

From Technobirth to Cyborg Babies Reflections on the Emergent Discourse of a Holistic Anthropologist

by Robbie Davis-Floyd (with contributions from Joe Dumit, whose editorial comments, together with my responses, appear in italics throughout)

Chapter 13 in Cyborg Babies: From Techno-Sex to Techno-Tots,

edited by Robbie Davis-Floyd and Joseph Dumit. New York: Routledge 1998:255-284.

Cyborg imagery can help express two crucial arguments...first, the production of universal, totalizing theory is a major mistake that misses most of reality, probably always, but certainly now; and second, taking responsibility for the social relations of science and technology means refusing an anti-science metaphysics, a demonology of technology, and so means embracing the skillful task of reconstructing the boundaries of daily life, in partial connection with others, in communication with all of our parts...Cyborg imagery can suggest a way out of the maze of dualisms in which we have explained our bodies and our tools to ourselves...Though both are bound in the spiral dance, I would rather be a cyborg than a goddess.

--Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist Feminism in the Late Twentieth Century," 1991:181.

For the past fourteen years, I have been researching women's experiences of pregnancy and childbirth in American society. The results of that research have appeared in a number of publications. Here I indulge in a more autobiographical and reflexive approach, to ponder my fairly recent anthropological engagement with the problematics of cyborgs and cybertalk. It is not a discourse I would have gravitated to on my own, but rather one I felt I had to open myself to as a direct result of my research on pregnancy and childbirth among white middle-class American women--including myself. Let me explain.

A Cyborg Birth

My first child was born in 1979. A twenty-six-hour labor that started out in the hospital's alternative birth center ended in Cesarean section.

As I lay on the operating table, numb from my chest to my toes, I received graphic confirmation of the "reality" of Cartesian mind-body dualism--for the first time in my life, I existed only as a disembodied head. Entering the hospital (at least in my own mind) as Earth Mother, I had in just over one day become Cyborg--my body and my experience of that body had been irrevocably altered by the pitocin that made the contractions too painful to bear, by the Demerol that made me woozy and unable to cope, by the institutional policy that would not let me eat even though I was starving, by the long steel hook that broke my waters and made it essential that the birth happen within a certain amount of time, by the deadly cold metal table on which I now lay, by the epidural anesthesia that cut me off from all sensation below my upper chest, and by the green curtain that cut me off from even visual contact with my huge belly and my emerging child.

I wish I had known about cyborgs then, because that concept has such power. Cyborgs can be interpreted as not diminished, but enhanced beings; they are often not less than, but rather more than human. In those painful, terrifying, and most of all confusing moments of disembodiment, when I felt shrunken, helpless, and overwhelmed, I could have used the sense of transcendence that might have accompanied my cyborgification. I am certain that the terror, the confusion, the feeling of spinning out of control, out of contact, out of my body and into the narrow parameters of my mind would have been greatly mitigated if my cesarean could have been accompanied by the beneficial mediation of a cyborg consciousness. Instead of suffering a devastating sense of disempowerment, I could have--since I was suddenly forced to live in my head anyway--become fascinated by the intellectual conundrum of being a body one minute and only a head the next. I could have pondered the coevolution of human and machine that started in Europe in the 1700s and led to this moment--or did it really start hundreds of thousands, perhaps even millions of years ago, the first time a hominid female sharpened a digging stick? Was it the first hunter's spear that was piercing my belly now? Was this (as I discovered later) totally unnecessary high-technology operation the uncomplicated result of an interventive obstetrics (pressured to be even more so by an equally interventive legal system) with roots only in our own historical period, or was it the inevitable result of an inexorable evolutionary process that was dragging me, kicking and screaming (without moving or speaking) into the cyborg future of humankind?

I could have been captivated by the intellectual challenge of trying to deconstruct my cyborgification and its results, which seem to me now to constitute a scattering, a diffusion, a parceling out of the birthing functions that in other circumstances I myself would have had to perform--or die trying. There was an anesthesiologist at my head controlling the sensations that I didn't feel and an obstetrician at my belly incising through five layers of flesh to reach into the deep and intensely private recesses of my womb and pull out with his hands the baby that otherwise my own muscles, grit, and will would have had to push down the birth canal and into the warmth of my waiting arms. Several nurses assisted him, doling out the tools of my dissection, graphically described as follows in my medical chart:

A transverse skin incision was made sharply with a knife and carried down through the subcutaneous layers until the fascia was reached. The fascia was sharply incised with the knife and the incision carried laterally. The rectus muscles were separated in the middle and retracted. The parietal peritoneum was grasped with clamps and incised, exposing the abdominal cavity. The visceral peritoneum overlying the lower uterine segment was then grasped, incised, and dissected sharply and bluntly creating a bladder flap over the lower uterine segment. The lower uterine segment was then incised sharply with a knife and the incision extended bluntly. The infant was delivered from the cephalic position as pressure was exerted on the uterine fundus. The infant was briefly placed on the mother's upper chest and then handed to the father to be taken to the nursery for further care. The placenta was manually extracted and appeared intact. The uterus was then externalized from the abdominal cavity and explored for any remaining placental fragments. The uterus was then replaced in the abdominal cavity and the defect was repaired in a single layer closure....

My husband stood and watched, the visual prosthesis for my gaze, which was cut off by the ugly green curtain. So many people to do the work of one! A cyborgian system, consisting of people, information, institution, and artifacts, all there to "externalize" one baby from one mother--who if they had but been left alone, could perfectly well have accomplished this miracle on their own. But no one in that room knew that for sure; everyone, at the time, thought that this procedure was necessary, perhaps even lifesaving.

Had it been so, there would have been a glory in this symbiosis, this refusal of the human spirit to give in to the perversity of Mother

Nature, who occasionally seems just as willing to let a baby die as help it be born. She doesn't care--it's all the same to her--life dies, returns to her bosom, refertilizes her soil, and is born again. What is one baby's death to Gaia, who sees only the ever-recycling, ever renewing, ever-interlinked whole? But humans care. These doctors, the obstetrician and the anesthesiologist--the dual agents of my cyborgification--were trying to take control of a natural process they perceived as having gone awry, to make sure that the end result was a live and healthy baby.¹ Certainly they did not perceive themselves as victimizing, or in any way disempowering me, or as engaging in the mutilation and prosthesis (see Introduction) of the natural process of birth. What I felt about what they did was in no way part of their experience of doing it.²

Years later, when I read Donna Haraway's "Cyborg Manifesto," I was utterly fascinated by the optimism that characterizes her portrayal of the cyborg universe. But when my daughter was delivered by cesarean in 1979, this manifesto had not yet been written, and so instead of the transcendent fascination that could have been mixed with the pain, what I felt while I was being "sectioned" was a profound alienation from my body and from the experience of birth, a deep loneliness, and an overwhelming sense of helplessness and victimization (from which I did not fully recover until, four years later, I gave birth to my second child at home). When, as the report describes, my baby was laid briefly on my chest, I was barely able to move my arms to hold her. But my experience of bonding with her was nevertheless remarkable--I felt instantly as I gazed at her that we knew each other, that we were still one, despite the obvious fact that we were now quite separate and discrete. It is a sense of oneness that no physical separation has ever threatened or reduced. Later, when I learned the language of holism, I was able to use its words to explain that our energy fields, merged during her gestation in my womb, stayed connected even after our physical separation. But at the time I did not need the language of holism to have the experience of being wholly one with my newborn child, as I would have needed the language of the cyborg to sense a transcendence in my body's technocratization. Interesting it is to me now that this first birth experience so richly encompassed both dimensions--the technocratic and the holistic--that would eventually constitute focal points for my professional research.

Joe to Robbie: Wait a minute. Cyborgs embrace the organic and the non-organic. But you seem to think that cyborgs aren't holistic. Can you situate the notion of holism that you draw on here (where holism is precisely not cyborg but fully organic, and

only natural)? To me that is a specific ethno-holism if you will. Perhaps I show my suburban-computerized roots here, but when I hear "holism" I imagine a world that includes technology, filled with all sorts of techniques and instruments.

I'm reminding myself of two brothers. One of them, David Jay Brown, is fascinated with brain-entrainment machines and thinks that they are the way to get in touch with our potentials. He thinks they can be individually attuned to individuals and therefore are more natural and pure than drugs for altering consciousness (i.e. the brain machines are products of consciousness that help further it). His brother believes the exact opposite, that the machines are wrong because they are inorganic and mechanistic, not of the earth, whereas mushrooms are organic and natural and therefore the proper way to fulfill our potential.

Robbie to Joe: Certainly the holistic physicians I have interviewed for the next book I am writing-- on the paradigm shift from technomedicine to holistic healing--would agree with you. They use lots of technologies--e.g., biofeedback machines, diagnostic computers--that they see as an integral part of holistic practice. What I mean by "holism" here is a specific paradigm of healing that sees the body as an energy field in constant interaction with all other energy fields and that stresses the value of an integrative approach to healing the whole person in the context of their lives and relationships. What I mean by "technocratization" is a specific paradigm that I call the technocratic model of medicine, which defines the body as a machine. From that basic definitional principle stems a particular, highly interventive approach to childbirth, one which insists that, like a machine in a factory, the laboring body should produce its product within a specified amount of time; and if not, this birthing machine is obviously dysfunctional and in need of intervention and repair. That my body might have its own rhythms and pace of labor, that my emotional response to the frightening and cold hospital environment might impede my progress, that what I really needed was plenty of time, food, and love--these things, which are intrinsic to a holistic approach to birth, have no relevance under the technocratic model. I don't know if cyborgs can be holistic. I do know that there was nothing holistic, and everything cyborg, about my cesarean birth.

One year later, after reading numerous books and talking to countless people about the bizarre and hurtful nature of my birth experience, I came to the conclusion that the cesarean had been medically unnecessary--the result of hospital procedures and schedules that did not allow my labor to proceed on its own time. (Indeed, four years later my home birth labor lasted three full days. The normality of long labors for many women is unrecognized in most hospitals; had I not been at home for the second birth, I would have had a Cesarean again.) My outrage was intense. All I could see was that I had been brainwashed and mutilated by a dysfunctional medical system. So it is hardly surprising that the first eight or so interviews I conducted a few months later when I began my dissertation research were full of leading questions like "Didn't you hate it when they hooked you up to the electronic monitor?" "Having to lie in that hospital bed was awful, wasn't it?" I was angry about my hospital birth, and I wanted, expected, and believed that my interviewees would be too. But after I transcribed that first set of entirely unprofessional interviews, I realized with dawning shock that what the women were telling me was not at all what I wanted to hear. I wanted them to refuse anesthesia and have natural childbirth, or at least to be upset if they couldn't. But what they wanted was an epidural as soon as the contractions got intense, and were upset if they didn't get that pain relief. While some of the 100 women I eventually interviewed shared my attitude, the majority--70%-did not (see Davis-Floyd 1992:187-240).

Technobirth and Technocracy

Once I realized that contemporary obstetrics is a system that is co-created by obstetricians and women, each of whom have much to gain from deconstructing organic childbirth and re-constructing it as technological production, I was forced to look again at the human-machine interaction that characterizes this reconstructed technobirth--at the strong symbiosis between the woman and the technology; at the way in which it removes the chaos and fear from women's perceptions of birth and at its perfect expression of certain fundamentals of technocratic life (Davis-Floyd 1994b). The IV, for example, is the umbilical cord to the hospital, mirroring in microcosm the fact that we are all umbilically linked to the technocracy, dependent on society and its institutions for our nurturance and our life. The episiotomy, in which the inchoate, fluid, malleable, and quite sufficiently stretchy perineum is routinely cut with scissors to speed up delivery of the head, enacts and displays not only our cultural tendency toward impatience but also our extreme commitment to the straight line as a basic organizing principle of cultural life (Davis-Floyd

1992). The fact that the baby's image on the ultrasound screen is often more real to the mother than its movement inside her (see Mitchell and Georges, this volume) reflects our cultural fixation on experience one-step-removed on TV and computer screens. The electronic fetal monitor (see Cartwright, this volume) wires the woman into the hospital's computer system, bringing birth into the Information Age. The plastic bassinet in which the newborn is placed metamorphoses into the crib, the playpen, the plastic carrier, and the babysitter-as-television set--and a baby who bonds strongly to technology as she learns that comfort and entertainment come primarily from technological artifacts. That baby grows up to be the consummate consumer, and thus the technocracy perpetuates itself.

Over time I began to perceive the mutilation and prosthesis of technobirth as the fullest metaphoric expression of life in the technocracy, which I define as a society whose central organizing mythology constellates around a technological progress that will culminate in transcendence of all natural bounds, including both biological and planetary limitations (Davis-Floyd 1994b). The cyborg represents, even embodies, our increasing closeness to that goal, and so takes on a mythological significance that is extreme.

There is so much that is positive in this myth of cyborgian transcendence. Without the kind of human-machine symbiosis so graphically achieved and perpetuated in hospital birth, Stephen Hawkings would be completely incapacitated instead of a vital member of the astrophysical community, and my brother-in-law would be still be in agony from the disc that ruptured in his back. The metal plate that replaced it and the steel bars that support his spine and set off airport security alarms cyborgify him as surely as my total engagement with and dependence on the computer that I am writing this on, the ergonomic chair on which I sit, the special glasses I have to wear to be able to focus on the screen, and my total dependence on the car I drove to get to this office, make me a semi-cyborg too. (And then there was the night back in 1986 when, after months of intensive work on my dissertation, I had the bizarre and inexplicable experience that for a brief period, my consciousness and the cursor became interlinked, and the cursor seemed to go wherever I willed it to!) I cannot disagree with those who suggest that "cyborg" may be a richer conception of the proper object of anthropology than "human being" in the biological sense. We are (almost) all cyborgs now.

Except of course for David Underwood (a pseudonym), who lives outside of Palestine, Texas with his wife and eight children, all home-

birthed and home-schooled and home-fed from the organic garden in the back, who select-cuts timber for a living and drags the trees out with horses to avoid the rape of the forest that would come from cutting a road. And except for Sandra Morningstar, an independent midwife from Missouri, who believes that inserting an IV should not be a required entry-level skill for homebirth midwives, because requiring that skill might send a message to new midwives that it's OK to skip the shepherd's purse--the low-tech herbal remedy for postpartum hemorrhage--and start with the high-tech IV and the pitocin. This interventive approach for her would represent a distortion and a violation of the essence of the kind of holistic midwifery she fights so hard to preserve. And except for Jeannine Parvati Baker, the shamanic midwife who, when the obstetrician ordered her to lie down, left the hospital against medical advice to give birth to her twins at home. In fact, she birthed all six of her children at home, the last three in the water, and she advocates and has written widely about conscious conception, psychic communication with the unborn child, and the deep ecology of what she calls "freebirth" (Parvati-Baker 1978-1992). There are those in this society who actively and articulately resist cyborgification, who honor biology and give it primacy over technology, and who would vastly prefer to focus our efforts to transcend biological limitations on honing our intuition and our psychic abilities through meditation, organic food, and vision quests in the wilderness.

A Non-Cyborg Birth?

Years of involvement with the alternative birth community these midwives represent have made my own relationship to the cyborgian myth a suspicious one. Early on in my dissertation research, I was invited to give talks and workshops at childbirth education conferences. While the childbirth educators who came to my talks were fascinated with my anthropological interpretation of obstetrical routines as rituals that enact the core values of American technocratic society (Davis-Floyd 1992), the intellectual stimulation of my argument was not enough for them. They wanted to know what they could do about it. They took it for granted that birth was healthy and organic, not pathological and mechanistic, that women were better off without drugs and monitors, that the bonding period was critical, that natural childbirth was best.³ Their holistic attitude influenced me greatly, and helped me find the courage to give birth to my second child--a ten-pound baby boy--at home twelve years ago. That experience cemented my own transition to a holistic approach to life and to health, including pregnancy and birth. This holistic paradigm

(Davis-Floyd 1995; Davis-Floyd and St. John 1998) suggests not only that the body is an energy field in constant interaction with other energy fields, but also that healing requires attention to the body, mind, spirit, community, and environment, that the pregnant woman and child are inseparably one, that too many technological interventions make birth dysfunctional and themselves cause the problems they are designed to solve, and that women give birth best when they are nurtured and protected so that their bodies can set the tone and the rhythm of birth, with no one else's rhythms or timetable superimposed:

Home Birth, Day Three

A contraction awoke me at dawn. I felt tremendously refreshed and extremely grateful for such a wonderful sleep. The contractions were still coming every ten minutes, so I ate a good breakfast and got back into the hot tub. Soon the contractions picked up in intensity. By noon they were coming three minutes apart, and I was in serious distress. By midafternoon I was arching my back in the tub during contractions, pulling on Robert's arms and pushing against the side of the tub with my feet. It was the only way I could stand the pain without going nuts.... In desperation I looked at my friend Rima. She began chanting in a very soothing and beautiful tone. My midwives, my husband, and my daughter picked up the chant. They encircled the hot tub, holding hands and chanting, and I chanted my pain and my joy in giving birth, and the room sounded and resounded like a Catholic cathedral.

After an hour or so more, I had to get out of the tub to go to the bathroom. When I finished, I noticed that the bed had been freshly made up with my favorite sheets and quilt to receive my newborn and me. It looked so inviting! I dived onto it in the middle of a contraction, and suddenly everything changed. Without any pre-plan, I simply gave up and surrendered to the overwhelming force of the contractions. Until that moment, I had been struggling to maintain myself as separate from the pain, to back away from it somehow, or at least to do something about it--to chant with it, dance with it, breathe with it--anything but let it be. Suddenly I just let that effort go. I completely gave up, and I said to the pain, "Take me, I'm yours." Then a miracle happened. I felt that I, body and soul, became the pain, and once there was no more separation between me and the pain, there was no more pain! I lay there on the bed, utterly relaxed, breathing softly, in total peace. I could hear the midwives whispering "Good, that's really good." And that was, for me, one of the most important life-lessons of this birth--the value of yielding, of complete surrender. As Elizabeth

Noble puts it, "Resistance to the pain is the pain." As long as I struggled for separation from the pain, I got more pain. When I gave up the struggle and surrendered to the pain, there was no more pain.

I could only maintain that altered state as long as no one divided my attention, so I lost it when my waters broke and people started to speak to me. But now I was high on the transcendence I had just experienced, and excited because the birth was so near. Returning to the hot tub, I tried some tentative pushes, but I didn't put my heart and soul into it because the pushing hurt more than the contractions alone, and I was disappointed because I had hoped it would hurt less. After about twenty minutes of pushing, the midwife asked me to get out of the tub and push on the toilet--something about the baby being "stuck on the Ischeal spines." As I ran down the hall to the bathroom, the second most important lesson of the birth happened to me. The walls of the hall, and all the other people running down it with me, suddenly fell away, and I was completely alone in a universe of my own making. And I got it that this time there would be no rescue. There was no white knight with an epidural to rescue me from the dragon of pain. No one and no thing could do this for me. It was totally and completely up to me. And I had set it all up so that it would come to this existential moment of realization that I had to do this thing. All of my life, things had come easy for me. This was hard! But the only way out of it was through it, and I had to do it.

And then I was, finally and for the first time, truly ready to give birth. My commitment at long last was complete. I shivered with the realization that this was it! Now, here, me in this place, feeling this pain--no, doing this pain. I was actively doing the pain to myself now--no more avoidance. I put my heart and soul, and every muscle in my body, into pushing the baby past the "stuck place." The pain was unbelievable! but it was tempered by my new-found determination. I was going to do this thing, no matter how much it hurt. There was tremendous relief in that commitment.

There was also relief in my subsequent discovery, at long last, of how to push. I had been straining the wrong muscles, and I finally figured out that if I bore down from my diaphragm, I could actually gauge the proper angle to push from and into. After that, my pushes became much more effective. I can still feel that sensation in my diaphragm of the discovery of a powerful muscle that I had never consciously utilized like that before.

It's strange--even though my official plan had been to give birth in the water, I knew from the beginning that I was not actually going to do that. I knew that I needed the water for labor, but my bed has always been my "safe place." When I got up from the toilet, I instinctively headed for the bed. Robert got on it first, with his back to the wall, and I got between his legs, semi-upright, leaning back against him. I found out later that it took me, then, about fifty minutes to push out my baby. Here, as best I can tell you, is what that was like.

Pain. Grinding, blinding, absorbing intensity. Only pain, and pushing into the pain. Only pain, and pushing. I have been pushing for an eternity now. There is no thought nor even hope that this will be the last push-- it's just itself, a swimmer's stroke. In the midst of my absorption, I see the lesson, another life lesson from this birth. I get it! When you're in the middle of the English channel, you can't afford to think about how far away from shore you are. If you do, the next thing you will think is, "This is impossible. I will never be able to swim that far." That's why the champion marathon swimmers don't count the distance. They enter a timeless dimension, where this stroke is all there is. This stroke, and this one, and then this one. I am in that timeless world. I quit wondering eons ago when the baby will come out. There is only this contraction, and this push, and this pause, and then this contraction, and this push, and--

Then the midwife's Voice, summoning forth my consciousness from its burial in the depths of sensation. I emerge, suddenly aware that I am here, that there still is a Me that can be called forth from this primordial absorption. The voice says "Look! Look in the mirror." Dazed, I lift my head, straining to see over the mound of my belly. What I see shocks me into full awareness. Blonde, white blonde hair, starkly and miraculously framed by the curly dark locks on the sides of my distending vagina. I am stunned. There is not only this pain, this grinding, bone-crunching agony of raw sensation. There is another! A baby! A not-me. My hair is dark. But in the mirror, I see blonde hair framed in my vagina. Oh yes, that is what I am doing. I am giving birth to a baby. There is a baby. I am birthing it. My pushes are working! My pain is for something! I draw a breath of wonder, and push again, and watch transfixed as the oval of hair grows larger. It's working! I am working. I am doing this; it is me, this is Me, doing this, giving birth.

I fall back, exhausted, and rest until the next contraction seizes me in its bony grip, and I galvanize every fiber in my body and PUSH. I know what I am doing now, and why. For a while there, lost in the pain-haze, I had forgotten.

A sudden sharp burn intrudes on the deeper pain that I have almost gotten used to, and, taken completely by surprise, I cry out. (My four-year-old daughter Peyton, gazing raptly from her bird's eye view on a high stool at the foot of the bed, throws her hands over her ears for an instant, then takes them off again, relieved to see that I am back to my guttural grunts and moans.) And then the Voice says, "Reach down. Reach your hand down." And I reach down--what am I reaching for? What am I? And my hand encounters a head--warm, wet, enormous. I will never forget that sensation--it is imprinted in my hand's palm and my heart's memories. And I rest between contractions, glorying in the miracle of two-in-oneness, cradling my baby's head in my hand.

I am in joy and at peace, but the midwives are concerned. Something about shoulder dystocia. When are they going to get off it, I wonder. I know that all is well. But I can sense their anxiety, and I understand, so I willingly forsake my peace and push for them, not waiting for the next contraction. If I don't get the baby out fast, they will turn me over on my hands and knees, and I can feel my body rebel against the thought of any change in position. So I galvanize again--a deep breath, an internal focus on that muscle in my diaphragm, a precise gauging of the angle of pressure, the total participation of every cell in my body, and....

I have tried, but I cannot describe the overwhelming relief and release I experienced when the baby suddenly flew out--on film all we have of that instant is his body's blur. I sank back into Robert's arms, carrying with me the impression of my newborn lying on the bed, asleep! no less, after all that--so peaceful. Just as I had known my daughter, I knew him. I knew he was okay--just taking his own time to come to terms with this sudden change in dimensions. (Excerpted from Davis-Floyd 1998)

Midwives, Cyborgs, and Me

As my personal and professional development progressed, I began receiving invitations to speak to small groups and large conferences of

birth practitioners, including nurses, midwives, and sometimes obstetricians. It was the independent midwifery conferences where I felt the most at home--the holistic, nurturant approach of midwives to birth was very much in alignment with my own. I soon became fascinated with midwives' willingness to listen to intuition--that still, small, and culturally devalued inner voice--as a primary source of authoritative knowledge during birth (Jordan 1993; Davis-Floyd and Davis 1996). During extensive interviews, I heard many stories about the times midwives had relied on intuition, even if it contradicted their own standards and protocols. I was amazed and humbled by their courage and their respect for that kind of embodied knowledge. "Where does it come from?" I asked them. "It's in my heart, my gut, my hands," they answered me. "It's a cone of power that flows through my body." These midwives themselves are potential cyborgs-in-the-making: from their cellular phones to their oxygen tanks to their websites and e-mail networks, they dance ever-more-fluidly on the edge of the human-machine interface. Erase those lingering mental images of the hand satchels and saddlebags of yesteryear--today's midwives carry a minivan-full of equipment to their clients' homes.⁴ They respect and learn to utilize technology, but they do not grant it center stage. They use it only when they believe that it will truly be of service to the mother and her child, and they insist that the essence of their practice is their intuitive connection with the laboring woman. One of them even went so far as to say that:

Assisting women at birth--that's all it is, is intuition. I listen to the baby's heartbeat, because, you know, I listen to the baby's heartbeat, but I don't really care about it, because I have this inner knowing that everything's fine.

Q. Do you also know when everything isn't fine?

Sure you know, there's an energy there.

Q. Has there ever been a time when the stethoscope told you one thing but your intuition another?

No. If I detect a problem with the baby's heartbeat, there have already been signs that I'm suspecting there may be a problem. The heartbeat almost never tells me anything...[I document it] for the lawyers. (Jeannette Breen, quoted in Davis-Floyd and Davis 1996:248)

In recent publications (1992-1998), I have contrasted this holistic attitude with the insistent technocratic reliance of hospital-based practitioners on information externally obtained from tools and machines that can only be handled by technical experts who hold a monopoly on authoritative knowledge. I have written extensively about the differences between these technocratic and holistic approaches to birth. And I have found the mediation of these conceptual oppositions in the midwives who serve women across the full spectrum that ranges between these two oppositional poles, bringing elements of each into the other--technological diagnosis and remediation into home birth, nurturance and home-cooked food into the hospital--in the manner of yin and yang.

The first time I read the "Cyborg Manifesto," however, I realized with shock that Haraway was talking about an entirely new paradigm--one that went way beyond the dichotomies I was analyzing, full of as much organicity as technology, as much tenderness as machinery, as much hope as skepticism. It was a new way of thinking about the human-machine interface and I found it both chilling and fascinating. I sat in the audience listening to the presenters on the first cyborg panels at the annual meetings of the American Anthropological Association in 1992 and got hooked. Here was the positive side of the technological transformations sweeping hospital birth--a way to see them as part of human-machine co-evolution's newest phase: the information society. I got into it. In some ways, it was an "if you can't beat em, join em" kind of thing (I'm too much of an optimist not to seize hope, even if it looks like a Transformer!). In other ways, cyborg anthropology was offering me a productive means of coming to terms with the hegemonic real-time realities of technology-assisted reproduction and technobirth. I found the complexities of the cyborg to more accurately, more hopefully, and more thoroughly represent the complexities of the technologization of reproduction than the reductionistic holistic-technocratic dichotomies with which I had been working. My increasing engagement with this new field--a process that leaves me both stimulated and concerned--is culminating now in the co-creation of this book. And for that engagement I have taken some flack from those who, like me, are horrified at the over-technologization of birth as of life. While I honor their perspective--it is also mine!--I can only say that I can find no refuge in a blanket rejection of the cyborg and all s/he represents. How indeed could I honestly reject what I am?

Joe to Robbie: I remember that during your 1995 AAA presentation of this paper, you showed a slide of yourself naked in your bed giving birth to your son, and while the audience

gasp, you stated, "Donna Haraway has said that she would rather be a cyborg than a goddess. Unlike her, I would rather be a goddess than a cyborg!" I think you might want to address that here.

Robbie to Joe: I don't know if I should put that in. It won't mean the same in print as it did when I could say it while showing the slide of myself giving birth. It is still true--I would rather be a goddess--a fully embodied woman, who knows that she IS her body, who accepts herself, her sexuality, her femininity, and her creativity, and whose life is an expression of all that. But I also know that my interdependence with technology makes me a cyborg, too. I mean, even during my home birth, during which I experienced myself as the embodied Goddess, I was also cyborg: the baby's heart tones dropped a bit during pushing, and my energy flagged; we were both helped by the oxygen I breathed through the mask the midwives put on my face, connecting me to the big friendly oxygen tank in the corner. So I don't know how to grapple with that in print. Haraway talks about cyborg goddesses--but I don't think that's what I mean. Lots of questions, like the one you asked me earlier: can cyborgs be holistic? organic? Does a rejection of the overtechnologization of birth constitute a rejection of the cyborg itself?

Joe to Robbie: To me this is what makes cyborg such a powerful concept: it can be all of this: very open, or very specific and terrible, or very specific and positive. I'm personally unconvinced that current notions of holism and environmentalism don't presuppose a natural or originary world that doesn't exist: e.g. Haraway points out to the outdoorsy Santa Cruz students that their love of nature and natural parks and so on is predicated on those parks being relatively inaccessible to the majority of the population who are too poor to enjoy them, and on the notion that the state can continue to keep the Native Americans--who still ask to reinhabit those lands--off of them. I'm completely in sympathy with your definition of a goddess and I think you should repeat that in this article and then ask again whether that is incompatible with being the cyborg that you already are. I'm in favor of leaving it as a question--cyborgs are supposed to be troubling, not solved. Besides, all Good Cyborgs are continually asking what is a better way to go about things, better for the planet and all of its creatures and creations.

Robbie to Joe: Hmmm....

For a deeper understanding of my own dichotomies, I look to the midwives upon whom my current research now focuses. For example, home birth midwife and PhD candidate Janneli Miller is the rare individual who lives, like me, in the worlds of midwifery and organic childbirth and in the world of anthropology. When I ran into Janneli at a midwifery convention, our eyes met in common understanding and she said to me, "You know, of the two worlds, this is the one where I feel most at home. Anthropologists think they're so cool, and so grounded--they talk about embodiment but live in their heads. Until you hang out with midwives, you don't know what 'cool and grounded' really is."

I serve on the Board of the North American Registry of Midwives, the agency in charge of setting up and administering the first process of national certification for direct-entry midwives (which leads to a new credential: the Certified Professional Midwife (CPM))--and I know firsthand how hard they are working to carve out a space in the technocracy for their holistic approach to birth and for the apprenticeship model of learning that fosters and preserves it. Persecuted and harassed by the medical system, independent midwives (nurse- and non-nurse alike) who work in homes and birth centers often risk arrest and jail to offer women the only viable alternatives to the cyborgification of birth that exist in the technocracy.⁵ I am committed to their study and their service, as I am equally committed to the study and the service of the hospital-based nurse-midwives who struggle daily with the tension between organic and cyborg childbirth, and who do their best to create for women who give birth in the hospital the space within which to generate many unique and creative unions of the cyborg and the woman. They apply the technologies that make women and hospitals feel safe; at the same time, they nurture, hold, love, and empower the woman to remain (should she so desire) the goddess, the giver of birth--cyborg though that Goddess may be. Thus it seems to me unfortunate that at this point in time it is far easier to find American anthropologists intensively studying every aspect of technologized reproduction than to find them intensively studying midwives and the hospitals, homes, and birth centers where they ply their womancraft.

The Body in Cyborg Anthropology?

To deconstruct biological reality is as challenging and fascinating as the deconstruction of conceptual reality. The seductive thrill of the new reproductive technologies (NRTs), which scramble, invert, and subvert what we used to take for granted as the basic human reproductive

mode, meshes neatly with our current anthropological immersion in the multiplicity, diversity, complexity, and ambiguity central to postmodern approaches and analysis. And it is new in the human experience. Thus it is hardly surprising that anthropologists should themselves be so seduced by the NRTs that they neglect the study of organic conception, gestation, and birth. And yet I would suggest that this state of affairs is unacceptable in our field. We are mammals: we live in bodies of flesh and bone and blood, we eat, drink, excrete, have emotions and orgasms, live, age, and die. Babies (still) grow in our wombs, we (still) birth them with sweat, and blood, and tears, and it is a scientific reality that no formula company has ever come up with a crib toy as intellectually stimulating as a mother's face or a recipe that is as good for our children as the milk that spurts from our breasts. (So basic is that milk to our deep being that we and our primate cousins are generically defined by it: the word *mammal* means "of the breast.") The hormone (oxytocin) that flows through our bodies to stimulate labor is the same hormone that flows through us as we make love with our partners and breastfeed our babies, showing us that these biologies have more in common than we knew, and teaching us as women that, like having orgasms, the intense and stimulating sensations of giving birth and breastfeeding⁶ are integral parts of our biosexual birthright (Newton (1972, 1973, [1955]1977; Newton and Newton 1972⁷). Women I have interviewed who know this for a fact often ask their husbands to make love to them throughout labor: nipple stimulation increases oxytocin levels and makes labor more effective, clitoral stimulation provides islands of intense pleasure in an ocean of intense pain! Can we grapple with such biologies? I want an anthropology that talks the language of the birthing body as fluidly as cybertalk, an anthropology that probes these complexities of organicity as rigorously as it deconstructs cybernetics.

My discomforts and disquiets with cyborg anthropology just recently crystallized around this quote from Donna Haraway (1997:213-265) entitled "Universal Donors in a Vampire Culture: It's All in the Family. Biological Kinship Categories in the Twentieth-Century United States":

I am sick to death of bonding through kinship and "the family"; and I long for models of solidarity and human unity and difference rooted in friendship, work, partially shared purposes, intractable collective pain, inescapable mortality, and persistent hope. It is time to theorize an "unfamiliar" unconscious, a different primal scene, where everything does not stem from the dramas of identity and reproduction. Ties through blood-- including blood recast in the coin of genes and information--have

been bloody enough already. I believe that there will be no racial or sexual peace, no livable nature, until we learn to produce humanity through something more and less than kinship.

While I can only applaud Haraway's expanded vision of a humanity that transcends kinship, it leaves me confused. What to do with the very real fact that almost all of the women I interviewed, no matter how technological their births, reported to me that the physical and emotional act of bonding with their newborn baby immediately after birth was the most important element of the entire experience? What to do with the entire field of pre- and perinatal psychology (see Chamberlain, this volume), which insists, based on extensive evidence, that the unborn child in the womb is conscious--hears, feels, sees, learns, and remembers--and that experiences received in the womb and during birth can imprint powerfully on the psyche and have a major influence on development?

Joe to Robbie: I like this specific dialogue with Haraway. It would be nice if you could expand it even more--and take on the question of whether you think the bonding experience with the baby is something that can help work through the racism, sexism, wars of blood? Or whether it is to the side of this. My particular reading of Haraway here is that she is starting with your response, and then asking: even if this mother-baby bonding is the most intense experience, is it the means to ground a notion of humanity, of caring for others who are not our babies? Yes, it is incredibly important, but doesn't the generalization of this experience to bonding-in-general suggest that because it is the most intense, it should also therefore be proof that my blood-kin are worth more than others to me, worth enough even to go to war over, or to discriminate against?

Robbie to Joe: It's the patriarchal cooption of "bonding" that gives us wars over kin! Men's fixation on being blood kin has led them to commit massive repression of women's sexuality and freedom in order to ensure the purity of their precious patrines.

Joe to Robbie: If not (and I'm forcing the issue here), then there seem to me to be two perspectives left: (1) universal--mother-baby bonding is the most intense experience, but not qualitatively different: it is just the most intense example of all of our human-bonding. Or (2) this bonding is totally special and completely separate and unique--it is one-and-two (not blood or genes), and unlike any other relationship, and therefore it should

not be biologized into kin. With these senses we could desire that our relationship with humanity be something that is more and less than kinship ñ more intensity of felt connection and far less biology.

Robbie to Joe: OK. Then I want something more and less than kinship too! But I still don't know how to reconcile Haraway's call for an end to the bloodiness of blood kinship with the realities that a baby's experience in the womb and immediately after birth will affect its experience of life. If the fetus is conscious, as Chamberlain insists, what might be the effect on that consciousness of the "transcendence" of kinship that results from being created in a test-tube, gestated by one mother, and nurtured by another? Who knows? If all of that is done with love, maybe cyborg babies will experience themselves as both uniquely created and uniquely loved.

But what I see in doctor's offices and hospitals isn't that. As we make our babies cyborg throughout pregnancy and birth, no one asks how they feel about the high-pitched ultrasound waves they hear, about the invasion of the amniocentesis needle, about electrodes being screwed into their scalp during labor, about losing the amniotic fluid that cushions them from the contractions when the sac is ruptured by some MD in a hurry. What price must our babies pay so that we can have Information? What happened to Mystery and Trust, and Acceptance of What Is? Now that we can control almost everything about who and what we reproduce, to choose not to exercise that control begins to look like negligence. So, wanting to be safe, responsible parents, we opt for the technology and the control without realizing that our babies are the ones who will pay the technological piper.

In most hospitals, immediately after birth, babies are scrubbed, pricked for AFP testing, stuck with a needle for a vitamin K shot, laid on a cold scale to be weighed, and have antibiotics stuck into their eyes to prevent the blindness that might occur if their parents have VD. To a newborn used only to the wavy warmth of the womb, these kinds of procedures are both painful and terrifying. This post-birth cyborgification of the newborn interferes with the development of sensed relationship between mother and child--the sensing of mouth to nipple, smell to smell, skin to skin, eyes to eyes.⁸ This mutual sensing, if allowed to happen at all, is often terminated at the end of the ten-minute

"bonding" period that many hospitals allow, and the baby is whisked off to a nursery for a four hour observation period. If s/he cries, the nurse may stick a plastic nipple attached to a bottle of sugar water in her mouth, which may later interfere with her ability to breastfeed. This kind of cyborgification doesn't transcend kinship, it mutilates it, and it is a crime against the mammalian nature of mother and child.

By all means, let us transcend the kinship that ties us to bloody wars and racial hatred in its name. But let us not scorn, or devalue, or ignore, or prevent, the deep sense of relatedness that, assisted by a flood of hormones, can, if we would but allow it, develop between mother and child (artificially or naturally conceived) when the bonding experience itself is not rendered cyborg by the persistent intrusion of procedures, technologies, and nursery care.

Joe to Robbie: I can tell you what I don't like about this line of reasoning: it appears to set things up so that recognizing the cyborg in us, in our ways of living (good and bad), in our own births, and in our midwives ends up being equated with all that is truly terrible with hospitals. As if women weren't the first tool-users, as if midwives weren't among the first professionals, the first experts, the first to experiment with formalized techniques and technological assistance in childbirth. If certain traditions of medicine perverted this, and if much of hospital birthing practices ignore what was innovative and life-giving about this midwifery, and if many of them seem caught up in technology-for-technology's sake, is that reason to give up seeking to distinguish what is good about cyborg practices? Use and abuse seem to be collapsed here.

Robbie to Joe: I do not mean to collapse them! Instead, I draw on our Introduction, where we speak of the four different uses of the concept of cyborg that are at work in the chapters in this volume: (1) the cyborg as positive technoscientific progress; (2) the cyborg as a mutilation of natural processes; (3) the cyborg as neutral analytic tool and metaphor of all human-technological relationships; and (4) the cyborg as signifier of contemporary, postmodern times in which human relations with technoscience have changed for better and for worse. You are invoking (3), and (4), while I am invoking (2). To invoke one to make a point is not to deny the others. Sometimes rendering a natural process

cyborg is mutilating, as I describe above, sometimes enhancing, as you point out.

From the first time we sharpened a digging stick, wove a bag to carry a baby, or used a stethoscope to listen to a baby's heart, we have been enhancing our lives through technology and, according to some analysts, cyborgifying ourselves. I have been talking to Brigitte Jordan about these issues, and she says the crucial questions are not whether this is good or bad, but "Who controls the technology? Who owns it, who can speak authoritatively about it, and for whose benefit is it used?" Is the woman with the stick digging because she chooses, or because someone else is exploiting her labor? Again, who benefits? There is all the difference in the world between a midwife listening to my baby's heart to glean information that can benefit the child, and being hooked up to an electronic fetal monitor so that the hospital can protect itself from lawsuit.

I agree that to frame midwifery technologies as cyborg is to take away ownership of the seduction of the cyborg from the patriarchy--to broaden the concept thus is to allow anyone to own that seduction. And that's the crux of it, Jordan says. Who owns the technology? Who benefits? Who controls? Maybe to the above four uses of cyborg we should add (5) the cyborg as oppressor, and (6) the cyborg as liberator. For they are all part of the human cyborg story that we are trying to tell in this book. If I overfocus on (2) cyborg as mutilator, and (5) cyborg as oppressor, it's not to collapse use and abuse, but rather because I think society--and anthropologists!--tend to overfocus on all the rest and leave out the shadow side of the cyborg story.

In the world of midwifery and alternative childbirth in which I spend much of my professional time, it is a given that the manner of birth will influence the manner of life, that babies born gently into loving hands, and gently treated after birth, will have a better chance at becoming gentle and loving people. Anthropologists appear to make no such unprovable assumptions. So far apart are my worlds sometimes that even though my special skill is translating between them, often I cannot. Here is a recent example. Through years of involvement with alternative birth, I became aware of the problematic nature of male circumcision. I have seen videos of babies being circumcised--their screams of pain, their efforts to get away from the knife, are horrifying to behold (Milos 1989). I have learned that there is no medical justification at all for this procedure (see Chamberlain, this volume)--

no benefit, only the loss of the tremendous sexual sensation that comes from the movement of the penis inside the foreskin--the foreskin that is cut off during circumcision is the most sensitive part of the glans (Boyd 1990; Diamond 1994:139-145). Men circumcised in their 20s report that their sexual pleasure plummets from a "ten" to a "two" after circumcision; men who go to extreme lengths to reverse their circumcisions through foreskin restoration report that their sexual pleasure rises exponentially for every inch of foreskin re-growth they achieve (Boyd 1990: 69-71,86; Bigelow 1992). For me this information is now fact, the same way it is a fact that home birth is safer than hospital birth. Yet I recently found myself completely unable to convince some of my close anthropological colleagues not to circumcise their newborn children.

I am surprised that I even tried, as I long ago gave up talking to women about giving birth at home. The idea that only hospitals and their technology can make birth safe so permeates this culture that there is simply no point in trying to convince anyone otherwise, even though it is completely untrue and there is plenty of scientific evidence out there to prove it (see Enkin, Chalmers, and Kierse 1989; Goer 1995; Wagner 1994). There are 35,000 practicing obstetricians in the U.S. today, most of whom are busy convincing the 94% of American birth-giving women they see that they have to be cyborgs to have babies. And there are around 7000 practicing nurse- and direct-entry midwives trying to empower women to give birth as they are, not as the culture wishes to make them. I know that if I could reverse those figures, so that 35,000 midwives would be attending 94% of the pregnant women (with a few thousand obstetricians available for the few real emergencies), prematurity, Cesarean, and perinatal mortality rates would drop dramatically, breastfeeding and maternal satisfaction would increase, and \$40 billion a year would be saved--enough to more than eliminate the financial crisis in our health care system. I try not to think about it, but when I do, it drives me absolutely crazy. We are spending billions of dollars on birth machinery and the new reproductive technologies, and very few on the doulas and midwives who could truly make birth better.⁹

And so it is with enormous pain and ambivalence that I view the cyborgification of birth and of anthropology. The seductive potential of the cyborg, so fraught with the dangerous possibilities and infinite expansions of Haraway's vision, is incredibly coercive and cooptive. It's very cool to analyze the human-machine symbiosis of a woman hooked up to the EFM as cyborgian; it's very uncool to know that the price she may pay for being that kind of cyborg is an unnecessary

cesarean. When I see the entire obstetrical staff of a given unit hanging out in the hall staring at the computerized monitor banks, instead of hanging in with the women in labor, rubbing their backs and holding their hands (see Cartwright, this volume), I want to scream that this is wrong, this is a distortion, a perversion, of what we could have become. I want to beat down the doors of the insurance companies with the news that if they would only pay for a doula to spend the entire labor one-on-one with the woman, they would reduce the length of labor and the cost of its "management" by more than one third, and improve both physical and psychological outcome for mother and child (Klaus, Kennell, and Klaus 1993). When I see cyborg babies in the NICU full of tubes and wires who were born prematurely simply because the doctor decided to induce labor or "take the baby" too early, I want to yell at the women who allowed this to happen that we are responsible for demanding evidence-based care¹⁰ that reflects our individual realities, not the technocratic norm. When I see women destroying their immune systems with antibiotics on the one-in-ten chance that a given NRT will work for them, I want to hold them in my arms, grieve with them for their pain, and talk about dealing with the emotional issues that may be blocking their efforts to conceive (Payne 1997), about adopting a non-cyborg baby, or about a book by Jane English called Childlessness Transformed.

But I don't do any of those things. Instead, like the good professional anthropologist I try to be, I take on the task of trying to grapple with, analyze, interpret, explain, and perhaps in some small way influence the cyborgian wave that is sweeping us as a species towards a future that our planet may not have the resources to sustain. I don't know if that's the best I can do, or a total cop-out. For sixteen years now I have striven for balance in my analytical approach. Even as I have learned the very real dangers of epidurals to both mother and baby, I have refused to judge the women who demand epidurals and schedule their Cesareans between conference calls; instead I have interviewed them extensively, exploring their self and body images and coming finally to understand the complete correspondence between those disembodied images and the kind of births they choose (Davis-Floyd 1994b,c). As I noted above, I work ethnographically with certified nurse-midwives whose approach to birth is often as high-tech as any obstetrician's, and with independent midwives whose approach to birth is generally non-interventive. My heart is with the latter but I have utmost respect for the former; like the professional women who demand epidurals, nurse-midwives have made the choice to succeed within the system, not outside of it--as have I. I also study aerospace engineers who are actively engaged in shaping human futures by

commercializing outer space (Davis-Floyd 1998)--hardly the transcendent vision of Gene Roddenberry's Star Trek but nevertheless a happening thing. In all these arenas I have struggled with the question of the dual responsibilities I feel between studying what is and raising a ruckus about what should be.

I have often thought about becoming a birth activist, but I find that I value the balance of the anthropological approach, the distancing move an anthropologist can make any time she finds herself in danger of caring too much. For she knows that any story, no matter how compelling, how juicily organic, or how cyborgian, is still just one of the thousands of stories that we humans make up about the world. No story can be taken too literally, no cause espoused too rabidly, when one can take the safe conceptual stance that it's "just another paradigm"--a passionless stance I often see students adopting. I value my discipline, but sometimes I want to yell at anthropology too. As we rush to analyze cybertalk and technosex, are we/should we/must we help to entrench the realities they represent?

The lead chapter in this book deals with technosemen--semen that has been artificially lavaged and manipulated to contain only the healthiest sperm. The authors note that some sperm banks nowadays, on the basis of evidence that pollution can reduce sperm counts, recommend that married couples who live in polluted areas should have the husband's sperm "lavaged" to select out the healthiest sperm and injected by artificial insemination. It took me some time to notice that the intellectual excitement of their argument had caused me to gloss over the very serious threat to our future bodies posed by areas in which pollution levels are so high. Likewise, it was an intellectual turn-on when, during my fieldwork with aerospace engineers, I was able to see that the thousands of satellites that will soon be ringing the planet, sucking information up from it, zinging it back and forth, and beaming it back down, are reconstructing Gaia herself as a techno-organic system, an emergent cyborg.¹¹ The seduction of that concept almost prevented me from seeing that all those microwaves could have serious effects on the ecosystem (and thus on the human future), as could the increasing number of satellite launches that punch holes in the atmosphere, scattering gases and debris.

Goddess knows, every time I ask a techie at Motorola or Johnson Space Center or Draper Labs how far technology can take us, they say there are no limits, none at all. In the unlimited potential of the nano-technologies that can penetrate and interact with our living cells and the macro-technologies that launch rockets the size of skyscrapers to

carry us into outer space, there is nothing to keep us from evolving as cyborgs--nothing, that is, except the finite amounts of oil, coal, gas, and minerals that exist on this planet. Not to worry! There is a physicist in my home town who is staking his career on the possibility of extracting energy from the zero-point vacuum. If he succeeds, maybe technolife on this planet will stop being a zero-sum game, and we can all become cyborgs in any way we choose. If we run out of minerals, we will have plenty of energy available to go mine Grandmother Moon, and then, like her daughter the Earth, she can become a cyborg too.

Joe to Robbie: Here again I wonder if you are painting yourself into a corner insisting that cyborgs =anti-environmentalism, and therefore implying that there were humans who were natural and not cyborgs, and that "natural" naturally leads to good living. I'm using the term cyborg here in its doubled sense: a lot that is bad and a lot that is good. Useful to think with because it is both natural and technological, always questioning.

Robbie to Joe: I am NOT insisting that cyborgs=anti-environmentalism. You have convinced me that humans, like cyborgs, can be anything except 100% natural and organic--everything we (cyborgs and humans) do is culturally (read:technologically) mediated. I guess it's just a matter of degree--more or less organic, more or less embodied, more or less of technology or of the earth. I am not essentializing here--I am well aware that biological processes are culturally patterned, and that biology only takes on meaning through culture. After all, isn't that the great anthropological insight: that there is no "natural" for us, that to be human means to mediate everything through culture? Let's return to Brigitte Jordan's crucial questions: Who owns the technology? Who controls it? For whose benefit is it used? Shall the technological artifacts that make us cyborg be the instruments of our liberation, or of our further oppression? Those questions are as relevant for mining the moon as for giving birth.

If we are all cyborgs now, then may our cyborgification give new meaning to the concept of freedom of choice. May we be as free to choose biology as technology, as free to evolve ourselves as conscious, organic, natural, embodied, mammalian, earth-based, biology-respecting cyborgs as to evolve ourselves as the cyborgs of high-tech. That's not the way it's going so far, Joe, but that's not the fault of the cyborg but of the humans who supervalue

the "cyb" and trash the "org." Maybe, as we move into the new millenium, we can find a way to honor both.

Notes

Acknowledgments

This chapter is an expanded version of a paper that was originally written for oral presentation at the 1995 meetings of the American Anthropological Association in Washington D.C. during a panel on "Cyborgs in Cyberspace or Humankind in Space and Time?: The Rhetorics and Analytics of Cybertalk in General Anthropology." My thanks to the panel organizers, David Hakken and Jennifer Croissant, for the opportunity to crystallize these reflections. Thanks also to Joe Dumit for the joys of collaboration and for his excellent editing skills.

1. It is important to understand that birth, when completely left alone, turns out well more than 90% of the time when the mother is healthy, well-nourished, and receives adequate social support. The cascade of obstetrical interventions that mutilate and prosthetize the natural process of childbirth was originally designed to circumvent the small percentage of problems that can arise. But instead of being reserved for times when they are truly needed, these interventions have for decades been applied in standardized and blanket form to all births, turning even normal births into cyborg productions and technodazzle displays of our society's fascination with and dependence on the technological wonders it creates.

2. Four years later, as I was interviewing physicians to see if any of them would agree to provide backup for the home birth of my second child, one of them, the head of obstetrics at the biggest hospital in Austin, asked me "What do women want anyway? I had a woman in here this morning crying because she had a Cesarean. And yesterday a different woman cried in my arms because her baby had died. Why can't the ones who are lucky enough to have healthy babies just be satisfied with that?" As if all women should want the same thing. As if joy can't be permeated with grief. As if the physiological commonalities and regularities of the birth process generate emotional uniformity too. Women, like the childbirth that is uniquely their own, cannot be standardized.

3. In this, childbirth educators differ from the majority of their clients, who believe in their right to pain-free childbirth and prefer the monitors and drugs. This discrepancy sets up a tension in the field of childbirth education between women who want to feel no pain,

educators who know the dangers of drugs and the value to mother and child of drug-free birth, and hospitals who insist that the educators must encourage women to have epidurals for economic reasons. Indeed, I have spoken with many hospital-based birth practitioners--midwives, nurses, and childbirth educators--who say that whenever they encourage their clients to give birth without drugs, and the clients take them up on it, the anesthesiologists come knocking on their doors to say that their livelihood is being threatened and that the practitioners had better stop their advocacy of natural childbirth or face the consequences. Is cyborgification contagious? In this case, it would seem so.

4. The typical postmodern midwife carries myriad technologies with her to home births. For a full list, see Davis-Floyd and Davis 1996.

5. Midwives who attend home births practice legally in some states, illegally in others, and alegally in a few. In some places, they find insurance coverage, physicians willing to provide emergency backup in case they need to transport their clients to a hospital, and a supportive medical system. But in many others, they experience direct persecution by the medical establishment. This persecution takes many forms: physicians refuse to provide backup and actively harass any other physicians who do. State agencies send in a couple posing as potential clients, who get the midwife to admit that she attends home births and then arrest her for doing so. The police burst in and search the midwife's home for medical paraphernalia. A midwife is handcuffed and jailed simply for attending home births. This harassment extends not only to direct-entry midwives but also to certified nurse-midwives who attend home births.

Homebirthers in general are a self-reliant bunch who operate under an alternative model of reality that does not define women's bodies as dysfunctional machines in need of medical care. In other words, they eschew the beliefs and values of the technocracy in favor of their alternative reality. And the system, which has very limited tolerance for this sort of thing, often retaliates with force. I think I would not have as much trouble with the notion of the cyborg were the forces of our cyborgification not so powerfully aligned with the same cultural forces that persecute midwives, suppress home birth, encourage Cesareans, and log old-growth forests. Haraway sees cyborgs as subversive, but from my vantage point, they look awfully hegemonic.

6. Marshall Klaus, John Kennell, and Phyllis Klaus provide a compelling account of the complex biological effects of breastfeeding after birth:

[When the newborn nurses at the mother's breast, or even simply licks the mother's nipple after birth, this] leads to the release of oxytocin (the let-down reflex) by the mother [which hastens the after-birth contractions of the uterus needed to deliver the placenta and reduce bleeding]. After breastfeeding is underway, the sight or a reminder of the infant results in the let-down reflex. Each suckling period increases the oxytocin level, which has a calming effect on the mother and also tends to increase the tie the mother has to the infant. The latter effect is the reason oxytocin has been called the "cuddle hormone." In addition, when the infant suckles from the breast, there is a large outpouring of twenty different gastrointestinal hormones in both the mother and the infant, including cholecystokinins, which stimulate the growth of the baby's intestines and increase the absorption of calories with each feeding. The stimuli for this release are carried by the mother's nipple and the inside of the infant's mouth....Whenever the nipple of the mother is touched, either by the infant's lips or by a finger, there is a fourfold to sixfold increase in her prolactin level. After breastfeeding begins, the level decreases. These changes in prolactin levels induce the alveoli of the breasts to produce milk.

Women who, through nipple stimulation by the baby, have been able to breastfeed their adopted babies have also reported the rapid development of strong feelings of closeness and attachment while breastfeeding. In these situations, skin-to-skin contact, touch, smell, body warmth, and auditory and visual stimuli, as well as maternal hormones, probably all operate together to promote attachment. (Klaus, Kennell, and Klaus 1995:84-85).

7. Niles Newton's work on the sexuality of birth and breastfeeding and the interplay between Western culture and women's physiology was groundbreaking at the time, is still on the cutting edge of biocultural research, and deserves far more attention from anthropologists than it has received.

8. For example, a study conducted by Widstrom (1990) found that mothers whose babies hands or mouth touch its mother's nipple during the first hour after birth kept their babies in their rooms significantly longer than mothers who did not have this contact. Another study found that newborns in skin-to-skin contact with their mothers cry less than babies who are wrapped and placed in bassinets (Klaus, Kennell and Klaus 1995).

9. For example, back in 1974 two certified nurse-midwives were put in charge of all normal births in a small county hospital in California for three years in an experimental pilot program. During that time, the rates of obstetrical intervention fell dramatically, the incidence of prematurity dropped almost by half, and neonatal mortality dropped from 23.9 per thousand to 10.3 per thousand--less than half of what it had been before the midwives arrived. At the end of the three years, fearing the competition, the local obstetricians fired the midwives and resumed charge of all births in this hospital. Within a few months, the rates returned to their former high levels (Levy, Wilkinson, and Marine 1971).

A further example: A doula is a supportive female companion who attends women in labor. Sosa, Kennell, Klaus, and their associates, working first with Guatemalan women, and more recently with women in a large charity hospital in Texas, have proven the physiological value of the doula (1980, 1986, 1988). Their studies all involve comparison of results of normal hospital labors with labors of women attended one-on-one by a doula. Somewhat caustically, Kennell summarizes their dramatic results in technocratic context:

If I told you today about a new medication or a new electronic device that would reduce problems of fetal asphyxia and the progress of labor by two-thirds, cut labor length by one-half, and enhance mother-infant interaction after delivery [as does the presence of the doula], I expect that there would be a stampede to obtain this new medication or device in every obstetric unit in the United States, no matter what the cost. Just because the supportive companion makes good common sense does not decrease her importance. (1982:23)

10. Most standard obstetrical procedures, such as routine use of electronic fetal monitors, ultrasound, episiotomy, etc. are not supported by scientific evidence. A number of scientists and obstetrical practitioners have begun to demand a move toward "evidence-based care--that is, care that reflects the realities of a large and growing body of relevant data. Sophisticated meta-analyses of all available scientific studies in obstetrics up to 1989 have been carried out and published in the authoritative 1500-page work Effective Care in Pregnancy and Childbirth, Volumes I and II (Chalmers, Enkin and Keirse 1989). An abridged version, entitled A Guide to Effective Care in Pregnancy and Childbirth (Enkin, Keirse, and Chalmers 1989), which makes the information in the larger work easily available to the public was also produced. New information is regularly published

electronically through the Cochrane Database on Pregnancy and Childbirth, Manor Cottage, Little Milton, Oxford OX44 7QB, UK. In the USA and Canada, contact Canadian Perinatal Clinical Trials Network, Local D0-705, Hospital St.-Francois d'Assise, 10 rue de l'Espinay, Quebec, Canada G1L 3L5 (418-525-4455; fax 418-525-4481; e-mail: 3028wfra@vmi.ulaval.ca). The database is available on disk and CD-ROM for IBM and Apple MacIntosh computers.

11. In her Foreword to The Cyborg Handbook (1995), Donna Haraway makes the case that James Lovelock's original conceptualization of Gaia was as a cybernetic system, a cyborg. This poses the question: Could there be cyborgs before there were humans? --a possibility I am not willing to buy into. The ecosystemic earth before the evolution of high-technology humans was whatever it was, but it was not a cyborg. For me, cyborgs are the result of the fusion of humans with human-created technology. That technology, only now, is finally and ultimately cyborgifying the earth.

References

Bigelow, Jim

1992 The Joy of Uncircumcising. Hourglass Book Publishing, P.O. Box 171, Aptos CA 95001.

Boyd, Billie Ray

1990 Circumcision: What It Does. San Francisco: Taterhill Press.

Davis-Floyd, Robbie E.

1987 "Obstetric Training as a Rite of Passage," Medical Anthropology Quarterly, Vol. 1, No. 3, pp. 288-318.

1990 "The Role of Obstetrical Rituals in the Resolution of Cultural Anomaly," Social Science and Medicine Vol. 31, No. 2, pp. 175-189.

1992 Birth as an American Rite of Passage. Berkeley: University of California Press.

1993b "The Technocratic Model of Birth" in Feminist Theory in the Study of Folklore, eds. S. Hollis, L. Pershing, M.J. Young, U. of Illinois Press, pp. 297-326.

1994a "The Rituals of American Hospital Birth." Conformity and Conflict: Readings in Cultural Anthropology, 8th edition. New York: Harper Collins, pp. 323-340.

1994b "The Technocratic Body: American Childbirth as Cultural Expression," Social Science and Medicine. 38:2.

1994c "Mind Over Body: The Pregnant Professional" in Many Mirrors: Body Image and Social Relations, New Brunswick NJ: Rutgers University Press.

1995 "Introduction" to Anne Frye's Holistic Midwifery: A Comprehensive Textbook for Midwives in Homebirth Practice. Volume 1, *Care During Pregnancy*. Portland Oregon: Labrys Press.

1998a The Technocratic Body and the Organic Body: Hegemony and Heresy in Women's Birth Choices. New Brunswick NJ: Rutgers U. Press.

1998b "Commercializing Outer Space: Profit, Paranoia and Paradox in the Futures Planning of the Aerospace Industry." In Corporate Futures, George Marcus ed. University of Chicago Press.

Davis-Floyd, Robbie and Elizabeth Davis

1996 "Intuition as Authoritative Knowledge in Midwifery and Home Birth," Medical Anthropology Quarterly 10(2): 237-269.

Davis-Floyd, Robbie and Carolyn F. Sargent

1997 Childbirth and Authoritative Knowledge: Cross-Cultural Perspectives. Berkeley: University of California Press.

Davis-Floyd, Robbie, and Gloria St. John

1998 From Doctor to Healer: Physicians Shifting Paradigms. New Brunswick NJ: Rutgers University Press, in press.

Diamond, Jared

1994 The Warrior's Journey Home. Oakland Calif: New Harbinger Publications.

English, Jane E.

1988 Childlessness Transformed: Stories of Alternative Parenting. Mt. Shasta Calif: EarthHeart Publishing.

Enkin, Murray, Marc Keirse, and Iain Chalmers

1989 A Guide to Effective Care in Pregnancy and Childbirth. Oxford: Oxford University Press.

Goer, Henci

1995 Obstetric Myths versus Research Realities. Westport CT: Bergin and Garvey.

Haraway, Donna

1991 "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." In Simians, Cyborgs, and Women: The Reinvention of Nature, pp. 149-181. New York: Routledge.

Haraway, Donna

1997 *Modest_Witness@Second_Millennium.Female Man^c_Meets_OncomouseTM : Feminism and Technoscience*. New York: Routledge.

Kennell, John

1982 "The Physiologic Effects of a Supportive Companion (Doula) During Labor." In Birth: Interaction and Attachment ed. Marshall H. Klaus and Martha O. Robertson. New Jersey: Johnson and Johnson.

Kennell, John, and Marshall Klaus

1984 "Mother-Infant Bonding: Weighing the Evidence," Developmental Review 4:275-282.

Kennell, John, Marshall Klaus, Susan McGrath, Steven Robertson, and Clark Hinckley

1988 "Medical Intervention: The Effect of Social Support During Labor." Pediatric Research April:211 (Abstract #61).

Klaus, Marshall H., and John H. Kennell

1982 (orig. pub. 1976) Parent-Infant Bonding. St. Louis: C. V. Mosby Co.

1983 "Parent to Infant Bonding: Setting the Record Straight," Journal of Pediatrics 102(4):575-576.

Klaus, Marshall H., John Kennell, and Phyllis Klaus

1993 Mothering the Mother: How a Doula Can Help You Have a Shorter, Easier, and Healthier Birth. Reading Massachusetts: Addison-Wesley.

1995 Bonding: Building the Foundations of Secure Attachment and Independence. Reading Massachusetts: Addison-Wesley.

Klaus, Marshall H., and Phyllis Klaus

1985 The Amazing Newborn. Reading, Mass.: Addison-Wesley.

Milos, Marilyn F.

1989 "Male Circumcision: An Eyewitness Account." Unpublished ms. For a copy, or for information about male circumcision, contact Marilyn F. Milos, NOCIRC, 415-488-9883.

Parvati-Baker, Jeannine

1978 Hygeia: A Woman's Herbal. Monroe, Utah: Freestone Publishing.

1986a Conscious Conception: Elemental Journey through the Labyrinth of Sexuality. Monroe, Utah: Freestone Publishing.

1986b (orig. publ. 1974) Prenatal Yoga and Natural Birth (revised ed.) Monroe, Utah: Freestone Publishing.

1991 "The Deep Ecology of Birth: Healing Birth Is Healing Our Earth." Monroe, Utah: Freestone Publishing

1992 "The Shamanic Dimension of Childbirth," Pre- and Perinatal Psychology Journal, 7 (1):5-20.

Payne, Niravi

1997 The Language of Fertility. Harmony Books.

Righard, L., and M.O Alade

1992 "Sucking Technique and Its Effects on Success of Breastfeeding." Birth 19(4)185-189.

Villard, R.H., J. Orter, and J. Winberg

1990 "Does the Newborn Find the Nipple by Smell?" Lancet 344:989-990.

Wagner, Marsden

1994 Pursuing the Birth Machine: The Search for Appropriate Perinatal Technology. London and Sydney: ACE Graphics (U.S. distributor: ICEA Bookcenter, P.O. Box 20048, Minneapolis MN 55420).

Widstrom, A.M.,

1990 "Short-Term Effects of Early Suckling and Touch of the Nipple on Maternal Behavior." Early Human Development 21:153-163.

Cyborg Babies tracks the process of reproducing children in symbiosis with pervasive technology and offers a range of perspectives, from resistance to ethnographic analysis to science fiction. Cultural anthropologists and social critics offer cutting-edge ethnographies, critiques, and personal narratives of cyborg conceptions (sperm banks, IVF, surrogacy) and prenatal (mis)diagnosis (DES, ultrasound, amniocentesis); the technological de- and reconstruction of birth in the hospital (electronic fetal monitors, epidurals); and the effects of computer simulation games and cyborg toys and stories on...

Robbie Davis-Floyd *From Technobirth to Cyborg Babies: Reflections on the Emergent Discourse of a Holistic Anthropologist*. to analyze text content to discover emergent issues and controversies in diverse corpora. As a specific case study, I investigate the culture of microblogging academics within the dynamics of a professional conference to gain insights into the key issues and debates emergent in this community and the transformative effects of using Twitter in academic contexts. Microblogging academics can be considered a type of online community which has its own norms, rules, and communicative behaviors (Gruzd et al., 2011) that can be analyzed with anthropological methods (cf. *From technobirth to cyborg babies: Reflections on the emergent discourse of a holistic anthropologist*. In R. Davis-Floyd & J. Dumit (Eds.), *Cyborg babies: From techno-sex to techno-tot* (pp. 255-284). New York: Routledge. Google Scholar. De la Cruz, I., González-Oliver, A., Kemp, B., Román, J., Smith, D., & Torre-Blanco, A. (2008). Cyborg anthropology is a recent subspecialty launched at the Annual Meetings of the American Anthropological Association (AAA) in 1993. Within the AAA cyborg anthropology is associated with the Committee for the Anthropology of Science, Technology and Computing (CASTAC). From the start cyborg anthropologists have located themselves within the larger transdisciplinary field of Science and Technology Studies (STS), attending with frequency the annual meetings of the Society for the Social Studies of twelve *From Technobirth to Cyborg Babies: Reflections on the Emergent Discourse of a Holistic Anthropologist*. Part Four Techno-Toys and Techno-Tots. thirteen *Growing Up Cyborg: Developmental Stories for Postmodern Children*. fourteen *Inhabiting Multiple Worlds: Making Sense of SimCity 2000™ in the Fifth Dimension*. fifteen *Cyborg Babies and Cy-Dough-Plasm: Ideas about Self and Life in the Culture of Simulation*. sixteen *Children of Metis: Beyond Zeus the Creator: Paganism and the Possibilities for Embodied Cyborg Childraising*. notes on contributors. Index. Similar books.