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ULTRASONIC DISCOURSE - -
CONTESTED MEANINGS OF WOMEN,
PREGNANCY, OBSTETRICS,
AND TECHNOLOGY IN THE NORWEGIAN
ULTRASOUND SCREENING DEBATE

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1. Introduction

This article presents an analysis of an ongoing technology-related controversy concerning the implementation in Norway of ultrasound screening in pregnancy. The focus of this analysis will be the claims invoked by key activists in the debate and the ways those claims relate to gendering processes.

The sociology of scientific knowledge emphasizes the advantages of studying science in periods of controversy (Collins, 1985; Latour, 1987). Once an issue is closed, a 'cover-up' (by convention) seals the social processes of science out of view. Scientists no longer appear to be constructing facts through their social interactions. Instead, facts are presented as having been thrust upon them by Nature. A whole body of theory and methodology has been developed which uses controversies as windows onto the social processes leading to such closure.

This program, including the focus on periods of controversy, has been developed into an approach to the study of technology (Pinch & Bijker, 1987; Woolgar, 1991). This approach was launched first as a methodology for describing the influence of *relevant social groups* on the shaping of technological artifacts. Groups are *relevant* when they attach some meaning to the artifact in question. They constitute *separate* groups when they attach significantly different meanings to the artifact. However, a further qualifier is implied in the analysis: groups are relevant when the different meanings they attach to the artifact are *consequential* for the shaping of that artifact.

The concept of *interpretive flexibility* refers to the point that groups attach different meanings to a technological artifact. If the design of an artifact is disputed, and if more than one group engaged in the dispute is consequential, then the artifact will be *unstable*. Artifacts stabilize when enough relevant groups come to see one proposed form of the artifact as appropriate to their respective interests. As with the closure of scientific controversies, previous instability and flexibility tends to disappear from accounts of the artifact from then on. Thus, both the general phenomenon of interpretive flexibility and the potential social and material impact of the meanings disputed in an individual case are most accessible to study in periods of controversy.

To study such controversies, we need to apply a broad definition of technology. We must see the technology, the object of the controversy in question, as a set of relations between an artifact and its surrounding actors, assumptions, and practices -- not simply as a technical artifact. The concept of

socio-technical ensemble (Law & Bijker, 1992) fills that need. Other concepts more or less synonymous with "ensemble" are those of *actor networks* (Latour, op.cit.) (especially local or micro-level networks (Sørensen, 1994)), *hybrids* (Latour, 1991), or *cyborgs* (Haraway, 1991). The ensemble and network concepts focus on the technological artifact and include its surrounding human actors, meanings, institutions, and technical linkages. Actor Network Theory further elaborates on the process of constructing these ensembles. Key to this process are the roles of *spokespersons* and *delegates*. Spokespersons, whether self-declared or elected, claim to speak on behalf of social groups or natural phenomena: "If you build it, they will come." Of course, such claims put ones credibility on the line. If "it" consistently falls apart, or if "they" never show up, the would-be spokesperson fails in the attempt to construct the proposed ensemble. Delegates are (often technical) network maintenance workers. Rules for participation in the network can be inscribed into technical delegates thus enforcing continued stability.

The hybrid concept is more abstract, dealing with the interconnectedness of technology, nature, and culture at a global level. The cyborg concept switches the focus from technical nodes to human nodes in the global socio-technical network. The cyborg metaphor encourages us to note how human practices and identities are formed in close interaction with our surrounding technologies. For instance, if I see myself as staying close to my daughter on another continent (or if she sees me as nagging and interfering) it is due to our relations to the telephone and the computer as much as to one another.

As with the ensemble, the cyborg is a cluster of connected elements, all of which are interpretively flexible. The human node of the cyborg is not so much a spokesperson for the whole as an embodiment and an internalization. As with closed scientific controversies and stabilized technological ensembles, internalized cyborg identities tend to become invisible as such. They come to be seen as biological, psychological, or social inevitabilities. Again it is in periods of controversy that the processes of constructing such identities are most visible.

Perhaps the best example of the tendency to "naturalize" constructed identities is the aspect of gender. Unless challenged, gender identities come to be seen as a matter of genetical fate. One is born with a female or male body, and thereby with a female or male personality, female or male physical and mental abilities, female or male technological affinities. But gender, like technology and like knowledge, is socially constructed.

Gender is constructed along several axes (as a structure of symbols, of relations, of behaviours) and on several planes (as social norms and patterns, and as individual identities and enactments) (Harding, 1986). As with knowledge and technological constructions, gender structures must be constantly maintained -- taught, learned, interpreted, enacted. Thus the

gendering process is in principle accessible for study at any time or place, but its visibility is probably heightened when hegemonic constructs are challenged - when they are confronted with cross-cultural variations, or with gender revolutionary social movements, or with new technologies not yet assigned gender characteristics. Perhaps, as Haraway finds for the gendering of scientific knowledge, sociotechnical ensembles/cyborgs take on their gendered meanings through battles of alternative narratives in a "contested narrative field" (Haraway, 1989). Alternative accounts offered by participants in a controversy are then not merely a window onto the gendering process, but are that process itself being played out before our eyes.

Technologies are implicated in the gendering process both as symbols and as material sites where relations and behaviours are enacted (See for instance: Lie, 1995; Cockburn and Ormrod, 1993). This implies that technologies become gendered, that they take on gender-symbolic value and are delegated positions in the gendered division of labour. Technologies, whether we approach them as cyborg users or as artifact-centred ensembles, are also subjects of a gendering process.

Discourse on the gendering of science has dealt with science in terms of its oppression and marginalization of women (Tuana, 1989; Zuckerman et al, 1991; Fox, 1995) and with gender bias as a form of perversion of scientific ideals (Keller, 1983 & 1995; Bleier, 1986). With respect to technology there has been a similar dual focus on technologies as instruments of oppression and marginalization (Cockburn, 1985; Game and Pringle, 1984) and on gender as a shaping force (Sørensen, 1992; Cockburn and Ormrod, 1993). Thus, the gendering process may be assumed to be important, but it is an open matter *how* it will be important.

The ensemble or cyborg concepts allow us to study technology-related controversies without a priori determining what elements of the ensemble/cyborg are likely to be affected, to what extent, or in what manner. All the elements are interpretively flexible. Any element may be stabilized or destabilized in the course of the controversy. Any element may turn out to be a previously stabilized point against which leverage can rest in order to move other elements.

The ultrasound controversy exemplifies a situation where gendering may turn out to be multi-dimensional and interdependent, in that knowledges, identities, and socio-technical configurations are all affected. In this article, I will not focus on the ultrasound imaging apparatus as an emerging artifact, but rather on the practice of routinely examining all pregnant women with ultrasound one or more times per pregnancy (antenatal ultrasound screening, or simply 'ultrasound screening'). Ultrasound screening is a socio-technological ensemble which is still under development. It is a technological practice aimed at establishing gestational age and identifying multiple pregnancies (twins etc.)

and asymptomatic abnormalities in fetal development or position (Ewigman et al, 1993). The practice is dependent on whether or not ultrasound apparatuses "work," i.e. whether or not they can serve to identify target conditions correctly without harming mother or fetus. But the workability of such an apparatus is not so much a technical problem as a problem of the interface between that apparatus and the bodies it aims to describe. For the apparatus to work, the bodies must work for it: The maternal abdomen must be transparent to it. The fetal body must follow a predictable and morphologically recognizable developmental course. Certain 'facts' about these bodies must come to be seen as self-evident.

And even then a workable apparatus is only a necessary, not a sufficient condition for a workable screening practice. Other equally necessary conditions are catchment routines which refer pregnant women to the screening service; a distribution of apparatuses and a division of labour (i.e. Is screening to be conducted by primary antenatal care providers or by specialized clinics? by physicians, midwives, or radiology technicians? And how are providers to be trained?); follow-up routines (i.e. What happens when a problem is diagnosed?). The practice must find its place in a financial structure. It must (assuming attendance is voluntary) be accepted by the pregnant population.

This article is a partial analysis of the claims made by activists in the Norwegian ultrasound screening debate. In arguing for or against ultrasound screening, these activists make claims as to the capabilities of the technology, the nature of pregnancy, the interests of the pregnant population, etc. In other words, they participate in the construction of the ultrasound screening ensemble, the cyborg fetus, the cyborg woman, etc. They do so by taking on the roles of spokespersons for a number of groups and phenomena. Each of these groups and phenomena under dispute could become the focus of a separate analysis, with the remaining elements appearing in contextual roles. In this article, the focus will be on the contested meanings of gender in relation to providers and users of ultrasound screening in pregnancy.

2. Windows onto ensemble-construction sites

Even during a period of controversy concerning a technology, key actors may attempt to put up barriers to participation in the controversy, limiting access to the construction site to "authorized personnel only." But much like building companies cutting holes in building site fences to allow the public a limited (and preferably admirable) view of ongoing construction, official participants in technology controversies allow limited public viewing access to the ongoing construction process through public statements, media appearances, interviews, etc. By opening windows onto the positions they are constructing in the debate,

they too seek public approval and support. As researchers into social construction processes, we make use of such windows and attempt to cut them larger, allowing a more thorough view of the site or even direct access to the site for excluded groups. To do so, we need to know *when* there has been controversy concerning the technology and *where* we can conveniently access the claims in that controversy.

In the case of ultrasound screening in pregnancy, controversy is still ongoing. Experimental evidence as to whether or not ultrasound screening is beneficial is still debated in the medical journal literature, with conclusions about evenly divided (Sætnan, forthcoming). But the controversy is not confined to arenas of discourse within the medical science community. On the basis of available scientific evidence, a parliamentary White Paper on perinatal care recommended against offering ultrasound screening (NOU 1984:17). This recommendation was hotly contested -- in hearing responses,¹ at professional meetings,² and in mass media.³ In response to this debate, a consensus conference was arranged.⁴ The consensus panel concluded that while there was no evidence that ultrasound screening was beneficial, its implementation was already *fait accompli* and that a policy of regulating this practice was more likely to be effective than an attempt to halt it. The debate received a good deal of attention in Norwegian mass media around the time of the consensus conference, then faded from view. Media attention flared up again in connection with Parliamentary debate over new biotechnology regulations which contain a proposal to suspend ultrasound screening (Ot. prp. nr. 37 (1993-94)). The measure is still under discussion at cabinet and parliamentary level. Ultrasound screening has nonetheless remained standard practice in Norwegian prenatal care since at least 1986.

In any overview of the ongoing debate, certain names stand out as activists. These names recur in prominent positions in arena after arena. They are authors of experimental reports, or members of the White Paper committee, or of the consensus conference planning committee, or the consensus panel. They are consultants to regulating agencies, coordinators of international conferences, authors of letters and articles in professional and mass media. They appear in radio and television debates; they are officers of key professional associations. These actors form the obvious core around which to roll up a "snowball" of actors in the ultrasound screening network.

In this article I analyze the accounts presented in my interviews with seven of the most central actors in that core. The seven are presented in four sets, grouped on the basis of similarity of their accounts and close collaboration in their activities in the controversy. The actors and groups are presented below. I have used pseudonyms in this article, not so much to preserve the actors' anonymity (prominent as they are in the debate, they are all readily identifiable to anyone who cares to make the effort) as because their personal

identities do not concern us here. Rather, we are interested in the positions they represent in the debate. By using pseudonyms descriptive of these positions, I hope to make my own interpretation of the controversy more apparent to the reader.

The Leading Expert (Dr. A) is head of a national laboratory for ultrasound diagnostics and fetal medicine. This laboratory is one of two national centres for obstetric ultrasound diagnostics which has become an obligatory passage point for professional training in ultrasound techniques, confirmational diagnosis of suspected fetal anomalies, treatment of diagnosed anomalies, consultancy on the formation of regulatory legislation, and development of new ultrasound machines and applications. Dr A. headed the first randomized controlled clinical trial claimed to have shown a health benefit from ultrasound screening. Others of his works are standard references for methods of estimating fetal bloodflow, fetal weight and gestational age with ultrasound. He organized an international state-of-the-art conference on obstetric ultrasound in Ålesund, Norway (1983) which is thought to have been a turning-point in overcoming resistance to the implementation of ultrasound screening. Dr. A appeared as an expert witness at the consensus conference, and was a key consultant to the Directorate of Health Services in working out regulatory details following the recommendations of the consensus panel. Dr. A is also a frequent participant in media debates over ultrasound screening and a figurehead for numerous newspaper feature articles on fetal medicine breakthroughs, etc. He is seen by many as the driving force behind the implementation of ultrasound screening in Norwegian antenatal care.

The Midwife was, at the time of the interview and at the times referred to in the interview, head of the Norwegian Association of Midwives. She was a member of the committee which wrote a parliamentary White Paper on perinatal care and of the consensus conference panel on ultrasound in pregnancy. She was also a frequent participant in radio and television debates and contributor to newspaper feature issues.

The two *Sceptical Specialists* are the "Grand Old Man" of Norwegian gynaecology (*The Gynaecologist, or Dr G*) and an international expert on perinatal epidemiology (*The Epidemiologist, or Dr E*). Both have conducted early research projects on ultrasound screening. The Epidemiologist lead the Trondheim randomized controlled trial, a particularly well-renowned trial which concluded that no benefits from screening had been found. The Gynaecologist conducted some of the earliest Norwegian experiments with obstetric ultrasound and reached results which shed doubt on the inter-operator reliability of ultrasound measurements of the fetus. Both were central figures in the White Paper committee. Both appeared as expert witnesses at the consensus conference, for which the Epidemiologist was also a member of the planning committee.

The three *Feminist Doctors* are all specialists in community medicine. All three have both academic, clinical, and administrative careers, and all are active in a larger group of feminist doctors which holds regular meetings and seminars. Their "names" in this article will refer to some feature of their careers or roles in the controversy which differentiates them from one another. They are:

Dr. C (for *The Columnist*), who is an associate professor of general medicine,⁵ and a medical columnist in a women's magazine. Her first formal involvement with the ultrasound screening question was as a member of a sub-committee for the White Paper on perinatal care. She was also a panel member for the Norwegian consensus conference.

Dr. R (for *The Reviewer*) is also an associate professor of general medicine. She became involved in the controversy when a hospital in her community sent out a memo that all pregnant women were to be sent for two routine ultrasound exams. She and a colleague searched the literature and found no evidence of benefit from the procedure. They challenged the hospital CMO to document the basis for the new policy, and as a result the screening program was reduced to one examination per pregnancy. Dr. R has continued to use critical literature review as her main tool for participation in the controversy, publishing mainly in the form of letters to medical journals and to newspapers.

Dr. P (for *The Community Practitioner*) had a similar experience which was triggered by a women's organization in her practice requesting annual clinical examinations for breast cancer. She searched the literature on screening programs in general in order to set up a scientifically grounded screening program and found that screening was rarely worthwhile at all. As with Dr. R, Dr. P was at least partially successful in limiting the community health service's screening activities. She has also been a contributor of correspondence to medical journals, and has served on a number of policy committees and consensus panels (including the panel on ultrasound in pregnancy) on screening and health service priorities issues.

This brief presentation covers just a few of the many arenas in which these seven have sought to influence the implementation of ultrasound screening.

As the case in point was an ongoing controversy, but one in which the "battles" were spread thin in time and space, the most convenient form of data was interviews. In the interviews, I asked each of the informants how they came to be involved in the debate, what their roles in the debate were, how they would explain the success of the technology, and how they thought the debate would unfold in the future.

As with all retrospective interviews, we must assume that the informants' responses are framed to justify their actions and standpoints in the eyes of the interviewer and the interviewer's anticipated audience. The interviews cannot

be taken, statement by statement, as simple accounts of fact. Some statements relate documentable events and chronologies. These I have confirmed, where appropriate, through supplementary documents.

Other statements refer to the informants' own and their opponents' motives, or to the meanings and consequences of actors, actions, and artifacts. These statements do not so much *report about* as actually *constitute instances of* the ascription of meaning to the elements of the ensemble or cyborg(s) which concern us here. The validity of these statements as data is not so much a question of whether they relate objective truths about the meanings and motives they claim to report, as whether they are common or highly particularized instances of their respective sources' polemic claims. Are these claims taylor-made to convince me, or are they claims these same actors have offered to the public in general? Based on comparisons of the accounts offered in the interviews with those presented in public media, I am convinced that the interviews were not tailored for me in particular.

The clearest corroborations of this occurred when Dr. A made three prime time national television appearances in March 1993 -- two in news debate programs and one in a science magazine program. Dr. A's entire presentation in one of the news debates and long sections in the other two can be mapped nearly word for word onto corresponding sections in the (much longer) interview with me. I take this to indicate that the interview was not a special account designed for me as a singular audience, but a more complete presentation of claims directed, whether via television or through me, at a large general audience. I have also heard and read many versions of each of the other informants' accounts -- all compatible with the interview versions, though usually more limited in the scope of issues addressed. I therefore take the interviews to represent a convenient and valid window onto the polemics, if not the actual motives and meanings, of these key actors in the Norwegian ultrasound debate.

3. Screening is a many-gendered thing

3.1. Women, feminists, and techno-fear according to the Leading Expert

Masculinity is unmarked as gender in the configuration of ultrasound screening presented by the Leading Expert. Men are not mentioned as a category or set of attributes. Women, however, do appear in two user roles -- as pregnant mothers and as health professionals (midwives and doctors). Mothers, however, are abstracted almost to the point of invisibility. In a sense the pregnant woman becomes transparent. She becomes only what is inside her: a pregnancy, a diagnosis, twins, etc.⁶ The trouble is, she is not transparent. She is opaque, a

problem for her doctor, a challenge which ultrasound conquers by making her transparent in more than an abstract sense.

The woman's contribution is her compliance in bringing her opaque body to the doctor to be seen through. Only late in the interview do we hear that women actually **want** to be seen through for reasons of their own, that they actively seek and value this procedure because they are **fearful**. Women are fearful that they themselves or the babies they are carrying might be ill. They seek reassurance. Or, if their fears are confirmed, they seek treatment. And when the only "treatment" offered is abortion, they prefer that to carrying the baby to term. And those who don't accept or aren't offered abortion seek information. Although the women in the narrative seek these things, they are nonetheless distressed by them. They need comfort and counselling, which the ultrasound lab therefore also provides.

Briefly, around 1984, women's fearfulness was turned against ultrasound when they were misinformed by journalists that ultrasound might be dangerous. This was successfully countered by exposing doctors and journalists to better information by means of an international conference. Now women are a resource for the ultrasound lab. About 3500 women annually come to the lab for routine scans. They represent a resource for the knowledge the lab gleans from them concerning the attitudes of normal women and the development of normal fetuses. Through experience in routine scanning, the laboratory also gains credibility among the doctors from whom they receive special cases by referral. More directly than the routine-scan women, referred women are a resource base for the lab's national and even international reputation as a centre of skill and expertise. These women also contribute to the development of fetal medicine. Last but not least, screening and referred patients are a rhetorical resource: they are proof that women want ultrasound screening.

The other role in which women appear in this configuration is as health professionals. Here Dr. A does not refer to women as a general category. He does make a few categorical reference to midwives -- a practically all-female profession. But for the most part he refers to particular oppositional women and particular oppositional men. These references to professionals might at first glance seem gender-neutral; but, there are differences between the roles allocated midwives and doctors and differences between the behaviours and motivations attributed to individual men and women which are gendered in traditional ways.

Much of the Dr A's narrative focuses on the organization of ultrasound diagnostics. He has put a lot of effort into his organizational model, in which both routine and selective ultrasound are centralized to laboratories with enough catchment area to hone staff expertise. At these laboratories, routine ultrasound is performed by (specially trained) midwives, selective ultrasound by specialist doctors. As we shall see in *The Midwife's Tale*, some midwives see this as a

professional insult and a threat to their skills; but, in his interview with me, in the tour he gave me of the lab, and in morning meetings at the lab, Dr. A presents this as a form of job enrichment and status elevation for midwives. These midwives have become experts, more skilled in fetal diagnostics than most general practitioners. They serve as "contact midwives," providing information and emotional support for mothers who receive a diagnosis of some fetal abnormality. They do research on diagnosis of abnormalities in a routine scan situation and on normal parameter distributions in a screening population. They are encouraged to publish and to present their research at international conferences.

Dr. A sees this as in midwives' professional interest, and midwives as a natural supporting group for ultrasound screening. But he is also aware that many midwives are of another opinion. At one morning meeting, Dr. A asked the midwives who among them were planning to attend the upcoming annual meeting of the Norwegian Association of Midwives. None were -- ultrasound was not on the program for the meeting, attendance was likely to be boring and possibly even unpleasant (there being considerable opposition to Dr. A's laboratory model). Dr. A urged them to reconsider. A motion on ultrasound training or ultrasound lab organization might come up from the floor. *"We have to be there. We have to be strongly represented there."* In light of opposition to Dr. A's organizational model from midwives' organizations, the job enrichment aspects of the midwife role at Dr. A's lab can be seen as strategic counter-moves.

In the interview, he portrays one oppositional midwife as isolated, but his comment at the morning meeting indicates that he fears she is not so isolated. When it comes to oppositional doctors, he seems much more confident of their isolation. They are few; they are poorly informed about ultrasound diagnostics; they are ineffectual in the discourse: *"They've had no effect whatsoever."* He mentions men and women oppositional doctors in approximately equal (small) numbers, but in gender-different terms. The men are portrayed as representing the establishment. They are powerful and/or old. It is their positional defensiveness, their age, and their lack of vision which misguides them to oppose the young, up-coming, visionary doctors who are introducing the technologies of the future. This is an unfortunate but normal aspect of professional relations.

The women are portrayed as unprofessional, irrational, emotional, perhaps misled by a general fear of technology, perhaps by feminist values which most (normal) women do not share.

3.2. *Oppression and suppression of gender in the Midwife's presentation*

The Midwife's involvement with ultrasound began when she attended one of Dr. A's courses at the laboratory in Trondheim. She came out of the course enthusiastic about ultrasound screening in pregnancy and was responsible for setting up the screening program in her own hospital catchment area. Since then, however, she has become sceptical towards ultrasound. She cites four main sources for her growing scepticism: negative reactions she has received from screened women, the realization that the scientific evidence for screening is weak, the observation that other aspects of natal care are cut back to make room on the budget for ultrasound, and the observation that ultrasound screening programs impinge on midwives' professional autonomy and job content. This last point carries special weight. The Midwife's narrative focuses almost exclusively on reasons for opposing ultrasound screening. Even her explanations for the success of the technology turn quickly to reasons for opposing it, and reasons for opposing it quickly turn to midwives' professional reasons for opposing it. But although all reasons for ultrasound screening quickly turn to reasons against, the final reasons against -- professional interests -- are tenuous and negotiable. If ultrasound screening were organized in such a way that midwives maintained their job content and autonomy, then she is prepared to accept it.

Her portrayal of women as patients is brief. One feature is their relationship with Nature. The Midwife emphasizes pregnancy and childbirth as natural processes which women, with proper support, can generally manage well. Physicians are portrayed as implanting self-doubt in these women, robbing them of their natural capabilities and luring them into a position of dependence. (Midwife: *"Midwives are concerned that if we let technology take over, we'll have let women down. I think what women going through a normal pregnancy need are things primarily midwives can provide."*) By warding off physician interference, midwives allow women's natural state to revive. This image of women's nature complements midwives' (residual) monopoly position in assisting normal pregnancy and delivery, as opposed to physicians' (expanding) monopoly on intervention.

As in the Leading Expert's configuration, fear is another key feature of the pregnant condition. But whereas the Leading Expert promises release from fear as a basis for alliances with women, the Midwife claims women need no release from fear. Their ability to deal with fear in pregnancy is a sign and a source of their strength. It shows, or even makes, them capable of dealing with the various natural outcomes of pregnancy. By "releasing" women (whether by realistic or false promises) from the fear of negative pregnancy outcomes and by "protecting" women from information about the possible outcomes of ultrasound examination, physicians rob women of autonomy and self-reliance,

of the moral strength needed to accept the care of handicapped children, and of the moral legitimacy needed to demand social support in caring for those children. Midwives, on the other hand, would inform women as to what a routine ultrasound exam might reveal, and find women capable of dealing with that information, even to the point of opting not to comply with the offer of a sonogram. Midwives in antenatal care seek a role as counsellors to rather than carers for pregnant women, helping women care for themselves, and defending women from unnecessary physician intervention.

Where Dr. A positions himself as a fetal doctor to whom the pregnant women are secondary, The Midwife places the pregnant woman in the primary client role with fetuses emerging as independent entities only near the end of the midwife:mother relationship. Given this female predominance, given the male predominance among gynaecologists and (to a lesser extent) general practitioners, and given the many feminist histories of professional conflicts between midwives and physicians, it is striking that The Midwife portrays conflicts and congruences of interests between midwives, physicians, and pregnant women in absolutely gender-neutral terms. Midwives are portrayed as taking a protective stand between physicians and normal pregnant patients, but this is based solely on professional skills and values. Only once does The Midwife even hint (through a shift from "them" to "we") that being women themselves, midwives share a special empathy with their pregnant patients: *"I think, though, that women who are pregnant, we always carry a little bit of fear inside us."*

Tensions between midwives and doctors in The Midwife's configuration go beyond their relations to the shared patient group. Midwives are portrayed as threatened by doctors' implementation of new technologies in general and ultrasound screening in particular. Under threat are midwives' autonomy, skills, working conditions and status; offered in compensation are research opportunities and university degrees. But midwives are, the tale claims, already often more competent than gynaecologists, in spite of the latter's degrees and (formal) research qualifications. Physician arrogance, evidenced by their offering midwives special training and degrees in ultrasonography as a "carrot-on-a-stick", is a subject The Midwife describes with intense anger. But here too, she is angered at the insult and oppression dealt one profession by another, not one female profession by a male one. The proposal is seen as an insulting assumption of midwives' motives: *"He was trying, as I see it, to buy us, to tempt us with this prize. And he'd been in touch with the ministry etc. Then I said that 'For us, it's not a question of degrees and careers, the way it is for you. It's a question of preserving the profession of midwifery in the midst of this.' This business of training and 'Now you'll get a degree' and all, that's not what midwives are concerned about."*

It was also seen as an attempt to encroach on the content and autonomy of midwifery: *"Midwives are concerned about integrating this into the profession and not de-skilling the profession."*

And it was seen as an arrogant and unwarranted assumption of superior competence: *"But they've made plans for an ultrasound course that is to take a full year as specialist training for midwives. And then I have to ask 'But what about the doctors?' 'No, doctors ... you'll never get doctors to take a full year.' For them, this is part of their training in gynaecology, where they get a one-week basic course, the same course I had where the one thing I learned was that I hadn't learned enough. So the plan is to demand more of midwives than of doctors, in spite of the doctors being placed in charge of us in terms of responsibility."*

As spokesperson for midwives as a group, the midwife warns that they will not simply allow these insults and incursions to take place: *"We can't accept that. (...) Because this is causing considerable frustration among midwives: They sit there and know more than the doctors and then the doctors don't take seriously what the midwives are saying. We're not through with this debate by a long shot."* But all these claims are made on behalf of midwives as a professional group, not a gendered one.

The absence of gender as an aspect of professional conflict in The Midwife's configuration can be seen as an extension of nurse's professional situation and strategies since the interwar period (Melby, 1991) and of the even longer-standing "settlement" between midwives and obstetricians in which midwives have a limited autonomy in the physician-bounded realm of normal pregnancy (Witz, 1992; Hiddinga & Blume, 1992).

3.3. The (ir)relevance of gender in the Sceptical Specialists' configuration

The Sceptical Specialists have both reached their scepticism towards ultrasound screening in pregnancy on the basis of their own research findings. Science, as they see it, speaks against ultrasound screening. The voice of Science, however, has not been strong enough to stop implementation of the technology. The Sceptical Specialists see Dr. A's personality and entrepreneurial efforts as a key to understanding the successful introduction of ultrasound screening in Norway. Dr. A has tied together a number of powerful interests on the basis of his own enthusiasm and rhetorical and clinical skills. But eventually, Science may be joined by other voices and lead to the abandonment of ultrasound screening.

One voice the Sceptical Specialists are surprised not to have heard so far is the collective voice of protesting women, especially as Science erodes away at the authority of ultrasound technology in setting gestational age:

Dr. E: *"Let's say the matter of determining due dates gets more and more fuzzy. I think [Dr. A] et co. are going to have major problems defending themselves in that debate, because they have too weak a documentation of what's so splendid about their method of determining due dates."*

So the Sceptical Specialists await the day women will rise up against the insult of this technology telling women when they got pregnant. As Science demonstrates that the major effect of ultrasound screening is to encourage abortion of malformed fetuses, they also await the day women will rise up in moral outrage. Together, the voices of women and Science might be sufficient to stop the practice of ultrasound screening:

Dr. E: *"So let's say that aspect crumbles and there's not much left of that effect, and they're really left with just the discovery of a few malformations and terminating those pregnancies. Do you think something will happen with public opinion then? Take the women themselves up to the year 2000, who will be facing any consequences of the way one can be left to go on recklessly within obstetrics with that technology. What do you think? Is it conceivable that women's organizations and feminist groups might react more on an ethical-moral basis against that sort of practice? That's the only thing I can see that could stop this."*

Meanwhile, these men are puzzled, even disappointed, that women's voice is not yet audible:

ARS: *"But there are also all those women who want to see an image of the baby?"*

Dr.E: *"Yes, I see that. That's the sort of thing that will maintain it. And I suppose most people won't really have such strong moral scruples against maintaining such a service in order to scrape out one percent of the children. No. Norwegian women have been fairly inactive, that's true, compared with a number of other countries."*

These men do not claim to speak for women. They are waiting and hoping for women to speak for themselves. Their expectation that women some day will do so is based on how they imagine they themselves would feel if someone used an under-documented technology to usurp their self-knowledge. But they have no elaborate strategy for bringing women to speak up. Their only strategy is to continue speaking out in the name of Science.

They do not differentiate between women as the pregnant targets of the technology and women as health professionals. Women health professionals (Dr. E mentions two in particular) are a special case of women in that they have readier access to information about the technology and its failure to pass the tests of Science. They are a special case of health professionals because as women they are potential targets for the technology, or at least empathetically closer to such women, and can better claim to understand how women respond

to the sort of interference in their lives that ultrasound screening represents. But the Sceptical Specialists do not bring up questions of gendered professional power.

3.4. Genders and interests according to the Feminist Doctors

Of the four informant groups, the Feminist Doctors give the most detailed list of the elements configuring the ultrasound screening ensemble. They differentiate between the professional interests of specialists (who only see a pre-selected patient group and thereby get an exaggerated picture of the benefits of a procedure) and general practitioners (who frequently face the problem of convincing healthy people they are well). They add the ultrasound equipment industry to the list of actors involved in speeding up the implementation of screening. They elaborate on the ways the screening program is linked to administrative and regulatory routines such as the service fee system and the second opinion requirement for second-trimester abortions, whereas rules which might have served as deterrents to rapid implementation have been neglected. They see the alliance with mass media as one of Dr. A's tools for what they call the "medical seduction" of both colleagues and patients. Having created a market demand for ultrasound screening through medical seduction, and having financed and legitimated the procedure through links with health service policy and bureaucracy, ultrasound screening gradually becomes an obligatory passage point for medical practitioners.

This all starts, they claim, with a male network of enthusiastic specialists who see the technology as a vehicle for their mutual ambitions. (Dr. C: *"What's going on up there in Trondheim, it's an alliance among the boys, isn't it? We all know that. A mutual alliance between [Dr. A and his CMO] who build each other up and protect each other and have a network."*) Then further practitioners are recruited into the network via a shared male fascination with technology and a shared male distrust of women patients. (Dr. C: *"If one had listened to women a little and to what they say about what working is like late in pregnancy, then maybe one would have got this thing with pre-delivery leave worked out a bit sooner. NOW we have it, but it's many years late. But of course, the boys have been more interested in technology."*) Still more practitioners are recruited through professional seduction (courses and conferences) or prostitution (economic advantages of offering screening). Finally the remainder are forced into the net through defensive medical practice. (Dr. P: *"You might ask me how I feel about sending people to ultrasound examinations when I know how little it counts. I would answer that I don't have the courage to be the one who stands alone with a completely different medical practice than the official recommendations. I wouldn't dare*

take the chance that something might go wrong and that that woman hadn't received the same services as other women get. That would leave me exposed to suits, and I wouldn't put myself in that position.")

Here, male professionalism is not a neutral standard from which female professionalism deviates or is excluded. Instead, gender (both masculinity and femininity) and profession (including specialization) are intersecting processes which create distinctive points of view and styles of practice. Male specialists and female (feminist) generalists form a stark contrast. The male specialist role is characterized by its emphasis on autonomy from and authority over both patients and less specialized practitioners, achieved by discounting patient-dependent information and relying on practitioner-controlled technology. Male networks are competitive and status-oriented. If normal, the male regime is normal in only the statistical sense that it is frequently observable, not in the sense that it is natural or inevitable.

Feminist practitioners form feminist networks, which are egalitarian and mutually growth oriented. Dr. A interprets the Feminist Doctors' activities in the debate as devious, conspiratorial, furtive. The Feminist Doctors see themselves as democratic and objective. If deviant, their network is deviant only in the sense that it represents an underrepresented and oppressed group, or even that minority of the group which is conscious of and consciously opposes their oppression. This minority, however, sees itself as standing on the side of true Nature and true Science and in that sense as representing normality.

One example of the feminist network at work is their response to a newspaper article based on an interview where Dr. A was quoted as saying that not to let all pregnant women have an ultrasound exam would be unethical. (Attributed to Dr A: *"We know today that approximately two percent of all children who are born in this country have some form of developmental aberration. With an ultrasound examination we can discover this aberration and already in the fetal stage implement measures to repair the damage and thereby give the child better life chances after birth."*) The feminist network viewed this as a misrepresentation of the statistics on what percentage of fetal aberrations ultrasound can diagnosed and what percentage of those again which can be successfully treated. They registered a complaint against Dr. A with the Norwegian Medical Association ethics committee. This, they claim, was accomplished in typical feminist network fashion. (Dr. P: *"Then, in true women's fashion, we shared out the tasks."*)

Feminist practitioners deal with their patients in a similarly cooperative, non-hierarchical fashion. They see Dr. A's and other similar experts' view of these women as paternalistic almost to the point of misogyny. According to the feminists, pregnant women in the experts view are unreliable and potentially ill; their every claim (when they last menstruated, when they had intercourse,

how they are feeling) as well as the normality of their condition must be tested and clinically confirmed before it can be accepted. In contrast, the feminists find women to be normally competent and healthy. Women are, however, subject to self-doubt. If this self-doubt is exacerbated by exposure to the doubts of experts, women risk actually losing their self-knowledge, their self-care responsibility -- even their physical health, since screening entails the risk of false positive diagnosis which can lead to overtreatment. Rather than seek autonomy from and authority over patients, feminist doctors encourage (and thereby empower) women to build on (and thereby build up) their own self-knowledge and self-caring skills. They see women patients as reliable sources of information, information which ought to have more impact on individual health care and on health policy, a view practically identical to that of the Midwife's account.

The Feminist Doctors also present a gendered view of science. They claim that paternalistic experts relate differently to their patients in the "before" and "after" phases of the establishment of expertise. "Before," patients are research material. They are in possession of knowledge and skills which the expert seeks to acquire. In this phase, the experts must accept the patients' reliability, must defend it in the scientific community as it constitutes the reliability of the experts' own research data. "After," once the expert has constructed his own scientific knowledge, future patients' reliability is discredited. Paternalist medicine de-skills patients much in the same way capitalist engineering de-skills workers. In contrast, the Feminist Doctors propose a medical science in which the patients' reliability remains constant, regardless of the construction of knowledge in the professional community. True Science, to these feminists, plays a humble, supporting, enabling role in relation to Nature (including Humanity). It seeks to identify with Nature; it does not seek to dominate or modify. It takes a sceptical, evaluative stand with respect to its own creations. Within its own community, it is democratic; cooperative; non-racist, non-sexist, etc.; mutually growth-encouraging.

The Feminist Doctors also give less primacy to Science in the controversy than do The Sceptical Specialists. Whether or not ultrasound screening can be proven to reduce perinatal mortality, The Feminist Doctors see serious ethical challenges facing it -- challenges concerning patient autonomy, the shrinking sphere of what is deemed "normal," and the abortion of "abnormal" fetuses. These challenges are related to their construction of women's ethics as a result of their social situation:

Women's role in the care of others tends to socialize women as the caretakers of certain moral values as well, such as the acceptance of human variation. In presenting women, unwarned, with the choice of aborting malformed fetuses, medicine alters the structural basis for women's moral socialization. Women's personal desire for healthy children and an unburden-

some motherhood comes into conflict with less immediate, society-level values such as respect of and care for the disabled. This leads to the corruption of social values otherwise maintained by women. Were women to organize as a group, they would have the power to resist the pathologization of their normal states, the medicalization of their lives, the discrediting of their knowledge, the corruption of their morals. Their resistance remains rare and fragmented due to the authoritarian and uncritical ways in which medical "expertise" presents itself to them.

4. Rhetorical moves in ensemble descriptions

In the previous section I presented four accounts of ultrasound screening, with an emphasis on their descriptions of women and men, femininity and masculinity. Summing up those descriptions, we might say that each presents an different interpretation of ultrasound screening as an ensemble or cyborg. Dr. A's cyborg is a benevolent one, consisting of ultrasound equipment, compliant mothers, skilled midwives, and expert doctors. Drs. G and E portray a wasteful cyborg consisting of ultrasound equipment, biased doctors, and passive women. To the midwife, the cyborg is a dangerous linkage of ultrasound equipment with powerful doctors, deskilled midwives, and disempowered mothers. To the Feminist Doctors, the ultrasound screening cyborg is a patriarchal construction of ultrasound equipment, technophilic doctors, and women subordinated to (but sometimes also rebellious against) a male medical definition of pregnancy.

This section is an analysis of the four cyborg descriptions as rhetorical moves. What symbolic resources are tapped to form them? What purposes do they serve in the accounts as a whole?

All of the activists in the ultrasound debate take on self-appointed roles as spokespersons -- not only for themselves or for some group with which they identify themselves, but for a number of groups, artifacts, and phenomena. All purport to speak with the voice of Science, for instance. And, with the possible exception of the Sceptical Specialists, all purport to speak on behalf of women.

Sometimes they claim these voices as their own. Elsewhere in their accounts, they position themselves as interpreters of their opponents' voices. When voicing standpoints they align themselves with, they often lend them the authority of Nature, Truth, and Science: things simply are so. Standpoints they distance themselves from are often deconstructed as coloured by greed, or particular social interests, or simple misunderstandings. Portrayals of femininities and masculinities appear in both modes. Thus, each account contains a set of images of good, natural femininity and contrasting images of bad or misguided femininity. In some, femininity is also contrasted with masculinity,

either explicitly or by implication (as when only femininity is marked as gender and masculinity is implied as the default, or normal category).

These claims of gender interests are interwoven with those claimed for the other groups, artifacts, and phenomena spoken for in the discourse. Gender becomes a relevant aspect of professional obstetric practice, of scientific practice, of the distribution of knowledge between body and machine. And vice versa, science, machines, professions become relevant aspects of gender. In each such move, gendering occurs in two ways: masculinity and femininity are (re)constructed by the inclusion of objects, groups, or phenomena; and, objects, etc. are masculinized or feminized by their inclusion in those constructions. As when Dr. C says, "*But of course, the boys have been more interested in technology*" -- masculinity is constructed as technophilic, and technology as masculine. Whether we see this as construction of a cyborg or an ensemble depends merely on the focus of our analysis.

In invoking "women" and "men" as relevant social groups, these activists invoke whole *relevant social controversies*⁷ into the ultrasound issue. Profession is an aspect of gender controversy and vice versa. Abortion has been a feminist issue. Both profession and gender debates are implicated in discourse over the form and role of science in medicine. Gendered characterizations are invoked in connection with every other theme of controversy connected with ultrasound screening -- the science issue, the abortion issue, the issue of division of labour between physicians and midwives, and so on. Referring to the metaphor of the "seamless web" we might say that ultrasound screening is one square of a larger tartan, with several controversies running through it on the warp and gender crossing and re-crossing them on the woof.

But let us for the purposes of this article refrain from following the intersecting paths of these other related controversies. Analytically it is possible to isolate the theme of gender from them and track the ways gender claims are deployed in the construction and deconstruction efforts of the activists in the debate, accounting for linkages with other themes only so far as to note where they occur.

The four accounts presented above differ not so much in which social groups are deemed relevant or in the boundaries delimiting those groups as in the characteristics attributed to them and the consequences of those characteristics with respect to ultrasound screening. For instance, pregnant women are a relevant social group in all four narratives,⁸ but what are their shared traits and how are those traits relevant to ultrasound services? Gender controversy in this case is not a controversy over relevant social groups, but over *relevant social attributes*. In this particular controversy the existence of gender is for the most part assumed, but its meaning is still being (re)negotiated.

In this renegotiation process, however, the activists are not inventing gender "from scratch." There are no new versions of gender being propounded

here. Each account links ultrasound screening with different pre-existing conceptions of masculinity and/or femininity -- conceptions already available from other arenas of gender controversy. In ascribing sets of gendered attributes to relevant social groups, the activists align themselves with positions in the corresponding social controversies.

There is no reason to believe that they calculatingly choose their alignments to maximize their power in the ultrasound controversy. We may safely assume that alignments with oppositional social movements or with hegemonic views on gender are, at least in these cases, a consequence of which truths each actor holds to be self-evident. Nevertheless, the alignments are there and are consequential for the relative success of the respective actors' ensemble-building efforts.

Dr. A's ascriptions of gendered attributes fall readily within hegemonic views on masculinity and femininity.⁹ This makes Dr. A's ensemble-building job that much easier. He does not need to change people's deep-seated views of themselves and each other, something his opponents to a greater or lesser extent would have to do. Men are widely associated with science, medical science, rationality, technical mastery; women with emotionality, caring roles, fear, techno-fear. When Dr. A explains that women need reassurance during pregnancy, that physicians can provide that reassurance through expert diagnostics, that midwives can contribute by providing routine diagnostics and emotional support -- he can expect most people to simply nod and accept the arguments.

His opponents have more of an uphill battle. When the Midwife portrays fear as a source of feminine strength, when both she and the Feminist Doctors portray lay pregnant women as at least as expert on the state of their bodies as (predominantly male) specialist physicians, when the Sceptical Specialists state the expectation that women will react against ultrasound screening on the basis of the scientific evidence -- the general response is not likely to be a simple nod. More likely a thoughtful and somewhat sceptical tilt of the head. These claims are not outrageously far-fetched, but neither are they commonly assumed knowledge -- at least, not as of now.

This difference in the breadth of the acceptance base for the four accounts is due not so much to the respective terms they associate with gender as to the *meanings* they ascribe to those terms and the *values* they ascribe to those meanings. Nature and Body are both commonly associated with femininity, but they are not commonly taken to imply knowledge or power. Gender-neutrality is commonly associated with professionalism and science; but this does not commonly imply that women have equal access to or authority within such fields. Both Dr. A and the Feminist Doctors associate women's aversion to technology with aversion to ultrasound screening. Dr. A portrays this as a flaw, a failure to recognize the objective interests of women --

feminism gone awry. The Feminist Doctors portray it as a sound scepticism, competent technology critique -- feminism at its best.

As alternative constructions of gender -- alternative, that is, to the current hegemonic position -- the three oppositional narratives do not represent alternative sets of gender-associated attributes. Rather, they represent alternative meanings ascribed to attributes found among the hegemonic set, or alternative values ascribed to meanings already available within the hegemonic set. Pivoting on ambivalences and contradictions within the hegemonic construction of gender, they contribute to its destabilization and aim towards its restabilization at some new point. For some, the destabilization of, for instance, pregnant women as cyborg is incidental to the main project of destabilization of the ultrasound screening ensemble. For others the reverse is true: gender is the main project and any constituent technological ensembles are incidentals. For all positions, oppositional or otherwise, the construction of gender and of ultrasound screening are simultaneous and interdependent processes. At all levels -- as institutionalized practices, as social groups, as sets of attributes, and as sets of meanings -- the socio-technical ensemble and its constituent relevant cyborg groups (or vice versa, whichever view you prefer) are stabilized, destabilized, and restabilized together.

Though most apparent in a state of controversy, this would also be true if the dominant narrative reigned unopposed. Dr. A's narrative also contributes to some marginal change in the construction of gender. Like a builder in concrete using steel reinforcement, Dr. A builds his ultrasound construction on widely accepted views of gender. Probably inadvertently, though clearly to the advantage of the ultrasound structure, he thereby ingrains those views of gender marginally deeper, making both the ensemble and cyborg constructions marginally more stable at their current positions. At least in the short term, constructions based on hegemonic interpretations are more likely to be proposed and more likely to succeed. No calculation or conspiracy on the part of successful entrepreneurs is implied. But neither is long-term success guaranteed. However apparently stable, and however much they contribute to their own further stabilization, constructions this complex contain ambivalences and contradictions which carry a potential for destabilization.

5. Notes

1. White Papers in Norway are circulated to relevant organizations to solicit their responses, which are submitted to Parliament along with the White Paper. In a letter to the Norwegian Medical Association, dated Nov. 19, 1984 and subject marked as pertaining to the NOU 1984:17 hearing, the chairman of the Norwegian Gynecological Association writes that "Ultrasound examination of pregnant women is an excellent tool which has come to stay and to be further developed. (...) Ultrasound screening of all pregnant women will probably soon become routine and take a natural place in prenatal care." In a letter to the Norwegian Gynecological Association, dated Nov. 8, 1994, the association's appointed hearing committee on NOU 1984:17 claims that "Much of the information which has come forth regarding routine ultrasound examination of pregnant women indicates that such a procedure gives clear medical benefits."
2. An influential international conference was organized in connection with the Norwegian ultrasound association's annual meeting in 1984 in Ålesund. The organizer of the conference described the background for this as follows in an interview with me in 1991: "And then came NOU 1984:17, which contained very little about ultrasound. And I thought that here I studied in Germany in Nineteen hundred and way back and in 68-69 we medical students were informed about ultrasound before so much as an apparatus had come to Norway. Now it was nineteen-eighty-FOUR [informant's own emphasis], and these Norwegian academics manage to say so little about ultrasound -- in 1984! So somehow or other we had to get Norway to catch up. And then it occurred to me that the way to do it would be to arrange a conference where top international expertise would lecture for Norwegian gynecologists and tell them what ultrasound diagnostics is good for, what kind of potential it has for the future."
3. The organizer of the above-mentioned conference also offers another reason for the arrangement: "The other reason was that in the Spring of 1984 there was some noise in the newspapers about ultrasound and safety which had scared up some of the pregnant women. And it was known that I was doing a lot with ultrasound, and it was known where I worked, so there were a lot of pregnant women from all over the country who phoned me and asked me personally and expressed their anxiety because they had had an ultrasound exam."
4. Consensus conferences are a forum developed by the National Institutes of Health, Office of Medical Applications of Research (USA) to offer science-based advice on health policy and medical practice. The consensus conference model borrows elements from jury trials, scientific meeting, and town meetings or public hearings. As practiced in Norway, subjects for conferences are chosen on the basis that they are contested and that there is available empirical evidence on which to base recommendations. A preparatory committee is then appointed which in turn selects a panel of experts and lay members, prepares a set of questions for the panel to address, provides the panel with relevant scientific literature, and invites a set of expert witnesses. The conference lasts three days. During the first two days, the witnesses present papers and are questioned by the panel. The public is invited to ask questions and offer evidence at the end of the second day. Then the panel works through the night formulating their answers (the consensus statement) to the questions set by the preparatory committee. The statement is presented at a press conference on the third day. For a description of the history of the NIH model, see Perry and Kalberer (1980) and Jacoby (1985). For a description of variations on the conference model as practiced in various

countries, see McGlynn et al (1990). For the proceedings and consensus statement from the Norwegian consensus conference on ultrasound in pregnancy, see Backe and Buhaug (1986).

5. In Norway that also implies practicing general medicine, often as the head of a group practice.

6. A similar case of "disappearance" has been observed in the testing of the contraceptive pill. In the Puerto Rico trial report, women "disappear" when they are translated into "menstrual cycles." (Oudshoorn, 1992)

7. Special thanks to Knut H. Sørensen for suggesting this phrase to me when discussing the revision of this article.

8. There is such general agreement within our culture as to the definition of pregnancy, that it is not obvious to us that the activists in this debate could potentially disagree on the boundaries of such a group. In fact, in a minor way, they do just that. The three opposing narratives share a different position from that of Dr. A on how best to determine an estimated "due date" and generate the upper bound for "normal pregnancy" (estimated due date +/- two weeks). There is also some disagreement within obstetrics as to whether an ultrasound-based due date estimate establishes gestational age (which implies a date for the onset of pregnancy, the lower bound for inclusion in the group "pregnant women") or anticipated remaining gestation time (implying that pregnancies may vary in length but that their duration is nevertheless predictable from some point onwards). However, as the two current methods for estimating due dates differ on the average only by a day or two, it remains that the four narratives presented here differ far more in terms of characteristics attributed to pregnant women than in delimitation of that group.

9. See Lie (1995) for a discussion of hegemony in a similar context. Important to note here is that hegemony does not imply a dominant, or even necessarily existent, pattern of behaviour. The hegemonic ideal does not imply conformity of behaviour, but does imply the suppression, or de-legitimizing, of other models.

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