

EIGHTEEN

Postmodern Procreation: A Cultural Account of Assisted Reproduction

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What is in crisis here is the symbolic order, the conceptualisation of the relationship between nature and culture such that one can talk about the one through the other. Nature as a ground for meaning can no longer be taken for granted if Nature itself is regarded as having to be protected and promoted.

-MARILYN STRATHERN, *After Nature*

Popular conceptions of new reproductive technology often take as their starting point the birth of Louise Brown, the world's first "test-tube baby," born in Oldham, Lancashire, in July 1978. From an anthropological perspective, this conception story is an overdetermined one. With the birth of Louise Brown also came into being a new kind of public debate about conception, in which unprecedented procreative possibilities raised moral uncertainty and political controversy. Both the moral issues and the political implications remain controversial today. In the process of formulating legislation, for example, considerable concern continues to be expressed about how to establish a legitimate foundation for decision making and debate in the field of assisted reproduction.

Feminists have shared these concerns and dilemmas and have struggled to come to terms with rapid advances in the field of reproductive technology. Reproduction has long been a significant focus of feminist theory and politics because of the way in which its control has been seen as instrumental to the subordination of women in a patriarchal culture. Early feminist critiques focused upon motherhood as a patriarchal institution (Rich 1976), the medicalization of pregnancy by the maledominated medical profession (Donnison 1977; Ehrenreich and English 1973a, 1973b, 1978), the history of birth control (Gordon 1977), and the patriarchal desire to control the reproductive process (Firestone 1970, O'Brien 1981). To these and many other early feminist accounts of reproductive politics has since been added a substantial body of feminist analysis concerned specifically with the emergence of new reproductive tech-

nologies. The 1980s saw the launch of a major feminist challenge to new forms of reproductive control in a spate of anthologies (Arditti, Duelli-Klein, and Minden 1984; Baruch, D'Adamo, and Seager 1988; Cohen and Taub 1989; Holmes, Hoskins, and Gross 1980, 1981; Homans 1986; Klein 1989; Overall 1989; Purdy 1989; Spallone and Steinberg 1987; Stanworth 1987, Whiteford and Poland 1989) and a number of pathbreaking monographs (Corea 1986; Hartmann 1987; Lasker and Borg 1989; Martin 1987; Overall 1987; Petchesky 1984 [rev. ed. 1990]; Rothman 1986, 1989; Spallone 1989). This trajectory of critical feminist analysis continued to accelerate into the 1990s, resulting in a substantial collective assessment of what is at stake in the rapidly expanding field of reproductive and genetic engineering (Adams 1994; Bartels, Priester, Wawter, and Caplan 1990; Birke, Himmelweit, and Vines 1990; Holmes 1992; McNeil, Varcoe, and Yearley 1990; McNeil and Franklin 1993; Petchesky 1990; Ragoné 1994; Raymond 1993; Rodin and Collins 1991; Rowland 1992; Scutt 1990; Spallone 1992; Stacey 1992; Strathern 1992a, 1992b; Wymelenberg 1990).

Such a degree of feminist concern is hardly surprising given the pace at which developments in reproductive science and medicine are currently being made and the rapidity with which innovations in this busy field become routine. And it is also not surprising that feminist attention to the political implications of new reproductive and genetic technologies has been so intense, given the pace at which the reproductive process is being radically redefined and reshaped. Yet increasing feminist anxiety about this field of patriarchal pioneering on the "frontiers" of human, plant, and animal reproductive processes is accompanied by a notable degree of confusion about feminist strategies for change.

Without having achieved many of the basic feminist goals in the area of reproductive politics, such as access to free and safe abortion, feminists have been troubled and divided by a score of new reproductive dilemmas. Though much ink has been spread over these issues in the way of feminist analysis, few feminist campaigns have succeeded in mobilizing effective forms of direct collective action against what are seen as quite threatening new forms of reproductive control. In spite of having emerged in the midst of a powerful feminist movement, which had become increasingly international and to which reproductive concerns were central, reproductive technology has proved a difficult area in which to formulate effective feminist strategies of resistance.

This is not to deny that substantial efforts have been made nor to diminish real accomplishments. Feminists in India, for example, successfully fought to prevent the use of amniocentesis to abort female fetuses. Feminists in Germany and Australia have been particularly effective in at least making their voices heard in public debate if not always in success

fully shaping its outcome. In Canada, feminist perspectives have been well represented as part of a Royal Commission mandated to determine regulatory guidelines for new reproductive technologies, though its final recommendations are still pending. International feminist networks, such as the Feminist International Network of Resistance to Reproductive and Genetic Engineering (FINRRAGE) and the Global Network for Reproductive Rights, have mobilized considerable support but are also indicative of the problems for feminists insofar as they (especially FINRRAGE) have been subject to considerable criticism by women who oppose their actions or analysis.

There are several reasons for the difficulties feminists have encountered. They correspond to shifts both within the feminist movement, such as an increasing emphasis upon differences among women, and within the political climate more generally, such as the increasingly global hegemony of the enterprise culture, the rise of fundamentalism, and the increasing disparities characterizing various forms of domestic and international inequality.

Hence, at the same time that reproductive politics have become the focus of increased feminist attention, the meaning of reproductive politics has both expanded and diversified, resulting in a loss of certainty about preexisting feminist strategies, slogans, and frameworks, particularly those grounded on notions of rights and choice (see Franklin and McNeil 1988, pp. 553-55; McNeil et al. 1991). As "reproductive choice" begins to take on whole new meanings and as fathers, fetuses, and embryos acquire increased reproductive rights, so the foundational authority, for feminism, of "a woman's right to choose" can be seen to be "In crisis" (Himmelweit 1988). That it was never unproblematic does little to mitigate the fact that this time-honored feminist slogan has lost much of its authority amidst (and has even been epitomized by) controversies such as that over Baby M, in which two women's opposing choices and rights were at issue (Snitow 1990). While such uncertainty does little to mitigate the continuing importance of traditional feminist arguments surrounding, for example, abortion rights, it is also apparent that feminists need to develop new approaches to these politics.

This chapter takes as its starting point, then, a recognition of the changing landscape of reproductive politics and the consequent need for a redefined feminist engagement with it. I argue that an appreciation of the specifically cultural dimensions of the changing construction of reproduction is critical to the maintenance of effective feminist challenges. Anthropology has a particular role to play in regard to this dimension of reproductive politics, and the work of several contributors to this collection has been exemplary in defining this approach (Ginsburg 1989, 1990; Ginsburg and Tsing 1990; Lewin 1990, 1993; Martin 1987, 1990,

1991, 1994; Rapp 1987, 1988, 1990; Strathern 1992a, 1992b; see also Edwards, Franklin, Hirsch, Price, and Strathern 1993; Cannell 1990; Delaney 1986, 1991; Stolcke 1986; Tsing 1990). So too has the work of cultural historians been important in the attempt to address the cultural implications of reproductive politics (Duden 1993; Haraway 1989, 1991; Jay 1992; Jordanova 1989; Moscucci 1990; Pfeffer 1993; Schiebinger 1989, 1993).

My argument here is concerned largely with public cultural representations and thus takes its cue from the argument first put forward by Petchesky (1987) that cultural representations, such as fetal images, have become key sites of struggle over the meanings through which reproductive politics are defined (see also Duden 1993; Franklin 1990, 1991, 1992b; Hartouni 1991; McNeil et al. 1991; Taylor 1992). Hence, in what follows, cultural frameworks drawn from anthropology and cultural studies are applied to a number of examples drawn from mainstream or public culture. In this way are combined, therefore, a traditional object of anthropological inquiry (beliefs about conception, kinship, and personhood) and more recent cultural theory in order to illustrate what are argued to be significant shifts in the cultural grounding of assumptions about the "facts of life."

REPRODUCING REPRODUCTION

Reproduction can be seen to be in the midst of a major set of cultural redefinitions and (literal) reconstructions, primarily as a result of a convergence between two branches of science—genetics and embryology—by means of which unprecedented forms of scientific "assistance" have been given to the process of reproduction and development. The reproductive processes of humans, plants, and animals are now technologically modified, monitored, managed, and marketed to an unprecedented extent (Spallone 1992; Wheale and McNally 1988, 1990). As Strathern (1992b) has described it, reproduction is being "enterprised up." The control, enhancement, and harnessing of reproductive and genetic processes are the basis for the emergent industry of biotechnology, in which the politics of fertility extend from soil to star wars (Hobbelink 1991; Juma 1989; Shiva 1988, 1991; Yoxen 1983, 1986). The "gene gap" has replaced missile envy in the global politics of strategic defense initiatives (Rose 1987, Wheale and McNally 1988).

In all these locations, reproduction is being redefined—socially, economically, politically, and culturally. A simultaneous expansion and diffusion of reproductive politics is occurring across this proliferation of sites and locations: reproductive politics have increasingly become biopolitics in their scope of application and also micropolitics, both in the molecu-

larization of reproductive control and in the Foucauldian sense, denoting a capillary effect of dispersed contestations.

The newspapers are filled with mutant-cyborg headlines proclaiming the latest advances in biotechnological assistance: "Human Proteins Made By Sheep" (*Guardian* [U.K.], 28 February 1989), "Taking a Rise out of 'Mutant' Bread" (*Guardian* [U.K.], 3 March 1990), "First Food Item to be Genetically Engineered Gives Firm Competitive Edge" (*Wall Street Journal*, 27 March 1990), "Scientists Search for Super Plants" and "New Crops for New Weather" (*Guardian* [U.K.], 5 March 1990). Not only the print media but the visual media now use a range of reproductive imagery, facilitated by the various scanning, screening, and other imaging technologies routinely utilized within this field; the hitherto unknown is iconized in television docudramas such as "The World of the Unborn" (see discussion below). Popular film also betrays a fascination with reproductive rearrangements in an emergent genre of mutant-cyborg horror stories (Creed 1987, Kuhn 1990).

Both the constructedness and the artifice of reproduction are also increasingly apparent in such instances, as they are in the applications of new reproductive techniques to humans. The literal piecing together of conception in the laboratory is a definitive signifier of this process. What does it mean for human conception to be assisted? The removal of conception from the dark continent of the woman's body into the transparent petri dish, where it lies immersed in the pure and sterile culture of its cyborg medium-HF- 10 5% bovine serum albumin (BSA), mature follicular fluid (MFF), 5% CO₂ at 37°C-is a bold breach of human genesis. On view afloat in fetal calf serum are our common origins, the baby blastocysts, their unique genetic blueprints and fully human developmental potential encapsulated in all their minute individual glory. No wonder they are called "miracle babies." They embody the "helping hand" of science, which their coming into being makes manifest: they are born of medical assistance. Their assisted (embryo) genesis makes them the first generation of assisted ab-origin-als (*ab origine*, from the beginning). These "new conceptions" have required new ways of making sense of fundamental matters (Franklin 1992a).

The law now regulates reproduction in terms of contract: property, patenting, and criminal sanctions protect human embryos in many countries. Public and legislative debates concerning new forms of assisted reproduction are thus an important source of indications of what is perceived to be at stake in this field (Franklin 1992b, 1993). Given the difficulties of making sense of these dramatic changes, often described in the millennial language of reproductive revolutions and brave new babies, it is not surprising Louise Brown was nearly a teenager before the Human Fertilisation and Embryology Authority in Britain published its first

Code of Practice, governing the origins of her "siblings"-to-be. In the British Parliament, as in similar chambers around the world, assisted reproduction was debated in terms of various risk-benefit equations. On the one hand were the various risks to morality, humanity, and society posed by novel forms of technoscientific intervention into reproduction. On the other hand were the potential benefits these interventions were seen to offer: increased knowledge, relief of suffering, and increased reproductive choice and control.

The argument for benefits is notable for its emphasis upon the inevitability of scientific progress and the indefensibility of standing in its way. The same views are ubiquitous in media representations of the new reproductive technologies with their formulaic narratives of "desperate" infertile couples in search of happiness through technological assistance (Franklin 1990). Together, the authoritative representation of new reproductive technologies as progress by "the great and the good" in Parliament and the more emotive representations of "desperate" infertile couples transformed into happy families in the media provide a buffer against the sense of threat engendered by the image of scientists "playing God" with "the facts of life."

THE NARRATIVE OF ACHIEVED CONCEPTION

The representation of assisted reproduction as natural science in the service of the natural family draws upon recognizable and traditional conventions, and invokes well-established systems of belief such as those concerning the value of the nuclear family and of scientific progress. Less recognizable is the account of conception such representations foreground. Emergent across many different representational and discursive sites are narratives in which conception is not only assisted, it is achieved. Its achievement, in the laboratory by teams of professionals, constitutes an unfamiliar primal scene. This altered version of "the facts of life" is, I argue, all emergent metanarrative of achieved conception derived from the world of assisted reproduction.

An example is a two-part televised docudrama, screened in Britain as part of the Panorama series on BBC 1 in the spring of 1988, entitled "The World of the Unborn" and "The Agony and the Ecstasy" (Genesis Productions). Produced, written, directed, and filmed by an infertility specialist, these films illustrate the components of achieved-conception accounts. The first film deals with "normal" conception—in other words "how babies are made," and the second film deals with the causes and treatment of infertility. Together, these two films depict a continuum between "normal" fertility and infertility in a manner that makes self-evident the need for scientific assistance to human reproduction. They

thus articulate the central principle of achieved-conception narratives, that "nature needs a helping hand."

"Tile World of the Unborn" begins with a birth scene in which the point of view is from inside the woman's body. Muffled noises accompany an image of the vaginal passage from a camera shot in vivo. "The birth of a baby is a miracle" begins the voice-over, as the camera moves outside the body to show the baby being born. Accompanying this announcement are music and an image of "the genes." Tiny "strands of DNA" are shown in black-and-white microscopic enlargements of cellular material. The declaration that "each baby inherits a unique genetic composition from its parents" introduces a series of mini science lessons on early human development, the concept of the genetic code, genetic replication (mitosis), and the reproduction of the sex cells (meiosis). The baby reappears. "In the tiny ovaries of this baby girl, only a few days old, are some two million immature eggs."

Egg development structures the account of female maturation, briefly illustrated by a nude female figure, before the camera moves back inside the body to illustrate the egg's penultimate moments prelaunch. Following the ovum's release into the fallopian tube, a short section describes spermatogenesis (1,000 per second!) before the sex chromosomes are introduced, and there ensues a long shot of the male and female models having intercourse, accompanied by a musical build-up culminating in the man's ejaculation, at which point the camera reenters the woman's body and shows the ejaculate as it "bursts into activity."

"A sperm is essentially a mobile package of chromosomes," the voiceover comments, initiating a requisite account of the sperm's epic quest in pursuit of the egg. "The sperm can swim up to eight millimeters per hour for up to three days." A brief discussion and display of sperm abnormalities introduces the one reference to infertility included in the program before it returns to "the race." "For the millions of normal sperm, this is the beginning of a long journey: the race to reach and fertilize an egg. There can only be one winner. Millions will die in the vagina and at every stage of the journey." To penetrate the cervix, the sperm are described as "form[ing] wedgelike phalanges, driven forward by the ceaseless thrashing of their tails." A brief shot of the egg being released into the tube is shown (again), and the voice-over explains that "Its fate will depend on whether it is fertilized.... Once free, it must be fertilized within twelve hours or it will die." "The entry of the fertilizing sperm triggers the final maturation of the egg," viewers are told.

Fertilization is followed by another gene sequence, demonstrating recombination. "This is the precise moment of conception [creating] a genetic constitution different from any ever before or which will ever exist again." It is also, the viewer learns, a moment of extreme risk: chromo-

some disorders, miscarriage, and ectopic pregnancy dramatically reduce survival rates of zygotes. The rest of the film follows embryonic development before describing the fetal stage, during which growth supersedes development as the "main event." As the pregnancy develops, the midsection of a pregnant woman's body is shown to illustrate the changes in her "profile." The film ends with a return to the muffled interior of the womb and the birth of another baby girl.

"The Agony and the Ecstasy" begins with a very different picture; it depicts those for whom "the flow of life" has abruptly and unexpectedly ceased. The opening scene is of a church wedding. Organ music accompanies the voice-over: "For this couple, as for others on the threshold of a life together, the gift and care of children ... is expected. But there will be some couples who will be unable to have children.... For them, the years will pass in a slow agony as they grieve for the child they cannot have." The scene changes to the office of an infertility counselor, who explains the bewilderment, anxiety, panic, and sense of threat posed by the realization of infertility. Shots of rooftops accompany a brief discussion of the incidence of infertility in the general population before the film turns to its main focus, which is infertile couples' pursuit of treatment through various forms of assisted reproduction. In vitro fertilization (IVF), artificial insemination by donor, and other techniques are explained, as are various diagnostic procedures, over the remainder of the film, which follows several couples through their pursuit of assisted-reproduction procedures. The fortunes of those who have "placed their futures in the hands of the medical profession" constitute the main focus, providing a kind of participant-observer perspective on the world of achieved conception.

The statement by a medical specialist at the beginning of the second film encapsulates the way in which the two docudramas are linked: "To understand infertility," he states, "we need to start with an understanding of normal fertility. *In fact, human fertility is not very efficient*" (emphasis added). This perspective establishes the key cultural construct linking the world of achieved conception to more traditional understandings of "the facts of life," which is that nature needs our help.

MAKING SENSE OF NEW CONCEPTIONS

The emergent narrative described above is also notable in its privileging of genetics. The starting point is the production of gametes rather than conception itself. Whereas older versions of conception tended to emphasize the "journeys" of the gametes, culminating in fertilization, and the subsequent trajectory of fetal growth, the newer versions emphasize the importance of genetic processes of replication, recombination, and ex-

pression. These are seen to be the determinants of the genetic code, which provides the "blueprint" for all the other events. As "natural facts," genetic processes are both hierarchically dominant and sequentially prior to the events of fertilization and conception; they are thus established as both ontologically and teleologically determining, extending beyond the time frame of reproduction in the individual to include both previous and future generations. It is the process of genetic replication itself which constitutes "the flow of life" described in the film. "The facts of life," as they are conventionally understood, comprise a kind of Subsidiary sequence. The emphasis on genetic processes also indexes an increasing emphasis on risk factors: successful reproduction comes to resemble an obstacle course. It is for this reason it needs to be assisted or achieved because it is so prone to error "by itself."

Importantly, the metatrajectory of genetic replication becomes distinguished from the subsidiary sequences of reproduction by the separation of conception from fertilization. Whereas fertilization is often considered to be synonymous with conception in older accounts, the, are defined differently in newer versions such as this television series. According to the first film, fertilization occurs when the sperm penetrates the egg, but conception does not begin until later, when the two sets of chromosomal material recombine. The merging of the gametes, which is what is normally thought of as the "moment" of conception, is thus separated into two parts. First there is the physical merging of the egg and sperm (fertilization), and later there is the genetic merging of the gametes (conception).

Conception is thus defined genetically in these accounts, underscoring again its dominant status as the determining trajectory both narratively and discursively. Gene replication both structures the chronological sequence of the narrative and provides the epistemic foundation of these accounts. The emphasis on the definitive importance of the unique genetic constitution of the embryo, at once distinct from and also continuous with the entire species history, is significant. Here, the center of gravity of conception narratives shifts from the "miracle" of early human development (as enshrined in the famous Nilsson photographs) to the "mystery" of the genetic blueprint that determines this process.

This shift back to the level of the genes and everything that might possibly go wrong with them constitutes one of the most important features of emergent conception narratives. The risks associated with pregnancy are both enhanced and shifted back in time: embryonic ovaries have eggs in them that can be damaged. These new conception stories respond to an increasing awareness of the possibility of reproductive failure, enhancing a climate of "infertility consciousness." Reproductive failure is emphasized not only through accounts of risk but through accounts

of waste. "Nature" is depicted as incomprehensibly profligate. Whereas a female fetus has over two million "unique" egg cells in her ovaries, these are steadily reduced over time. Only a tiny proportion will ever achieve fertilization; an even tinier fraction will implant. Until the advent of recent high-tech monitoring equipment, this degree of "natural wastage" was unrecognized. "A woman would not even have known she was pregnant, the film emphasizes.

A definitive feature of these emergent conception accounts is their linking of fertility with infertility. In them, reproduction appears "naturally" in need of assistance. Understanding the genetic processes of mutation, this logic suggests, can enable medical scientists to prevent or cure genetic "abnormalities" or even to eliminate them altogether from the population. Describing conception itself as an obstacle course also makes sense out of the obstacle-course dimension of IVF; "natural" and assisted reproduction come to appear more similar, both characterized by comparably high failure rates. The two kinds of conception become complementary: if IVF is difficult and largely unsuccessful, it is not surprising since the natural process is so badly designed. Indeed, it is notable that both IVF babies and unassisted babies are described as "miracles" in these films: they are thus conflated. Given how many obstacles stand in the way of successful conception, these films appear to be saying, it is a miracle anyone ever manages to reproduce at all.

The means of representation deployed in "The World of the Unborn" constitute another dimension of what is new about such accounts. Visualizing and imaging technologies are critical to the technical and discursive apparatus of assisted reproduction. The development of a light source to enhance laparoscopic technique, for example, was a critical achievement in the realization of successful IVF. Scanning, screening, laparoscopy, x-rays, and powerful microscopic techniques are essential for both research and clinical technique in reproductive medicine. Hence the importance of feminist understandings of the patriarchal nature of the clinical gaze (Haraway 1989, Jordanova 1989, Petchesky 1987). These visualizing technologies also create the possibility of an elaborate media surface upon which to depict reproductive events. This is a critical interface. The instrumentalism provided by new imaging technologies is epistemic as well as technological. In "The World of the Unborn," for example, several types of representation are intertwined. With few exceptions, such as the shots of the male and female nudes, the viewer's gaze is always technologically enhanced. A sense of bodily permeability is created, as the camera moves seamlessly from the outside to the inside of the woman's body. Technological powers of magnification, illumination, and penetration privilege the viewer's gaze, just as they do the clinicians'.

The spectator position is established through the clinical gaze, using its technologies as the camera moves down the laparoscope.

The technologically assisted nature of the point of view also enables technological simulations of events to enhance "real" imagery. Hence, computer-generated graphics amplify the explanations of genetic processes, filling in the gaps left by the inability of existing medical technology to portray these biological events "in real life." This slippage creates a complex visual-media surface composed of substantially different orders of facts, information, and imagery, thus replicating precisely the ways in which the broader cultural construction of reproduction is changing via technological apparatuses. Computer-generated simulacra assist medical imaging technology in a manner that underscores the technologically dependent character of the entire process. In these multilayered representational sequences, "nature" and its replication merge: simulated nature "bridges the gap" in natural sequences, just as the technologies of assistance are themselves inserted into natural sequences to provide a "bridge to a new life."

The redefinitions of reproduction evident in accounts such as these indicate the extent to which meanings derived from the world of achieved conception are beginning to influence mainstream representations and understandings. As means of representation themselves, they help to legitimate new reproductive technologies, effecting a new common sense about "the facts of life." This change has significant cultural consequences in the wider systems of knowledge and belief to which they make reference.

SHIFTING FOUNDATIONS

With the emergence of these new conception stories, evident in their myriad enunciations in mass media, scientific journals, parliamentary debate, ethical disquisitions, and the like, has come a challenge to certain foundational assumptions upon which previous conception accounts were based. Primary among these is the removal of the conceptive process from the protected realm of naturalness, or at least its reinscription in a version of the natural that is fundamentally altered by the manner in which it is assisted. Whereas "the birds and the bees" described a natural process, inaccessible to human intervention, occurring deep inside the woman's body, and unfolding according to the laws of nature, the new narrative of assisted or achieved conception tells a different story. This world becomes visible and knowable through technological means, creating new forms of accessibility to and improvement of reproduction. The necessity for technological assistance thus comes to be seen as a product

of nature itself. In this slippage, whereby the "helping hand" of technology is both conflated with, and yet also displaces, nature, a key shift in the cultural meaning and organization of reproduction must be seen to lie. The importance of this shift is in its legitimation and naturalization (indeed legitimation *through* naturalization) of assistance to the reproductive process.

A related legitimation of technological assistance, often used in support of genetic engineering, is the idea that nature needs a helping hand because modern technology has already damaged it so much. Thus it is now frequently claimed, for example, that we need biotechnology to help repair the damage done by industrial technologies based on fossil fuels. In each of these versions, there is the idea of cooperation between technology and nature. Yet, such a concept of assisted nature inevitably displaces the natural by the assistance, by definition taking away the very axiomatic status of the natural that makes of it a foundational belief system, an absolute, a certainty, a set of objectively true phenomena. As Strathern has argued: "If nature has not disappeared, then, *its grounding* function has" (1992a; 195, original emphasis). The helping hand of technology becomes foundational through its promise of enablement and its manifest instrumentalism.

However, technology provides a different kind of foundational grounding. Whereas ideas of the natural serve a grounding function by denoting an independent, law-governed, objective, factual "reality," which is in some senses fixed, universal, and absolute, the foundation provided by technological enablement has no such boundaries. The absolute provided by the belief in technological enablement, or scientific progress, lies precisely in the promise of unbounded possibilities. In a sense, the foundational guarantee of technological enablement is the reverse of the Enlightenment hope for science: whereas instrumentalism once promised the means to knowledge, knowledge is now itself displaced by all instrumentalism that makes its own truth. In sum, the loss of the foundational authority of the natural must be seen as both foundational and as antifoundational in its unbounded promise of enablement, which explains much of the anxiety currently surrounding assisted reproduction.

These observations must be qualified. While the possibility of, justification for, and even desirability (for some) of assisted reproduction are new, such a shift became thinkable or "conceivable" much less recently. The idea that female reproductive capacity is badly designed and in need of medical and technological assistance is as old as the use of forceps. The means of technological enablement have gradually moved from one end of pregnancy, parturition, to the other, conception. What is new about the field of technologically assisted reproduction must therefore be situ-

ated in relation to what is not so new-in relation to how such interventions have been legitimated in the past.

Situating new forms of reproductive intervention and control within the historically established trajectory of their "desirability" allows the picture with which most feminists are concerned to emerge. Here, a male-dominated and quintessentially patriarchal system of power and knowledge was deployed to name, define, and control a territory located inside women's bodies. Thus the cultural elaboration of this territory with medical-scientific discourse is cause for much concern. Reproduction is increasingly subject to (and the object of) the hegemonic gaze of the clinician, and his (or, increasingly in the field of assisted reproduction, her) technological apparatus of monitoring, management, and surveillance is perceived as threatening. This view is amplified by the consequent rendering of this territory as a jurisdiction by the (patriarchal) state (Steinberg 1991, Smart 1990, Spallone 1989); a market by the (capitalist-patriarchal) economic system (Shiva 1988); the object of international public debate framed in terms of rights, choice, progress, and other harbingers of the (androcentric) traditions of liberal humanism (*liberté, égalité, fraternité*) (Eisenstein 1989; Pateman 1988, 1989; Petchesky 1984 [1990]); and a media surface on which are deployed a myriad representations amenable to a feminist hermeneutics of how patriarchy inscribes itself upon the template of the natural world.

If the anthropological axiom that what a culture believes about conception serves as a particularly useful analogue for understanding how it defines other things (Malinowski 1929), then the moral of the achieved-conception narrative emergent in contemporary Euro-American culture is, quite simply, "science fathers itself." There is nothing new about this definitive post-Enlightenment Baconian prerogative. After all, it has been the guiding principle through which "nature" has been subjected to "man's" purpose (Easlea 1981, 1983; Keller 1980, 1985; Merchant 1980; Shiva 1988).

Postmodernism describes the process whereby certain foundational distinctions or boundaries are breached, leading to a crisis of legitimacy: this process is occurring, for example, in traditional beliefs about parenthood, procreation, and kinship. This area has not been very much explored within postmodern theory (with the notable exception of Haraway 1989, 1991). Beliefs about procreation are themselves foundational to a range of cultural definitions concerning parenthood and kinship, gender and sexual difference, inheritance and descent. To modify the processes of reproduction or genetic inheritance is to make unprecedented interventions into human reproductive futures and thus, inevitably, into key definitions of humanity itself. Through reproductive assistance, for example, procreation is separated not only from sexuality but from the

body, and fertilization is achieved technologically. An expansion of parenthood is thus effected, as the "miracle" baby's coming into being derives from a number of contributions from parties previously uninvolved in the conception of new persons. Hence, the state has a "parental" interest in the origins of all new individuals born through the use of assisted-reproductive techniques; the clinic becomes the site of procreative acts, and the clinicians the actors in the achievement of conception. The important symbolic conjunction of conjugal and procreative activity and the equally important opposition between acts undertaken for love and those undertaken for money are breached. What was once a private act of love, intimacy, and secrecy is now a public act, a commercial transaction, and a professionally managed procedure. In the context of assisted reproduction, successful conception and procreation have become achievements, realized through teamwork and the helping hand of technology.

RELATIVE UNFAMILIARITY

A child is seen to be a natural product of the procreative act of its parents. In Euro-American kin constructs, the child embodies equal contributions from its parents, to whom it is genetically related. This is a "blood relation." As Schneider (1980) has argued, the kinship system is constructed through relations of blood (shared bodily substance) and relations of law (marriage). Assistance introduces a new order of facts that destabilize this foundation: these are the natural facts produced by technology.

Thus, embryos acquire a high profile in legal disputes, medical literature, and media coverage. Embryos have become public entities, been granted a degree of legal protection, and become the subject of endless public debate. This process can be seen as a new kind of kinship debate, in which various categorical and classificatory border zones are currently being disputed. The embryo emerges as a kind of liminal kinship entity (Franklin 1993). According to existing kinship definitions, the embryo fulfills all the necessary criteria of kin relatedness. It is a blood relation in that it has genetic links to its parents. It may be considered legitimate or illegitimate according to the circumstances of its conception. It can also be seen as a kinship entity because of a more symbolic relatedness: it is what we all once were, and in this sense it can stand for common ancestry. This is seen as a universal fact of all humanity, that we share the same beginnings, as tiny embryos created by the process of fertilization. The embryo is human, it is an entity, and, it is argued, it is a unique individual, containing in itself the potential to become "one of us." For all these reasons, the embryo can be seen as possessing a kind of kinship status not only to specific persons but to humanity in general.

The liminal kinship tie to embryos can be compared with that which

we are seen to possess to "our nearest living relatives," such as chimpanzees, with whom we "share" over 98 percent of our DNA. Their kinship to us is based on both resemblance and genetic ties (constructed through evolution, the long version of human ancestry and inheritance and thus of kinship). It might be described as a species kinship (Haraway 1994). The embryo is not unlike a different species of human in the sense that while it fulfills several criteria of relatedness, it also differs markedly from "us" in being a microscopic entity, unrecognizable in any immediate way as a person or even as a human being.

The embryo is also a cyborg entity; its coming into being is both organic and technological. Though it is fully human (for what else can it be?), it is born of science, inhabits the timeless ice land of liquid-nitrogen storage tanks, and feeds on special (pure) culture in its petri dish. At once potential research material (scientific object), quasi-citizen (it has legal rights), and potential person (human subject), the embryo has a cyborg liminality in its contested location between science and nature.

The liminality of the embryo, betwixt and between humanity and otherness, potentially but not yet recognizably one of us, is what makes of embryo research such a busy and impassioned field of contestation. These contestations provide a template of cultural definitions of what it is to be a person and of what makes a kinship tie: they are late-twentieth-century debates over the meanings of naturalness and humanness. The arguments are by now familiar. Those in favor of embryo research argue it will bring great benefit: cures for disease and relief of human suffering. They argue that at the earliest stages of life the embryo is not a person. Against this position, those opposed to embryo research argue that it constitutes a breach of humanity, a form of immoral interference. This case can be argued on religious, scientific, or moral grounds. The feminist argument, which critiques both embryo research and the ubiquitous polarization of debate in line with the positions described above, is that an embryo can only develop inside a woman's body. An embryo outside the body can only be created by interfering with a woman's body and therefore cannot be called an individual or given civil rights without creating a conflict of interest between two persons over one body—a conundrum that confounds the entire basis of liberal democratic freedoms grounded in notions of individual integrity and autonomy.

In the British Human Fertilisation and Embryology Act, parliamentary approval for embryo research was based on a balance between its perceived necessity and its strict regulation. The Act follows the logic of the primitive-streak argument, which, it is said, "will be taken to have appeared at 14 days"; within this "natural fact" a distinction between permissible and impermissible research was found. Like the "natural facts" in paternity disputes, which are based on blood tests or genetic finger-

printing, the primitive-streak argument both appeals to the authority of nature and renders it redundant. The natural facts alone, in this case, are insufficient to provide a clear boundary, so a specified time period is substituted for them. In the wake of the technological "achievement" of in vitro embryos that supersede natural facts, there is a legal solution that also supersedes them. The legal fact of fourteen days and the technological fact of the embryo's existence outside the body thus displace the once foundational authority of natural facts as the basis of regulation concerning kinship and parenting, which are now extended into the realms of human fertilization and embryology.

From a postmodern point of view, the loss suffered in conflating natural and technological facts need not mean the demise of the natural as a symbolic domain or the loss of its authority entirely. What postmodernism describes is a loss of faith, a crisis of legitimacy, and a collapse of foundational authority. It is a particular construction of nature that is shifting, one that arguably provided a certain degree of reassurance as a source of absolute truth. In the confusion encountered within the law around these contested natural facts is evident a loss of faith in nature as a referent system. It is to this particular loss, not the failure of beliefs about the natural more generally (which appear happily to mutate indiscriminately), that a postmodern character might be ascribed.

CONCLUSION

The redefinition of reproduction currently occurring in the context of assisted reproduction needs to be appreciated in its specifically cultural dimensions. These have been explored here using evidence from a number of different sites and locations, including popular media representations, public debate, and parliamentary proceedings. A number of cultural shifts can be seen to be taking place. Primary among these are transformations of the meaning of "natural facts," which I described as having lost a certain degree of authority. In place of the order of nature it has been argued that technology has become foundational. Yet this foundation is slippery or even itself antifoundational in its promise of unbounded possibility. Postmodernism is used as an analytical framework for examining this process because it provides a means of making visible the extent and nature of the cultural transformations resulting from assisted reproduction. These effects have been traced through what is conventionally recognized within anthropology as a key site in the production of beliefs about kinship, personhood, and human origins: the process of coming-into-being, or conception.

These indicators point to a particular global lens, that of international

scientific collaboration in the fields of human reproduction and genetics, as a critical focal point of cultural production. Such a view amplifies the feminist concern not only to protect "women's interests," but to foreground the need to establish boundaries around the technological enablement provided by assisted reproduction. A cultural analysis explains, in part, why it is so difficult to assess implications 'In a field of such unbounded scope. It also confirms the importance to feminism of specifically cultural frameworks through which the contestation of reproduction in the form of representations, imagery, meanings, and symbols can be adequately gauged. If the expansion and dispersal of reproductive politics into biopolitics and micropolitics make the task of critical feminist assessments more complicated, the importance of such assessments also becomes more obvious, as issues of longstanding feminist concern emerge at the center of an area of widespread public anxiety. For feminism, in which biology has long been recognized as a highly political field, the emergence of biopolitics on the global scene represents an expansion of familiar territory, and a confirmation of early feminist redefinitions of the political to include the natural, the biological, and the genetic. It would be a pleasurable ironic tribute to years of feminist protest against the tyranny of natural facts in the definition of "woman's place" to watch nature implode into culture if it were not for the black hole of unbounded technological assistance, which has replaced that weary opposition. But, then, our location as reproducers of the very cultures we seek to challenge has never been other than paradoxical.

NOTES

It was a pleasure and a privilege to attend the Wenner-Gren symposium on the Politics of Reproduction, for which this chapter was originally written. My very sincere thanks go to Rayna Rapp and Faye Ginsburg for organizing so successful a conference, and to Sydel Silverman and the staff of the Wenner-Gren Foundation for their characteristically admirable efficiency, hospitality, and guidance. Rayna Rapp lent a deft editorial hand to the production of the final version, for which I am most grateful. Thanks for inspiration and assistance are also owed to the conference participants, and to Marilyn Strathern and Donna Haraway, whose work continues to be integral to my thinking and writing on kinship, culture, and the biosciences.

1. The so-called "primitive streak" is the early spinal column of the embryo, visible at approximately fourteen days. Its emergence is understood to mark the differentiation of human tissue from tissue which will become the placenta within the early embryo. The British government, in its Human Fertilisation and Embryology Act of 1990, used the emergence of the primitive streak as the biological and juridical marker after which the embryo cannot be experimented upon. It is also the proposed cut-off point for permissible (i.e. fundable) research on embryos in the United States according to guidelines now being developed for the National Institutes of Health.

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