Fetal Ultrasound Imaging and the Production of Authoritative Knowledge in Greece

In Greece repetitive and intensive fetal scanning is now a universal feature of prenatal care. This article examines some of the ways in which pregnant women and obstetricians experience the intensive use of fetal ultrasound in a small city in eastern Greece. Based on observations and interviews conducted in a public hospital, it is argued that fetal imaging plays a privileged role in the production of authoritative knowledge around pregnancy for both doctors and women. The authority of the technology rests primarily on its ability to create a straightforward sense of reality and visual pleasure. These qualities lead women to actively demand fetal scanning, which helps them to feel the reality of their pregnancies, reassures them of fetal health, and provides a pleasurable sense of contact with, and knowledge about, the fetus. Doctors freely offer multiple scans to attract women to the public hospital, to practice "modern" obstetrics, and to negotiate among themselves for control over the management of pregnant women. [ultrasound, pregnancy, technology, Greece, medical authority]

First used in the 1960s to monitor high-risk pregnancies, fetal ultrasonography is today a routine aspect of prenatal care in most industrialized countries. Though its use has become routine, women and practitioners alike recognize that ultrasound is not just another diagnostic tool used in pregnancy (Spitz 1990). As a part of the historical transformation of medicine brought about by "visualizing" technologies (Barley 1988; Kassirer 1992; Reiser 1978), the impact of ultrasound on the practice of obstetrics is deemed "profound" (Cunningham et al. 1985). With the rapid diffusion of the technology, this impact is becoming increasingly global. In Greece, where high-technology obstetrics has almost completely replaced local models of pregnancy and birth in a span of one or two generations, repetitive and intensive fetal scanning is now a universal feature of prenatal care.

This article examines some of the ways in which pregnant women and obstetricians experience the intensive use of fetal ultrasound in a small city in eastern Greece. To date, little is known of the diffusion of this technology outside

Medical Anthropology Quarterly 10(2):157–175. Copyright © 1996 American Anthropological Association.

the North American and western European contexts, and still less is known of the culturally inflected experiences of women and obstetricians as they interact with it.¹ Ethnographic material from Greece offers an opportunity to examine comparatively the role of ultrasonography in the ongoing medicalization of pregnancy and to explore the ways in which this reproductive technology helps generate power and meaning, as well as diagnoses and measurements.

In keeping with the theme of this issue I focus specifically on the ways in which fetal imaging collaborates in the production of authoritative medical knowledge within Greek clinical discourse and obstetrical practice. Authoritative knowledge, as Brigitte Jordan (1993[1978]:154) has argued, is knowledge that counts as legitimate and consequential. As authoritative knowledge is continually reinforced and reproduced through hierarchical social interactions, such as clinical encounters, other ways of knowing are delegitimized and dismissed (1993[1978]:152). Like the process of hegemony in general, authoritative knowledge involves the ongoing construction of consensus regarding what is thinkable and unthinkable (Williams 1980). As Jordan has observed, technologies of many sorts play an important role in the performance and display of authoritative knowledge because of their symbolic (as well as practical) value, their association with experts, and their expression of power and other significant relationships between persons engaged in a community of practice (1993[1978]:158).

Among the biomedical technologies deployed in the Greek context, I argue that fetal ultrasound plays a privileged role in the process of generating authoritative knowledge in prenatal care for pregnant women and doctors alike. To grasp this role more fully it is necessary to put aside commonsense understandings of efficacy (efficacy, in any case, remains unproven for the routine use of ultrasound in normal pregnancies)² and look instead to how the apparatus embodies and helps construct specific kinds of social, cognitive, and expressive order in the world (Pfaffenberger 1992; Winner 1985). From this perspective technology, as a consequence of its formulation in specific political and cultural contexts, is charged with what Corlann Bush has called a "valence": a bias or tendency "to seek out or fit in with certain norms and to ignore or disturb others" (1983:155). The valence embodied in a technology may "pull" actors toward specific patterns of use, as Sandelowski (1991) has demonstrated in her study of the "never enough" quality of conceptive technologies that compels couples to repeated treatment. As she points out (1991:31), such an approach complements a perspective from "outside" that focuses instead on how social forces "push" technology use in directions that reinforce broader cultural values and political agendas (e.g., patriarchy, pronatalism).

I contend that the particular valence of fetal ultrasound, and much of its impact and authority, have to do with its unique positioning at the intersection of popular and scientific technologies of the visual and with the codes and conventions for representing the "real" that are embedded in these technologies (see Duden 1993; Fiske 1987; Petchesky 1987; Sontag 1989). In ultrasonography the visual and the scientific—two highly significant components of the modern in Western culture are deliberately joined together. Indeed, in the history of the development of medical ultrasound the production of recognizable visual images emerges as a central goal, a goal that seems "to have been as important as an appreciation of what the electronic equipment could and could not do" in diagnostic terms (Yoxen 1987:301).

A focus on ultrasonography's valence, I argue, makes it possible to extend Jordan's insights regarding authoritative knowledge in a new direction: in addition to analyzing how the ultrasound apparatus is deployed in the hierarchical social interactions that produce authoritative knowledge, I also examine how ultrasound's inbuilt capacity for visualization of the fetus has the powerful potential to merge natural and technological processes, and in doing so, how it has the potential to produce a novel cognitive and bodily experience of pregnancy. By reconfiguring the way women first sensually apprehend the "reality" of their pregnancies, I argue that ultrasonography can act as an especially potent facilitator in the production and enactment of authoritative knowledge. Because doctors, as well as women, are enmeshed in the nontechnical, discursive aspects of medical technology and its scientific rationality, I also describe their subjective experiences with ultrasonography, a topic that has received little attention. Finally, I examine the unusually intensive use of this technology in the context of the political economy of Greek health care delivery.

Setting: A Public Hospital in Eastern Greece

This research was conducted over ten months as part of an ongoing study, begun in 1990, of Greek women's changing reproductive experiences. Most of the research described in this article took place in a public hospital in a small city in eastern Greece. This city, like Greece generally, is heavily dependent on massive seasonal tourism from northern Europe. With its comparatively prosperous economy, this cosmopolitan city attracts migrants from other parts of Greece and provides many amenities to its surrounding communities, including specialized medical services.

The public hospital I studied is part of the National Health System (ESY) established in 1983 by the socialist government that held power through most of the 1980s. The great majority of Greek doctors are employed at relatively modest salaries in publicly subsidized health care, with only about 15 percent in the private sector (Colombotos and Fakiolas 1993; Philalithis 1986). Most physicians employed by the ESY are not permitted to see private patients.

Generally speaking, Greek families who can afford them prefer private maternity clinics to the public hospitals, which often have low prestige and mainly serve poor women (Arnold 1985; Lefkarites 1992; Tzoumaka-Bakoula 1990). Indeed, the ultimate sign of "distinction" (in Bourdieu's [1984] sense) is to give birth in a private clinic in Athens, where the best "machines" and doctors can be found. In this context the public hospital I studied is unusual in that it is commonly perceived, as pregnant women and their husbands often explained, to be superior to the sole private clinic, as much for its stock of "machines" (*mihanimata, mihanes*) as for the high quality of its doctors. An additional attraction is that prenatal care is informally structured in such a way as to allow women to avoid the most common source of dissatisfaction with public hospitals: the lack of continuity in care (Dragona 1987). For reasons to be explained below, women attending the public hospital are able see the same obstetrician throughout their pregnancies. As a consequence of these circumstances the hospital draws a large number of women

not only from the city itself, but from the surrounding region as well, including many middle-class women who could afford to pay for private care. Annually, some 900 births take place in the public hospital (out of a national total of about 100,000).

Methods

In the public hospital I was allowed to observe and record the daily stream of prenatal consultations, ultrasound scans, and births, and was given access to records of birth outcomes for the 1980s. In addition to observation and informal interviews both with doctors and with women before and after ultrasound scans, I conducted structured interviews in Greek with nine obstetricians (all male), seven nurse-midwives (all female), and 26 postpartum women within one to three days of giving birth. These were young (average age 24.5 years) married women in almost equal proportions of working-class and middle-class backgrounds.³ All but three had just given birth to their first or second child. For comparative purposes I also visited the sole private clinic in the city. Interviews with its obstetricians revealed no notable differences in procedures and technologies from the public hospital.

Two months were also spent in Athens, the center of Greek medical education and the principal point of diffusion of new techniques and forms of knowledge. In Athens I observed the training of obstetrical residents in ultrasound techniques in a major teaching hospital, and interviewed professors of obstetrics on such topics as their views of ultrasonography and the content of their lectures to medical students.

Pregnancy and Birth in Greece: Modern Medical Hegemony

The redefinition of pregnancy and birth as technology-intensive medical events is one manifestation of the widespread modernization that has occurred in Greece since World War II. Throughout the country the modernizing process has produced an epistemological rupture in which old explanations and practices, local knowledges of the pregnant body among them, are being displaced by technological discourses, including the discourse of biomedicine (see Stewart 1991:117). Although part of a global process, this medicalization is far from universal and homogeneous. While proceeding rapidly, it proceeds unevenly. Some areas of knowledge (such as fertility control) remain relatively unmedicalized (Georges 1996). Furthermore, the medicalization of pregnancy and birth has taken place in a seemingly paradoxical cultural context of pervasive suspicion of the doctors themselves (Arnold 1985:231; Velogiannis-Moutsopoulos and Bartsocas 1989:214). The prevailing attitude in Greece has been succinctly summarized as "trust science, but be suspicious of physicians" (Arnold 1985:210).

Today lay midwives are all but extinct, and alternative discourses of nonmedicalized birth have yet to appear. Birthing at home has become unthinkable (young women sometimes laughed at the suggestion), and a technomedical model of pregnancy and birth is firmly in place (Bréart et al. 1992; Dragona 1987; Tzoumaka-Bakoula 1990). Hospital birth includes the routine use of pubic shaving, enemas, IV drips, pitocin to augment labor, electronic fetal monitors, episiotomies, the lithotomy position with arms and legs strapped to the delivery table, and, in the public hospital I studied, birth by cesarean section for about one-third of women. Pregnancy is intensively monitored through monthly prenatal visits with obstetricians, in which fetal ultrasound scanning plays a prominent role. The public hospital got its hand-me-down scanner from Athens in the mid-1980s, and soon thereafter fetal scanning became a routine procedure. By the 1990s no pregnancy went unscanned, and women typically had three to five scans over the course of a normal pregnancy. The modal number in my sample was four, but a few women had had up to seven. Normal pregnancies are scanned with ultrasound for a large variety of reasons, including to confirm a suspected pregnancy, chart fetal growth, establish due dates, ascertain presentation of the fetus, and, surprisingly often, to respond to a woman's request to "see the baby."

Such intensive monitoring of pregnancy is not a regional aberration, but reflects Greek obstetrical practice generally. Medical students in Athens are taught to do three scans per normal pregnancy, one each trimester, and a recent survey of over 500 normal pregnancies in Athens found that in fact, nearly all women (93%) had had at least one fetal ultrasound scan, with about one-quarter experiencing two or more scans in the third trimester alone (Bréart et al. 1992).⁴

The technomedical redefinition of pregnancy and birth has permeated women's everyday consciousness through a variety of routes. Universally accessible prenatal care probably provides the most direct exposure. In addition to intensive surveillance of pregnancy via batteries of tests, clinical examination, and ultrasound, monthly prenatal visits provide the occasion for monitoring women's behavior and for providing biomedical lessons. As one doctor described it, the obstetrician's role was "to explain to the woman what it means to be pregnant, what's happening inside of her." Much of the discourse in the prenatal visits I observed centered on questions of risk and maternal responsibility for the outcome of pregnancy. Women, and often their husbands, routinely asked doctors to advise them about a variety of behaviors (sexual relations, diet, taking medications and supplements, bathing in the sea)⁵ that were regarded as potentially risky for the pregnancy.

Technomedical definitions of pregnancy and birth also permeated women's everyday consciousness indirectly through such popular sources as magazines, television, videos, state-sponsored as well as private childbirth classes, and, in particular, the pregnancy guides read by over half (54%) of the women. Often seen on the bedside tables of postpartum women in the hospital, these guides offer readable, step-by-step descriptions of the technomedical model of pregnancy and birth. The most popular of these is Birth Is Love, written by an Athenian nursemidwife (Sikaki-Douka n.d.). Despite its sentimental title, *Birth Is Love* is largely devoted to educating women about how to become modern pregnant subjects, urging them, for example, to be prompt for appointments and precise and concrete in their reports to the doctor. It begins with several pages of reprints of Lennart Nilsson's widely known fetal photographs, which "reveal" to women the contents of their pregnant bodies, and devotes an entire section to fetal ultrasound entitled "Camera in the Uterus: Boy or Girl?" Thus both directly through repeated clinical encounters and indirectly through popular forms that translate expert knowledge. women's everyday consciousness is exposed to a model of pregnancy as biomedical event.

The Procedure: "Putting the Baby on Television"

The congruence of fetal imaging and popular visual technologies is explicitly acknowledged in Greek everyday usage. Ultrasound is most commonly referred to as "television" *(tileorasi)*, and doing an ultrasound is referred to as "putting the baby on television" *(na valoume to moro stin tileorasi)*.⁶ Television is an apt metaphor for fetal ultrasound imaging in Greece. It is ubiquitous and provides a major vehicle for the dissemination of images of modernity, the West, and "modern" behavior throughout Greece (Handman 1983; McNeill 1978).⁷ The women I interviewed were nearly all born around the time television was first introduced in Greece (1966) and have thus grown up with its discursive conventions, not least of which is its "ability to carry a socially convincing sense of the real" (Fiske 1987:21).

The ultrasound scan as performed in the public hospital is a formulaic procedure that resonates with ritual overtones (see Davis-Floyd 1992). The description that follows, based on my repeated observations, is of a typical session, which usually lasts about five minutes. For most women it is replicated several times over the course of their pregnancies, with little variation and in near silence.

Toward the conclusion of the routine prenatal examination the doctor (or the woman) may suggest "putting the baby on television." The woman then follows the doctor down the hospital corridor to a small room, dimly lit by the shadowy gray light emanating from the ultrasound monitor. No other medical personnel are present during the session, but the woman may be accompanied by family members, usually her husband and possibly a small child. The woman lies on the examining bed next to the apparatus and, generally without being instructed to do so (since she has usually done this before), wordlessly pulls her skirt or slacks and underwear down below her abdomen. The doctor squirts her exposed abdomen with a coupling gel and begins to probe its surface with the transducer.

The screen is generally turned toward the doctor. The woman can view it by craning her neck, but her eyes are often directed toward the doctor's face. Quickly and silently the doctor scans the entire fetal image, then focuses on the genital area for a while. At this point he may break his silence to announce "girl" or "boy"unless the woman has already jumped in to tell him she doesn't want to know the sex. (This rarely happened, however.) Or he may tell the woman that the position or age of the fetus doesn't permit him to see the sex this time, and that he will look again next month. Finally, the doctor scans to the skull and freezes the image in order to measure the biparietal diameter (skull width). He checks a chart over the bed upon which the woman is lying and announces the age of the fetus, in weeks and days. If the doctor himself does not tell the woman at this point that "the baby is all right," (no anomaly was ever detected in the 80+ sessions I observed) she will ask him. Most often, this is the only time she speaks. Finally, the doctor wipes the gel from the woman's abdomen with a paper towel and leaves. After pulling up her clothes the woman follows the doctor back to the office. If her husband is with her, as was the case with about one-third of the women, they may exchange a few quick comments in the corridor, usually about the fetus's announced sex.

Fetal Ultrasound and Women's Changing Experiences of Pregnancy

The women I spoke with almost uniformly regarded ultrasound in a positive light. As enthusiastic "consumers" they exerted a strong demand for fetal imaging that was, in part, a product of the machine's status as a metonym for the structural and symbolic superiority of modern medical science and technology. As noted earlier, this was reflected in many women's expressed preference for the hospital because of its "machines."

When women specifically discussed their subjective experiences with ultrasound, several themes repeatedly emerged. Contrary to my expectations, these themes did not vary by social class. First, women depended on the technology to assuage feelings of uncertainty associated with the unpredictability of pregnancy. Although awareness of certain kinds of "risks" to fetal health has been heightened by women's exposure to biomedical discourse, physical and mental disabilities have historically been highly stigmatized in Greek culture (Arnold 1985:257; Blue 1993; Blum and Blum 1965:63; Velogiannis-Moutsopoulos and Bartsocas 1989:230). They are dreaded not only for their direct consequences for the affected individual, but also for the stigma they may bring to the entire family. Since disabilities are often believed to be hereditary, they may affect the marriage prospects of other family members.

Women commonly described feelings of "anxiety" (anhos), "anguish" (agonia), and "nervousness" (trak) just before the scan, which were put to rest once the doctor announced that "the baby is all right." This statement by Maria, a 25-year-old hairdresser, was typical: "I had a lot of anxiety before my first ultrasound, because you can't know what's inside you. Until then, you only see your stomach. After, I felt more sure. You see that all is well." All of the women I spoke with took the doctor's assurance that "the baby is all right" to mean that the fetus was physically integral, or, to use the women's words, that the "baby had its hands and feet," "all its organs," and was "whole" (artimeles, "entirely limbed"). What it could not reveal, the women generally agreed, was how these organs, including the brain, functioned. Despite this widely acknowledged limitation, the ultrasound scan nonetheless provided considerable reassurance of fetal "health" to the great majority of women.

Women also often depended on doctor and machine to mediate their contact with the fetus and to establish its reality. Of especial note was the primacy of visualization over other forms of bodily experience in making the fetus "real," as heard in many women's statements. For instance, Popi, 24, a working-class housewife, said:

I didn't believe I had a baby inside me. When you don't feel it or see it, it's hard to believe, it's something that you can't imagine—how the baby is, how it's growing, how it's moving. . . . After I saw it on the screen, I did believe it. I felt it was more alive in me. . . . I had also seen it [a fetus] on television but it's different to see your own.

And Stavroula, 25, a middle-class housewife, said:

[With ultrasound] you have an idea of what you have inside you. I became conscious that it was a person. I hadn't felt it as much before, I had to see it first. At that moment, you feel that it's yours, the only thing that's yours.

For these women (quite different in terms of their education and class), as for many others, the murky ultrasonographic image furnishes readily recognizable "evidence" of fetal reality. Because the resolution of the image produced by the hospital's scanner is rather poor, women appear to actively interpret fetal images according to the codes of objectivity and realism that underwrite modern visual technologies (television, videos, and photography) in general (see Duden 1993; Fiske 1987; Petchesky 1987; Sontag 1989). Furthermore, exposure to television from an early age may have socialized this generation of Greek women (like western European and North American women) to be "relatively flexible readers of images" (Condit 1990:85), and thus prepared them to metaphorize the shadows that appear on the screen into "my baby." The "truthfulness" and authority of the image are further reinforced through the dramatic ability of the camera-like apparatus to compensate for the deficiencies of the human eve—both the doctor's and the woman's (see Crary 1990). In this regard women's use of metaphors of other visualizing machines (television, camera, microscope) to refer to the ultrasound apparatus is revealing. In any case, with ultrasound a new commonsense mode of apprehending the "reality" of the fetus is established and positively valued early in the pregnancy.

Historical change in the sensory experience of this reality was reflected in an exchange that occurred between Stavroula and her mother, who was present at this point in the interview. Stavroula's mother interjected that she had felt what her daughter was describing when she first sensed her baby move inside her. To which Stavroula replied, "You feel it more intensely when you see it." For most women, due to the intensive use of fetal imaging, seeing (or, rather, being shown) the fetus now usually precedes feeling it inside them. Besides this temporal precedence, these women's comments further suggest that doctor- and machine-mediated "seeing" demotes bodily experience to a secondary order of significance.

Yet many women's comments revealed greater complexity and hint at how ultrasonography might work to reconfigure women's senses by giving a tactile quality to the pregnancy through the visualization of what is, without the technology, impossible to see. As in Stavroula's case, many women explained that the fetus is *felt* as more alive, more present, when it's *seen*. The ability of modern visual technologies to impart a material and tactile quality to what is seen, especially if this is something that was previously unseen or hidden, was noted by Walter Benjamin (Taussig 1992:144), and several of the women interviewed seem to be making a similar point. By adding a tactile modality to the visual, the authority of ultrasound to represent fetal reality is further enhanced, particularly early in the pregnancy, when women's sensual apprehensions of the fetus are to a large extent a product of interactions with the machine and the information it creates.

A final theme to emerge from women's descriptions of ultrasonography that I wish to discuss is the strong pleasure that many of them derived from seeing the fetal image. For instance, Katerina, 20, a middle-class housewife, explained, "The first time I saw the baby, I was crazy with happiness. It was a contact with the child. Every time I went to the doctor, I wanted to see the child again." Litsa, a 28-year-old shopkeeper, said, "After my first ultrasound I felt like I did when I saw it after giving birth—that much happiness." And Zambeta, 18, a clerk in a bakery, exclaimed:

I had four ultrasounds and that wasn't enough! When the doctor first suggested it, I couldn't wait to see it. I was so impatient, the minutes-long wait seemed like eons.... I thought it would be like on television, that I would see the little hands, like under a microscope. But I wasn't disappointed: I saw it move, I saw that it was healthy.

The pleasure many women enthusiastically express can be traced to multiple aspects of the scan. There is, first, pleasure in the assurance of fetal health, as Zambeta mentions ("I saw that it was healthy"). Pleasure also derives from television's apparent realism (see Fiske 1987). Thus the ecstatic sensation of contact that Katerina describes is enabled, or at least enhanced, by ultrasonography's ability to reveal fetal movements in "real time." Real-time ultrasonography, like "live" television, imparts a feeling of "nowness" that is symmetrical with the "lived time" of the pregnant woman, and in the process, promotes a sense of immediate contact with the fetus ("I saw it move"). There is also pleasure from the privileged ability to be "all-seeing" and "all-knowing" about the fetus ("you see how it is"). Knowledge of the sex of the fetus further reinforces this ability and appears to be especially valued because the ideal gender composition of families is often quite specific: one boy and one girl.8 Although women share this "spectatorial privilege" (Fiske 1987:25) with the doctors, they move beyond the doctors' terse declarations of fetal age, sex, and "health" and actively appropriate the fetal images for themselves, endowing the fetuses with qualities and attributes that are meaningful to them alone ("you feel that it's yours, the only thing that's yours"; "I felt it was more alive").

Nonetheless, as Foucault (e.g., 1982) has famously cautioned, the connections between pleasure and power, the "positive" forms of power, must not be overlooked: to mediate this visual connection to the fetus, women had to depend on doctor and machine. In the process they exposed themselves to the possibility of the manipulation of their desire, as I discuss below.

Ultrasound and the Doctors

By the early 1990s most Greek obstetricians had an ultrasound scanner in their offices. As Dr. M., a clinical professor of obstetrics in Athens, commented, "Every obstetrician-gynecologist who gets a degree inevitably buys an ultrasound machine, or sends [his patients] to someone who has one. It's like a stethoscope—that's what ultrasound has become for every obstetrician."

As is the case in the United States, ultrasonography is not recognized as a separate specialty in Greece. The scanning technique appears deceptively simple, although in fact, ultrasound is the most operator-dependent of all medical imaging technologies. Greek obstetricians learn to use ultrasound on rotation as part of their basic medical education, but few receive additional training. As Dr. M. went on to lament, "many do ultrasound, but they don't know what they're seeing." (It should be noted that the situation in the United States is not substantially different, prompting a leading ultrasonographer to a similar lament: "One would think that the number of incompetent or poorly trained practitioners would decline [with time]. This has not been the case" [Craig 1990:561].)

Whereas women almost uniformly regarded ultrasound in a positive light, a clear generational divide marked the views of the obstetricians in the public

hospital. Doctors under 40 saw the machine as indispensable, enabling them to practice "modern" obstetrics. To quote Dr. A., in his mid-thirties: "Obstetrics has made great progress in recent years because of fetal ultrasound. It provides information that just could not be gotten by other means... Ultrasound is the single most important diagnostic tool we have." Similar perceptions were held by nearly all younger obstetricians, despite the fact that hospital records revealed little or no change in outcome statistics since the introduction of routine imaging. The sole exception was the cesarean section rate, which had nearly doubled in four years: from 18 percent in 1985 (the year before the scanner was acquired) to 35 percent by the end of the decade.⁹

In contrast to the younger generation of obstetricians, the oldest obstetricians in the hospital were often critical of the ways in which the machine was routinely used. Arguing against what he considered to be a false sense of precision generated by ultrasonography, a senior obstetrician (in his late fifties) flatly asserted that "obstetrics is an art, not a science." Dr. N. criticized what he called the "overuse" of ultrasound and complained that it can "distance the doctor from the patient." Dr. L., another senior obstetrician, expressed annoyance and regret at the loss of value of his physical senses that had occurred as older hands-on methods, such as dating the pregnancy by measuring the height of the uterine fundus, have been completely replaced by ultrasound:

There are few things my hands can't find that the ultrasound can. My hands are my eyes... but patients think it's more modern to use a machine. They themselves wouldn't trust just a manual exam. The doctor needs to show that he's modern too. That is, some will do an exam with a machine just because a woman will trust him more if he does.... Now, machines are used as a way for doctors to advertise themselves.

Dr. L.'s statement suggests something of how obstetricians perceive the role of ultrasound in countering the pervasive mistrust of physicians mentioned above. The last sentence is also significant, and requires some explanation. Throughout Greece, the relatively low salaries paid to ESY doctors are often supplemented by the gratuities given by patients in gratitude for the care they have received. This practice is an integral aspect of the informal culture of the public health care system. Gift giving, which includes flower arrangements, assortments of pastries and chocolates, as well as cash, must be understood within the wider paternalistic ethos that characterizes doctor-patient relationships in Greece (Velogiannis-Moutsopoulos and Bartsocas 1989). It is also necessary to distinguish this practice from the institution of the fakelaki, or "little envelope," which is an extra fee demanded in advance by a doctor to expedite hospital care (Colombotos and Fakiolas 1993). Gift giving is an (often insistent) gesture made post facto by patients and their families to demonstrate appreciation to doctors (and other hospital staff) for their "help." Although individual sums may be fairly modest, cumulatively they do provide some incentive for doctors to be responsive to patient demands, and thus play a role in determining the contours of the Greek health-care delivery system (Colombotas and Fakiolas 1993). For instance, the probability of receiving gratuities after a birth encourages doctors to provide continuity in prenatal care, something that women highly desire and appreciate.

Informal expressions of gratitude may also have played a role in promoting the intensification of fetal scanning in the hospital. I have already noted women's enthusiasm and strong demand for fetal ultrasound. The department's policy *not* to charge for obstetrical scans (in contrast to scans performed in other departments, for which there is a charge) must be placed in this context. As one doctor explained, "If we charged, all the women would leave!" Although a tongue-in-cheek exaggeration, this comment does illustrate the importance attributed to the technology (and its liberal use) in attracting women to the hospital. Even though often overworked, salaried public sector doctors still want "to advertise themselves," that is, attract and keep women, whom they treat as their individual patients, for the extra income they represent. Fetal ultrasound scanning has thus been fitted into the preexisting informal political economy of health care, which it helps reinforce.

Although some critics regard the systemic practice of gift giving as yet another example of the corruption and clientism endemic to Greek society, it is from the clients' perspective also possible to view it as a form of resistance to the "externally imposed depersonalization of relations" (Tsoukalas 1991:14; see also Gourgouris 1992) represented by the ESY, and more generally as a form of resistance to the state and its labyrinthine regulations. By such informal means, Greek women and their families are able to finesse and personalize an ostensibly rigid public bureaucratic structure.

Normalizing Pregnancy: Real-Time Due Dates

[A] man whose eye dominates records through which some sort of connections are established with millions of others may be said to *dominate*. [Latour 1986:29]

In addition to producing the information women want to know—that is, fetal sex and health—each routine scan generates a "precise" dating of the pregnancy in weeks and days. By repeatedly comparing fetal anthropometric measurements taken from the ultrasound image with antenatal growth charts compiled from survey data, the doctor is able to sustain a "constant web of observation around the normal individual" (Armstrong 1983:101). With the aid of this observational web the fetus becomes temporally normalized and new technological rhythms are superimposed on the pregnancy. In the process individual pregnancies are synchronized with what might be called "doctor's time," and a "temporal symmetry" is established in which the rhythms of the pregnancy and the doctor's expectations come to coincide (see Zerubavel 1981, cited in Barley 1988:126–127).¹⁰ This artifactual, produced synchronicity has significant practical implications: if a woman's pregnancy failed to conform to expectations, the result was usually an attempt to induce labor via amniotomy (artificial rupture of the membrane), pitocin, and/or a cesarean section.

The following interaction illustrates more concretely how doctors used the ultrasound machine to produce authoritative dates, and in the process, delegitimize information provided by women. On her first prenatal visit to Dr. Y., a 20-year-old pregnant woman was unable to pinpoint precisely the date of her last menstrual period. The more Dr. Y. probed, the more upset and confused the woman appeared and the more exasperated the doctor became.¹¹ Finally Doctor Y. told her to follow him to the ultrasound room. After looking at the screen briefly, he informed her that the information she had given him was wrong. When she asked him for the

"correct" date of her pregnancy he didn't reply, but rather commented, "Now that you're going to be a mother, you have to pay more attention and be more responsible." To this the young woman said nothing. In this instance, the combined use of ultrasound and growth charts not only enabled Dr. Y. to discredit this woman's knowledge and substitute his own, machine-derived knowledge as authoritative, it also enabled him to reinforce her place in the broader system of patriarchal and hierarchical social relations within which the medical encounter is embedded.

Sometimes women resisted attempts to normalize their pregnancies. During one scanning session all went according to routine until the doctor announced the fetal age: "eight weeks and one day." To this the woman responded forcefully, "Eight weeks and six days—*I know!*" Such resistance was rare, however. To the contrary, the ultrasound machine was usually treated as the ultimate arbiter of due dates. Women, who actively demanded the procedure, were unlikely to challenge dates produced by doctors in interaction with a technology that embodies the authority not only of biomedical science but also of the visual codes for uncovering "reality."¹²

Finally, ultrasound also offered doctors an avenue for resolving diagnostic differences among themselves and for asserting authority and control over the management of patients, as another example illustrates. Based on clinical evidence, a young resident disagreed with the due date assigned by Dr. R., his superior, to a woman now late in her ninth month of pregnancy. Believing the woman to be dangerously overdue, he recommended immediate delivery by cesarean section. Doctor R. responded to the resident's challenge by doing an ultrasound scan, even though Dr. R. himself had instructed the residents that scans late in pregnancy are not useful for purposes of dating.¹³ Dr. R.'s scan confirmed his original, later due date. In a somewhat unusual outcome, the resident was able to prevail (the woman was a family friend), and the subsequent cesarean revealed meconium staining, a sign of fetal distress.

Conclusion

At the most general level the intensive use of fetal ultrasound imaging in the public hospital is another example of the imperative character of medical technology, that is, of the drive to use technology simply because it exists (Fuchs 1968; Koenig 1991; Tymstra 1989). In this case the technological imperative to use, and possibly overuse, ultrasonography is inflected as well by specifically Greek cultural meanings and sociopolitical institutions. These include being "modern" by trusting in science and technology unfettered by oppositional discourses (e.g., no "natural childbirth" movement exists in Greece), coupled with mistrust of physicians, and existence of an informal economy within the public hospital system that creates an incentive for doctors to freely offer scans. In still other respects, I have argued in this article that the intensive use of fetal ultrasound imaging reflects the "pull" of its particular valence: its tendency to produce a straightforward sense of reality and visual pleasure. Above all, this tendency seems to be enabled and reinforced by the ubiquitousness of television and the early socialization of this generation of young Greek women into its conventions. It is possible that a common, early experience with television and its realist representational codes may also account for some of the striking similarities found in the responses of North American, western European, and Greek women to sonographic fetal images (Hyde 1986; Lydon and Dunkel-Schetter 1994; Milne and Rich 1981; Mitchell 1993; Villeneuve et al. 1988; for some differences between Greek and North American women, see Mitchell and Georges 1997), as well as for the lack of notable social-class differences among the women I interviewed.

As I have described it, ultrasound's valence endows the fetal images it generates with the potential to shape the subjective experiences of pregnant women in ways that differ substantially from, say, the printouts of lab results or electronic fetal monitors, which, like most other medical technologies, remain esoteric and opaque to nonexperts. In the Greek context I have described, the apparatus plays a critical role in reconfiguring what can be called "the structure of feeling" of pregnancy, that is, the tangible way women live and experience their pregnancies within a specific technosocial, cultural, and political context (see Probyn 1991; Williams 1961). This reconfiguration has several manifestations. The visually derived pleasures experienced through the display of the fetal image substitute for older, felt ones or conjure a novel merger of visual and tactile sensations. The slower rhythms of nontechnological pregnancy are accelerated, as the emotional milestones (e.g., quickening, learning the sex) are experienced much earlier. Embedded in the prevailing discourse of risk and maternal responsibility, ultrasound also reinforces preexisting anxieties around pregnancy; in most instances it also provides relief by allaying these anxieties. For, as Beeson has observed of prenatal diagnosis generally, just embarking on the process raises questions about the outcome of the pregnancy, despite the fact that "there is a 98–99% chance that no problem will be found in any given pregnancy" (1984:164). Of course, with the birth of a healthy baby, the power of technology and of the medical profession is affirmed (Beeson 1984:177; Hubbard 1990:167).

Although on occasion doctors in the public hospital use ultrasound to silence women (as in the example of Dr. Y.), the apparatus more commonly produces pleasure and knowledge that women actively seek. Although some feminist critics (e.g., Oakley 1984; Rothman 1986) are certainly correct in pointing to the ways in which fetal imaging extends patriarchal medical authority over pregnancy, the strong demand for and enthusiastic reception of fetal imaging by pregnant women also suggests the emergence of a new consciousness, of their transformation into modern pregnant subjects (Duden 1993:107; Petchesky 1987).

Doctors, particularly those of the younger generation, also associate the technology with the modern practice of obstetrics. Doctors are aware of the ways in which the knowledge produced by ultrasound is dependent on the technology and its inbuilt assumptions, but they too have become "encircled" by the authority of technoscience (Strong 1984). Even though some doctors lament its distancing effects, the loss of value of their own embodied knowledge, and the false sense of precision it creates, ultrasound nonetheless has displaced many hands-on clinical techniques. Furthermore, on occasion, and despite full awareness of its limitations, doctors use the apparatus to achieve such nonmedical ends as bolstering existing authoritative relations with junior doctors and exerting control over the management of pregnant women.

Similarly, even as women actively and enthusiastically demand it, ultrasound provides a context for performing and reinforcing medical authority and, in doing so helps consolidate a growing, but still recent and not yet complete, medical hegemony over women's reproductive experiences.

Notes

Acknowledgments. Research was funded by the American Council of Learned Societies, the Landes-RISM Foundation, and Rice University Faculty Research Awards. I am very grateful to these institutions for making this project possible. I also wish to thank Deanna Trakas and the Institute for Child Health for initial assistance in Athens and in the public hospital, and for their continuing support. For their helpful suggestions at various stages of the writing I thank James Faubion, Michael Herzfeld, Dimitra Gefou-Madianou, Ann Millard, Eleni Papagaroufali, Deanna Trakas, Lida Triantafillidou, and the three anonymous *MAQ* reviewers. For meticulous copyediting I thank Norman Fineman. I am deeply grateful to Robbie Davis-Floyd for her encouragement and suggestions.

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1. For North America see Lydon and Dunkel-Schetter 1994, Milne and Rich 1981, Mitchell 1993, Rapp 1990, and Villeneuve et al. 1988. For western Europe see Fellous 1990 and Hyde 1986.

2. The rapid diffusion and intensive adoption of obstetrical ultrasound has occurred despite important controversies. Although certain serious conditions—for example, abnormal placement of the placenta—can only be diagnosed with ultrasound, its routine use as a screening tool has not been found to improve patient care and fetal outcomes for most women (Craig 1990:552; Ewigman et al. 1993). Additionally, although no short-term adverse effects on the health of infant or mother have been detected, the question of ultrasound's long-term safety remains unresolved (Oakley 1993; Shearer 1984).

3. "Class" designation was based largely on the woman's level of education and, where applicable, her occupation.

4. These figures are based on my analysis of Bréart et al.'s (1992) data.

5. Bathing in the sea was considered risky for either of two reasons. A long-standing concern is that cold currents can harm the pregnancy and cause a woman to miscarry. Alternatively, the sea is feared as a medium of infection of the fetus.

6. An arresting example of the institutionalization of this usage came from the official stationary of the director of an OB-GYN clinic in another city, which had printed, below the name of the clinic, "Department of Ultrasound-Television."

7. According to a recent European Community survey, on average Greeks watch more hours of television than any other European Community members. An estimated 40 percent of Greek households had VCRs by the end of the 1980s (Zaharopoulos 1991:81).

8. It is a truism that male children are most highly desired in Greece, but no such preference was expressed by the young urban women I interviewed. See also Dubisch (1991:37), who reports a similar preference for balance on the island of Tinos. There was also no evidence of sex-selective abortions in the public hospital. Hospital records revealed roughly unchanged sex ratios at birth before and after the introduction of fetal imaging. In any event, sexing of the fetus occurs relatively late in the pregnancy, and is recognized by most women not to be 100 percent accurate.

9. The relationship between electronic fetal monitoring and increased performance of cesarean sections is well established. See Davis-Floyd 1992:279 for a summary of this research.

10. A dramatic (but cross-culturally not unusual) example of this symmetry was found in a 1983 study of the timing of births in Greece. Studying all births for that year, Tzoumaka-Bakoula (1990:85) found that a disproportionately small number took place on Sundays and between 5:00 p.m. and 8:00 p.m.

11. Arnold reports a similar encounter in her study of childbirth in rural Crete: "The doctor is shouting at the patient, asking her why she can't remember the exact date of the first day of her last period . . . the woman starts to cry" (1985:224–225).

12. Rebecca Sarah (1988:68) has described a similar pattern for the United States.

13. The biparietal diameter, usually the sole measure taken during a scan in the public hospital, is subject to variation from the molding that the fetal head undergoes in the uterus, particularly after the 33rd menstrual week of the pregnancy. Thus after 29 menstrual weeks, biparietal diameter is considered to be accurate ± 2 –3 weeks (DuBose 1990).

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