may very well be since "outgoing administrator Lee Thomas failed to get the rules published before he left office, despite the urgings of the agency's Biotechnology Science Advisory Committee."

There are now fears that the rules may be delayed for years. "The rules would expand the definition of commercially related releases of altered organisms that would require regulatory approval. Research conducted by universities would be considered commercial when it involves a joint venture or other financial relationship with a private company."

The Association of Biotechnology Companies and the Industrial Biotechnology Association opposed the new rules. They feel that "there should not be a presumption of risk with engineered organisms," *Science* states. Otherwise small companies and universities will be overburdened.

MARK CRAWFORD. 1989. Biotechnology rules wither in OMB. *Science.* 243: 602.

France drafts bioethics law

The French government is introducing a broad bioethics law, "defining how the 'dignity of the individual' should be protected in an age of rapidly advancing medical technologies," *Science* reports. The law would make illegal the sale or trade of human organs and would continue the ban on surrogacy.

The law would also make illegal human embryo research after 7 days unless special permission were obtained from the National Ethical Committee to extend the time limit to 14 days. "Although scientists will be forbidden to create fertilized embryos for any reason apart from a parental desire for procreation, potential parents will be permitted to donate unwanted embryos for research purposes," *Science* states.

However the law states that such research is not allowed to "threaten the integrity of the human race or lead to eugenic practices."

DAVID DICKSON. 1989. France introduces bioethics law. *Science.* 243: 1284.

DNA fingerprinting to track kidnapped children in Argentina

DNA fingerprinting is being used to identify children who were kidnapped in Argentina when their parents were made to "disappear." Such children were often put up for adoption and have lost contact with their biological relatives.

In many cases, many members of the family are already dead or are very old, making identification difficult. A group of grandparents has "established a bank of DNA from themselves and relatives of children thought to have been abducted from parents who disappeared." *New Scientist* states. This will give children who suspect they were kidnapped a chance to find their biological famines again.

1989. DNA points the finger at Argentina's past. *New Scientist.* January 28: 29.

Natural hormone could give athletes an edge

Erythropoietin (EPO) is a hormone produced by the kidneys that stimulates the production of red blood cells. EPO is now commercially available and is produced by the biotechnology company Amgen.

EPO is meant for patients using dialysis machines who suffer from severe anemia, but could be taken by athletes to improve their performance. EPO produced by genetic engineering is indistinguishable from that produced naturally in the body and thus makes detection almost impossible.

However, EPO is toxic if taken in high doses and can cause strokes, making it a potential killer in untrained hands.

STEPHANIE YANCHINSKI. 1989. Hormone could keep track cheats one pace ahead. *New Scientist.* March 4: 26.

Japan markets another hepatitis vaccine

"Japan's Chemo-Sero-Therapeutic Research Institute (Kaketsuken) plans to export a newly developed recombinant hepatitis-B vaccine to South-East Asia and China," *Nature* reports. Hepatitis-B is a major cause of cancer in these countries.

A patent for the vaccine is being applied for. The market for the vaccine is huge and will bring the owners of such a patent substantial income.

DAVID SWINBANKS. 1989. Another vaccine enters the fray. *Nature.* 337: 106.

Five-minute AIDS test developed

A five-minute AIDS test has been developed by Cambridge Bioscience using genetic engineering methods. The test is called Recombigen and is based on a protein coded for by part of the HIV virus which causes AIDS.

The gene from the virus has been inserted into bacteria that then mass produce the protein. Small latex beads are then coated with the protein. When a drop of blood is mixed with the protein-covered beads, the beads clump together if the blood contains antibodies to HIV.

There is a risk of false-positive reactions. The test has been approved in the USA but will not be available over-the-counter.

CHRISTOPHER JOYCE. 1988. Five-minute AIDS test cleared in US. *New Scientist.* December 24/31: 6.

Clot-dissolving drugs— which is best?

The clot-dissolving drug tissue plasminogen activator (TPA) was approved for use in treating heart attacks in the USA in 1988. Since then, a controversy has raged over whether or not the drug is really as effective as is claimed.

TPA is 10 times as expensive to use as many other drugs as well. Clinical trials are being held comparing TPA with other clot-dissolving drugs and so far show that the commonly used drug streptokinase is as effective as TPA.

Previous tests showed TPA to be much more effective. But allegations have been made that many of the doctors carrying out these early tests owned stock in Genentech, the company that produces TPA. This has raised questions of conflict of interest in the studies.

JEAN L. MARX. 1988. Which clot-dissolving drug is best? *Science.* 242: 1505–1506.

Rules for work on transgenic animals in Britain

The British Health and Safety Executive (HSE) has developed safety guidelines for "creating, breeding or handling transgenic animals," *New Scientist* reports. The HSE report outlines rules for preventing the release of genetically manipulated organisms or the viruses used to create them into the environment.

"The HSE wants all work on transgenics which falls within the definition of genetic manipulation to be notified to a local Genetic Manipulation Safety Committee," *New Scientist* states. "This committee will then assess the risks and assign the research into one of four risk categories."

The HSE would also like to require licensing of those creating transgenic animals.

STEVE CONNOR. 1989. A shepherd for transgenic animals. *New Scientist.* January 21:25.

Transgenic animals discussed in U.S. report

"Animal rights, the release of genetically engineered organisms into the environment, and the effects of large agribusiness companies on the farming industry are the real issues behind the debate over the patenting of animals," *Nature* states. These are the conclusions of a report (New Developments in Biotechnology-Patenting Life) published in March 1989 by the U.S. Office of Technology Assessment (OTA).

OTA states that animal patenting can be dealt with using existing regulations but "the ethical question of whether or not transgenic animals should be subject to patents is a question that may need further clarification," *Nature* reports. There are now 44 patent applications for transgenic animals at the US Patent Office and animal rights groups have not been able to overturn the decision to allow animal patents.

CAROL EZZELL. 1989. Transgenic sticky issues. *Nature.* 338: 366.

First field-test of genetically engineered fish approved

The field test of a genetically engineered carp has been approved by the U.S. Department of Agriculture biotechnology review board. The carp have been engineered to contain trout growth hormone genes so that they grow larger than normal. The test will take place in a contained pond with barriers to keep the carp from escaping.

CAROL EZZELL. 1989. New carp park ahead. *Nature.* 338: 366.

Mouse engineered to contain human immune system

Two research groups have succeeded in transplanting human immune system cells into mice with severe combined immunodeficiency (SCID).

SCID mice are used in research to study a similar disease in humans. The human cells function in the mice which makes them "work like little humans," *New Scientist* states.

The mouse will be mass-produced to meet the demand for research. The mouse can be used for testing treatments that would be unethical to try on humans, such as in AIDS research. The researchers are also applying for a patent on the mouse.

IAN ANDERSON. 1989. A mouse with a human immune system. *New Scientist.* January 14: 33–34.

Genetically engineered silk worms

"Researchers in the French city of Lyons are waiting anxiously for the moment this summer when a batch of silkworm larvae emerges as moths," *New Scientist* reports. "When the moths mate, their offspring will be the subject of intense scrutiny among academics and biotechnology companies.

The scientists want to know whether the new generation of silkworms will carry the foreign genes injected into the parent insects while these were still embryos. The eventual aim is to propagate generations of silkworms which would produce valuable proteins such as interferon or insulin in their silk."

1989. Silkworm becomes the moth of invention. *New Scientist.* March 11: 38.

Genome projects for plants planned

The U.S. Department of Agriculture is backing a plan to map the genes of important agricultural plants. The major impetus for the plan is to "maintain U.S. competitiveness in world agricultural markets," *Science* states. The size of the project is still undefined.

Researchers in Britain are hoping that a simple weed, thale cress or *Arabidopsis,* will play the same role for plant genetics that the fruit fly, *Drosophila,* has played for animal genetics. According to *New Scientist,* researchers at the Institute of Plant Science Research in Norwich plan to use thale cress to find new genes that may make other crops resistant to pests. Thale cress has about one tenth the genetic material that flowering plants have and this will make it easier to study.

MARK CRAWFORD. 1989. Yeutter backs plan to map crop genes. *Science.* 243: 1137; STEVE CONNOR. 1989. Simple weed could hold key to genetics. *New Scientist.* February 4:38.

Plant crops begin to yield to biotechnology methods

Previously, only a small group of plants have been successfully manipulated using genetic engineering techniques. These belong to the family of dicots and include tomato, tobacco, and petunia plants.

The monocots, which include all the major cereal crops, are not as easily manipulated, but this is now changing. Some scientists are now predicting that they will be able to genetically engineer any crop plant within the next two years.

Rice has successfully been altered and corn (maize) has recently been engineered to produce a bacterial toxin that kills insects. The goal is to create corn that can withstand the corn borer, a major pest for the U.S. corn crop. Wheat has still not yielded to genetic engineering methods.

1989. Biotechnology charges ahead into the crop fields. *New Scientist.* January 28: 34.

Field test of genetically engineered organism approved in FRG

The Federal Republic of Germany has approved the first field test of a genetically engineered organism. The Max Planck Institute received permission to plant 37,000 genetically engineered petunias in a field at the institute.

The petunias have been engineered to contain a gene from maize. The researchers are studying "jumping genes" which are parts of the genetic material that are able to change places on chromosomes. The maize gene makes the white petunias pink in color. If a petunia gene "jumps" to where the maize gene is, a white spot will form on the pink petals of the petunia.

Some politicians feel that the approval should have been put off until legislation has taken effect. "Christa Knorr, a molecular biologist with the Green party, says: The necessity for the deliberate release stems from political rather than scientific reasons. This experiment with nice garden flowers is meant to habituate the German public to future release experiments.'"

ROLF ZELL. 1989. Mutant petunias join the wild bunch in Germany. *New Scientist.* March 11: 29.

Gene technology in food

"The Food and Drug Administration in the United States is drawing up safety guidelines on the use of organisms in food which have had their DNA altered to produce useful 'natural' proteins," *New Scientist* states. Researcher Susan Harlander, University of Minnesota, claims that "her work could lead to safe bacteria, which, when added to food, will produce natural bactericides as

alternatives to food preservatives, and enzymes which can reduce cholesterol." As a first step, Harlander has carried out experiments testing markers in a bacterium (*Lactococcus lactis*) which is found naturally in milk, meat, and vegetables.

ROLF ZELL. 1989. Safe bacteria developed for food of the future. *New Scientist.* March 4:35.

Biotech pesticide now on sale in Australia

"The world's first commercial pesticide based on a live, genetically engineered organism is now on sale in New South Wales in Australia," *New Scientist* reports. "The department of agriculture in the state cleared the product for sale without having asked to examine toxicological or safety data from Bio-Care Technology, the company that manufactures 'NoGall'. Gary Bullard, a director of Bio-Care, said that the product – which protects stone fruits, nuts and roses from crown gall disease – was registered as a pesticide with 'no questions asked' by the department." Bio-Care has also sought approval of the pesticide from the US Environmental Protection Agency and hopes to soon be able to sell "NoGall" there as well.

BRETT WRIGHT. 1989. Gene-spliced pesticide uncorked in Australia. *New Scientist.* March 4: 23.

U.S. ecologists urge caution with release experiments

A group of U.S. ecologists within the Ecological Society of America have published a report that tries to address the problems and risks of environmental release of genetically modified organisms (in *Ecology,* April, 1989). The report includes an attempt to classify different types of qualitative and quantitative information to create a scheme that could estimate ecological risk.

The information would include the known ecology, behavior, and biology of the test organism, information on the gene that is being added or changed, possible changes that may occur after genetic alteration, etc. The Ecological Society recommends that field tests be assessed on a case-by-case basis.

A number of environmental groups have approved of the report including the National Wildlife Federation, Friends of the Earth and even the Foundation of Economic Trends.

CAROL EZZELL. 1989. Truce on the US horizon for engineered organism releases. *Nature.* 337: 681; LESLIE ROBERTS. 1989. Ecologists wary about environmental releases. *Science.* 243: 1141.

Ecologists criticize genetic engineers

At a meeting in Brussels, ecologists from the United States criticized genetic engineers "for not taking ecological principles into account in predicting risks from genetically modified organisms (GMOs)," *New Scientist* reports.

Ecologist Phillip Regal from the University of Minnesota is one of the authors of a report on possible risks of such releases into the environment that the Ecological Society of America has published. He states: "In principle, one can do much better than gamble with the environment. One can establish criteria for higher and lower levels of risk."

Regal was also critical of molecular biologists' arguments, stating that they were outdated and incorrect. One such misconception "is that if genetic modifications were adaptive enough to persist, they would exist already," *New Scientist* states. "Any novel genetic modification must, therefore, be likely to die out. The argument assumes that every genetic possibility has already occurred-an idea that, says Regal, mathematical genetics disprove."

1989. Gene engineers "should study ecology." *New Scientist.* March 4: 23.

British Natural History Museum plans DNA database

The British Natural History Museum is planning to start a DNA sequencing lab. The lab would then sequence and study the genetic material from plant and animal specimens in the museum's collections.

This information will then be put into a DNA database. The database would provide information for taxonomy and phylogeny studies.

HENRY GEE. 1988. Natural History Museum to build DNA database in London. *Nature.* 336: 707.

Genetic engineering a threat to biological warfare convention

"The military potential of toxic agents created through biotechnology threatens both the Biological Weapons Convention of 1972, which outlaws biological and toxic weapons, and the Geneva Protocol on arms control," *New Scientist* reports.

"Keith Yamamoto, a biochemist at the University of California, San Francisco, believes that the threat would recede if the U.S. Department of Defense transferred all its research on biological agents to the National Institutes of Health." Other scientists at a meeting in San Francisco urged that work should be started to ensure that all nations sign the Biological Weapons Convention when it is reviewed in 1991.

Scientists should be open about any research they do for the Defense Department. Several urged their colleagues to refuse to do "research or teaching that would further the development of biological, toxic, or chemical weapons," *New Scientist* states. A petition is currently circulating where scientists who sign pledge to do so.

1989. Biotechnology outstrips convention on biological weapons. *New Scientist.* January 28: 30.

Veterinary school accepts military research money

The veterinary school at the University of Bristol has received a grant of 250,000 British pounds to study how infectious bacteria in the air infect animals. The grant has caused two staff members to resign in protest.

The research group had first applied for money from the Agricultural and Food Research Council to continue studies of how airborne bacteria in barns and stables cause illness in farm animals. The species of bacteria they were studying cause respiratory infections in animals.

Their application was refused so they rewrote it and submitted it to the Ministry of Defence (MoD) where it was approved. The major change was in the bacteria to be studied.

The MoD project focuses on the bacteria *Klebsiella pneumoniae,* which causes pneumonia and sometimes death in people, not animals. The researchers are planning to develop an "artificial lung" and the work is considered "directly transferable to human being," *New Scientist* states.

1988. Defence money supports farm research. *New Scientist.* December 3: 27.