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Multiplying Obstetrics

Techniques of Surveillance and Forms of Coordination

Madeleine Akrich and Bernike Pasveer¹

Theoretical Medecine, n°21, pp.63-83.

1. Introduction

In his book Power and the Profession of Obstetrics,² Arney has developed a general model of modern obstetrics, based upon a careful analysis of theories, practices and debates in this discipline. In this model, the notion of 'surveillance' is put center stage. Arney argues that throughout a series of technical innovations like fetal monitoring and ultrasound, the fetus has been constituted as a patient for the obstetrician who henceforth gained authority upon the other actors involved in the process, i.e. midwives and parents. Resulting from this move, the exclusive relationships between woman and midwife, which characterized the traditional organisation of care, have been replaced by a triangular relationship, associating obstetrician, parents and fetus.³

According to Arney, these technical innovations have had other impacts as well. First, they have modified the nature of surveillance. Pregnancy and childbirth are medically redefined as a process which needs continuous surveillance or monitoring. The frontiers between normal and abnormal on which obstetrics has been based, have thus become blurred. Secondly, drawing on a foucauldian analysis, Arney argues that through the objectivation they produce, monitoring techniques function as a sort of panoptique, in which individual and collective work is rendered

¹ Madeleine Akrich is researcher at the Centre de Sociologie de l'Innovation of the Ecole Nationale Supérieure des Mines in Paris. Bernike Pasveer is assistant professor at the Faculty of Arts and Culture of the University Maastricht. We thank our respective and shared colleagues for their constructive and stimulating investments in our work, the editors of this issue, Dick Willems and Rein Vos for their comments on this article, and the people who have provided us with or acted as our 'data' for their contribution.

² Arney, W.R. (1982), Power and the Profession of Obstetrics. Chicago [etc.]: The University of Chicago Press.

³ This evolution has also been denounced by feminist analysts who pointed out that women now cannot do without the mediation of medical professionals to get access to their own body and to their baby, and even that, in some cases, they are negated as individuals whose existence, will, desires exist only as an extension of technical mediations/interventions in their bodies. See for example: Duden, B. (1993), Disembodying Women. Perspectives in Pregnancy and the Unborn. Cambridge & London: Harvard University Press; Ploeg, I. van der (1998), Prosthetic Bodies. Female Embodiment in Reproductive Technologies. Maastricht: Ph.D.Thesis.

visible for the professionals themselves. Surveillance and control do not only concern the baby-to-be and its mother, but are also exerted over professionals: they too require and impose a new form of discipline amongst them which puts them under the gaze of non-professionals, parents, lawyers and prosecutors. Obstetricians' apparent autonomy and authority are thus challenged by the very settings they emerged from.

On numerous aspects, Arney's analysis is convincing and appropriate. More or less implicit, however, is the idea that the trend of increasing surveillance of those who take part in modern obstetrics, is in a way inescapable - that this is modern obstetrics. Moreover, in Arney's version of modern obstetrics, the role of the technologies that produce this regime of surveillance, is quite ambiguous. 'Monitoring' is both a technical device used intermittently during pregnancy and continuously during birth, and an obstetrical 'paradigm' which defines medical practices as well as relations between various actors. Without monitoring devices, the monitoring paradigm would not have developed, as the devices organise and allow for coordination of the actors. However, it remains somewhat unclear what the exact role of the monitoring device in/and the paradigm are. In this paper, we will try to modify Arney's quite static image of modern obstetrics, try to render more detailed the roles of technologies of surveillance, and investigate the emergence of participants to the process of pregnancy and birth. We argue that rather than taking for granted that Obstetrics as a system of knowledge 'influences' or 'is' obstetrical practice, one might try to study the chains of devices, techniques, procedures, through which passages are constituted that may go all the way from obstetrics to Obstetrics, and/or vice versa.

Three questions will be treated in relation to Arney's model of obstetrics: 1) is it adequate to speak of only one model of modern obstetrics? 2) how is the fetus constituted in Dutch practices of 'modern obstetrics', and (how) does its eventual emergence modify relationships between parents and professionals? 3) how might we understand the role and place of monitoring technologies in obstetrics?

In a first part we will focus on the general organisation of Dutch and French obstetrics.⁴ Drawing upon an analysis of recent controversies, we will show that while 'surveillance' can indeed be used to characterize both systems, practical solutions adopted to ensure this surveillance differ widely from one country to another, but also between practices within one obstetrical system. These different

⁴ We draw upon data gathered for a comparative study of Dutch and French obstetrics. See Akrich, M. & Pasveer, B. (1996), Comment la Naissance Vient Aux Femmes. Paris: Les Empêcheurs du Penser en Rond.

scales of differences produce quite a variation of ways of defining pregnancy, birth, and obstetrical work, and they are linked to contrasted ways of attributing competencies and 'power' to initiate or perform activities to the main obstetrical professionals, i.e. midwives and obstetricians.

In a second part, we will concentrate on Dutch practices of attending pregnancy. We argue that whereas they all relate to the general organisation of Dutch obstetrics, they render those who partake in the process and their relations present in rather different ways: fetuses do enter relationships, but not quite or always in the way described by Arney.

This leads to our final argument on the ways technologies of surveillance/monitoring participate in the definition of these settings. We use data of French obstetrics to make our point here.⁵

In concluding, we will return to Arney's obstetrics on the one hand, and to ours on the other. We argue that as obstetrical practices are less static and monolythic than we might think on the basis of Arney's analysis, and that this dynamic allows for interesting experiments within and between obstetrical practices and organizations.

2. Politics of Surveillance

At first glance, French obstetrical practices quite resemble American ones. Nearly all births occur in hospitals or clinics in a highly medicalized and technological environment. Infusion and monitoring are systematically used, while epidural, forceps and vacuum are increasingly present and used in the birthing room. During pregnancy too, medical technologies are rather present. At least three ultrasound examinations are performed and blood sampling takes place almost every month. By contrast, The Netherlands often are perceived as a country in which women can give birth "naturally", that is: according to laws of nature, or simply in a non-technological manner. Of course, this Nature is a highly civilized and reconstructed one. Still, some 54% of all births occur under the exclusive surveillance of a midwife⁶ who can use only very few instruments. About two third of these "non-medicalised"

⁵ We 'play' with the national origins of our data as we have come to realize that 'country' as the unit of analysis is not self-evident. Without wanting to suggest that 'Dutch' and 'French' obstetrics are similar, we'd like to open up the possibility of finding associations along other lines than geographical ones.

⁶ Some 8 % of all births are surveilled by general practitioners. Source: *Obstetrics in the Netherlands, Trends 1989-1993*. Utrecht: SIG Care Information.

births take place at home. The remaining third take place with the midwife in a hospital, the woman leaving the hospital within some 24 hours after her arrival.⁷ Performance measured in terms of fetal and maternal morbidity and mortality are comparable in the two countries, and even a bit in favor of the Netherlands.⁸

Recently, there has been a massive governmental effort to try to reorganize French perinatal care. At the beginning of the 1990s, the government asked a commission (Haut Comité à la Santé Publique) to prepare a report and to make propositions in order to improve the quality and safety of childbirth. This report had been prepared by a series of epidemiological surveys. It leads to the conclusion that French obstetrical performances are poorer than was usually thought and than in other European countries. One of these surveys described cases of maternal deaths and concluded that in two cases out of three, death had been avoidable and that it was caused by a delay in the diagnostic process, or by a delay in the realization of proper treatment. For the experts, the relatively high percentage of avoidable deaths could be explained by the exceptional character of the pathologies manifested, which implied a high chance of meeting with poorly expertised practitioners. In practice, this argument was reinforced by the fact that midwives are often the only ones in charge of the diagnosis (for in some maternities the obstetrician is not present 24 hours a day).

The committee drew a parallel between this result and the description of human and technical resources in obstetric wards. They concluded that human and technical resources were lacking in most maternities, in particular in small ones. They thus make safety appear as a quality attributed to places which are then characterised by the amount of resources that can be drawn upon. According to this analysis, a woman whose pregnancy has been absolutely normal is not safe if she gives birth in a small maternity, where neonatologists, anesthesists, obstetricians are not present 24 hours a day (even if they can be called from home 24 hours a day, which is always the case). Besides the connectedness of safety and place, the committee also made an argument to relate safety with the size of hospitals or clinics: the bigger a hospital, the better equipped it would be and the more safety it would be able to provide.

The report concluded on the necessity to reduce the number of hospitals, thus allowing for a better allocation of existing resources: in short, it opted for a small

⁷ These are called 'policlinical deliveries'. Policlinics are 'out-patient wards', but a policlinical birth takes place in the normal maternity wards: the responsible professional makes a hospital-based birth either policlinical (midwife) or clinical (obstetrician).

⁸ Haut Comité de la Santé Publique (1994). *La sécurité et la qualité de la grossesse et de la naissance : pour un nouveau plan périnatalité*. Paris : Editions de l'ENSP.

number of large and well equipped hospitals, and for closing down maternities with less than 300 births a year (which represent one sixth of the total number of French maternities). Not surprisingly, people working in these small hospitals did not agree. Their argument⁹ denounces economic motives underlying medical reasoning, and tries to show that whatever is the problem - economic or medical - closing the small hospitals could never be an appropriate solution. In particular, they contest the report's definition of competencies as framed by the parameters of size and place/resource. They argue that, in case of problems, it is probably safer to be taken in charge within 10-15 minutes by an experienced obstetrician, like the ones who usually run small maternities, than by one of the advanced medical students who ensure the permanent presence of "physicians" in large hospitals. Here, the discussion doesn't concern the evaluation of risks, but the nature of necessary high-level competencies, given the assumption that risks do exist, while their actual occurrence cannot be foreseen.

We will not enter further into the description of controversies here. Instead, we want to point to something that remains unquestioned by every participant to these controversies. The great majority of French obstetricians agree that as 'obstetrics is an emergency speciality, births cannot be scheduled and obstetrical complications even less.'¹⁰Any childbirth is a risk and pathology can occur at any moment in any case; birth 'can be said to be normal only two hours after the delivery.'¹¹ For this reason, safety can only be properly ensured by having all births occur in a place where human and technical resources are available at any time.

Thus, birth is not considered as pathological as such and by definition. Rather, as Arney also points out for the United States, any frontier between normality and pathology is definitely blurred. It is this blurring which subsequently implies a high degree of continuous and medicalized surveillance of all pregnancies and births, for after all, one cannot foretell what will happen and one must thus always be prepared for the worst.

Dutch controversies do not concern the allocation of resources to different places, but the allocation of women to different professionals, and the attribution of power about the decisions to be made in this respect. Controversies center around a central

⁹ For example, as expressed in Muszynski, C., Lambert, P. et al. (1994), Les maternités publiques de proximité dans l'organisation des soins aux femmes enceintes. *Dossiers de l'Obstétrique*, 214,, 33-35 ; Ossart, J. (1994). Données et logique économiques d'une maternité type de <300 accouchements menacée de fermeture. *Dossiers de l'Obstétrique*, 223, 12-13.

¹⁰ Nisand, I. (1994). Démédicaliser ou humaniser? *Les dossiers de l'Obstétrique n*, 213, 15.

¹¹ Ibid.

device, the VIL (Verloskundige Indicatie Lijst/List of Obstetrical Indications) which plays a major coordinating role during each woman's pregnancy and each child's birth. This VIL is a list of pathologies and factors that have to be taken into account while surveilling pregnancy and birth. Some of these may pre-exist pregnancy (diabetes, psychological problems etc.). Others are linked to a woman's obstetrical past (previous caesarian section for example). Still others may present themselves during pregnancy or birth (aenemia, twins, a gestation of more than 42 weeks, fetal distress). Obstetrical indications are grouped into three categories: A, B, C. Women suffering from no pathology or (risk of) A-pathology will be looked after all during pregnancy and birth by midwives working in private practice. They may choose to give birth at home or "poliklinisch". In all cases, they will be accompanied by their midwife and will not meet with other technical devices than a fetal stetoscope, a doppler, a centimeter, scissors to make an episiotomy if necessary.¹² No apparatus is present that guarantees a continuous registration of the process. The surveillance of women with a (risk of) C-pathology will necessarily be ensured in hospitals, by obstetricians, and birth will occur in conditions similar to hospital births in other western countries.¹³ A (risk of) B-pathology (suspicion of twins, of retarded fetal growth, uncertainly of the gestation period, high blood pressure) require that the surveilling midwife refers the woman and/or her dossier to an obstetrician or another specialist in order to get a second opinion or a precise diagnosis. Formally, the midwife then decides about the further allocation of the surveillance of her client: with her, or with the obstetrician.

Dutch controversies often draw upon the VIL. Some of them concern the classification of a factor or a pathology. For example, midwives are contesting the fact that being over 35 when pregnant for the first time or being pregnant thanks to IVF, must to be considered C-risks. Some midwives also contest the idea that a risk factor concerning only the delivery, like a previous caesarian section, should affect all pregnancy care. Finally, some controversies concern the allocation of the power of decision-making: must the midwife always decide upon the allocation and further trajectory of a woman with a B-pathology, or should that power be allocated to the

¹² Off late, ultrasound check-ups are moving up the ladder of routine prenatal care. Without having become standard in obstetrical practice, a large and increasing percentage of pregnant women sees the fetus at least once during a 'normal' pregnancy. Where this technology will go, and what it will 'do' to the division of competencies, power and to the frontiers of normal and pathological, is unclear.

¹³ It must be noted that 'expectant' obstetrics - that is: professionals trying to interfere as little as possible or only at the actual presence of pathology rather than preventively - also organizes clinical births. Thus clinical births may resemble those in other western countries but they do not necessarily do so: monitoring, infusion, epidural, episiotomy etc. are no routines; a delivery is named 'clinical' if an obstetrician becomes responsible for the process instead of the midwife.

obstetrician to whom a woman is referred? Obstetricians argue that, as they are the ones who have access to diagnostic instruments, their expertise necessarily encompasses the entire process from collection of clinical and biological evidences to diagnosis and decision about a woman's orientation. Midwives consider that to be in charge of that decision is a necessary condition for the functioning of the Dutch organisation, for their professional identity is partly built upon a definition of their specific competencies to avoid medicalization whenever possible. They assume that to hand over to obstetricians the power to decide would result quite rapidly in transferring a more significant proportion of women to the hospital system of care.

Describing Dutch controversies, a rather different picture emerges than in the French case. Safety results from the realization of a proper correspondance between an individual woman, a kind of surveillance and a specific place and professional at birth. The reasoning is symmetrical: a woman who is not presenting any pathology is supposed to be safer at home than in a medicalized setting, with a midwife than with an obstetrician, whereas a woman presenting a high risk or/ of pathology must not give birth anywhere else than in hospital and with an obstetrician. As we have seen, the woman's orientation is realized through the use of the VIL, which functions as a very powerful coordinating device. The possibility of coordination between midwives and obstetricians relies upon the assumption that it is always possible to draw a (temporal or lasting) line between pathology and physiology. This is not to say that frontiers between normality and pathology are clearcut and defined once and forever. It is assumed that the normal and the pathological and a frontier between them can be separated in practice; this drawing of a frontier is at once 'expected' and experimental, for it is assumed that according to an individual woman's trajectory and body, it performs itself in specific and random manners, times, locations. So rather than having blurred any frontier between the normal and the pathological, a series of events have been defined that may occur, any combination of which might then lead to setting up a frontier and making a singular match between woman, professional, level of care, and location.

The Dutch case thus provides us with quite another 'paradigm of surveillance' than the one described and assumed by Arney to be modern obstetrics. The easy way out of this would of course be to claim that Dutch obstetrics has nothing to do with modern obstetrics as the specifics of the Dutch organisation render its practices old-fashioned - but as most other interested parties we will not take the easy way. The machines characterizing modernity are not absent - rather they are kept at a distance and moved to the fore once other technologies of surveillance have indicated the necessity of their use. The Dutch model insists upon the physiological nature of pregnancy and birth and the necessity to preserve physiology as long as possible: to

use as many parameters as can be imagined to continue framing a birth as 'normal' and separating it from the regime of the pathological. Normality, however, is not organized through the apparatus that have already reconfigured modern obstetrics according to Arney. Practices of surveillance are not aimed at (technological) monitoring in order to control a process which is permanently at high risk. Rather, we see a continuous performance of a frontier between physiology and pathology and a lasting effort to ascertain the normality of the process.

Modern obstetrics is thus certainly not 'one' but more. Its variants cannot be simply characterized by the way they define pregnancy and birth - they need to be specified by their framings and associations, through which one or more definitions of 'normal' pregnancy and birth appear, in which the relevant participants and their powers and competencies are defined and related, and in which various forms and technologies of coordination and surveillance are used and inventively linked. These definitions and associations, moreover, are not completely rigid and fixed in the French case, just as they are not completely random in the Dutch. Rather than arguing about the natures of pregnancy and birth here, we'd like to argue that ways of going about pathology and physiology in each setting frame frontiers, their insides and outsides, and effectuate the presence of those who participate in the process, and their respective characters, roles, associations, forms of coordination and constructions of (dis)continuity.

Before investigating how technologies of surveillance work to render variable and productive the forms, organisations and participants of modern obstetrics as well as the coordination between them, we will now analyse Arney's claim as to the entrance of the fetus as a third relational entity during pregnancy and birth. We want to show that 'modern' obstetrics knows no one fetus but as many fetuses as there are obstetrical practices. The practices we describe are collusive with and performative of modern (Dutch) obstetrics, and their constructions of the fetus as present and relational, or as relatively absent and passive, are therefore informative of the ways obstetrics and its participants can exist.

Fetuses¹⁴

¹⁴ We proceed here on the basis of observations one of us did in some (3) Dutch midwifery practices. Consultations hours of midwives and their clients have been observed, interviews have been done with the midwives concerned, and some (between 3 and 5) of their clients have been interviewed about their experiences. Of course, in any quantitative sense such amounts do not allow for any generalizations about 'dutch obstetrics' - yet their variety alone allows for our claim that practices of obstetrics exist that simultaneously differ from one another and collude with the general organisation of Obstetrics. Moreover, they are productive of that very organisation as well as of the articulation of hopes we might have of moving specific practices elsewhere.

As we have already suggested, a certain variability exists of obstetrical practices - not only between countries but within them as well. Every professional plays with what are assumed to be the general characteristics of the organisation in which s/he partakes. At the same time s/he performs a definition of these general features that allows them to 'work' in practice and that allows practice to 'work' upon general obstetrics. Thus, professionals perform personal yet not subjective, random or idiosyncratic ways of relating a client to obstetrics, of inducing specific definitions and distributions of obstetrical knowledge, of positioning oneself and one's client towards the system of obstetrics within which pregnancy and birth are managed. This variety of 'doing' obstetrics becomes especially clear in the ways midwives or obstetricians manage consultations in prenatal care. We will follow two Dutch midwives in order to understand, in a general sense, how the specifics of their practices perform a kind of obstetrical politics, and to understand how the organisation of a private practice is constitutive of the presence of the participants.

The first midwife has a small solo-practice in the countryside. The consultation room is like a normal office, but with an examination table covered with a white sheet in the corner, and a pair of scales next to the midwife's desk. During each consultation of some 20 minutes, the midwife checks her client's urine, blood pressure, sometimes she checks blood for signs of anaemia, weight, the growth of the belly/uterus with her hands and with a centimeter. Midwife and woman listen to the fetal heart with a doppler. Depending on what the woman says or asks, the midwife gives advice of various kinds. Thus a client's remark that she wants to give birth policlinically¹⁵ because of a water-bed at home, makes the midwife say that an extra matress on top of the waterbed will also be fine, or else they'll put a bed together in another room; another client's complaints about extreme tiredness are met with an examination of a drop of blood and the advice, based on the result, to eat more spinach and dried fruit. If the woman expresses no signs of disorder, and asks no questions, no information of any obstetrical or medical issues is provided by the midwife. Her clients do not get a standard echo in a nearby hospital, for 'healthy women do not belong in hospitals', the midwife holds (interview).

Throughout each consultation this midwife has the habit of chatting on about just anything, including the pregnancy, in a specific manner. Thus during the urine check they chat about the weather, when the doppler makes audible the fetal heartbeat she says something like: 'that sounds fine' and continues about the Gulf war, and then go on about the day before when they had met in the supermarket, measurements of the belly are noted, etc. The effect of this is that the obstetrical

¹⁵ See note 7.

examinations hardly occur as separate activities: they are not lifted out and rendered more special than the Gulf war or the weather. This 'flow' of activities renders that which is of medical/obstetrical importance to the midwife quite 'invisible': it strongly frames the pregnancy as nothin special and certainly not as in need of more special care than is already provided. Its corrolary is supposed to be a feeling of being at ease, of no need to worry, and of complete trust put in the midwife's ability and capacity to notice and communicate disorder. The assumption and the performance is that the woman and her body carry the 'normal', and that the midwife tries to enforce that embodiment unless there are reasons to interrogate others. The midwife deliberately takes care to keep as little explicated as possible what is of obstetrical importance. It appears that in order to constitute this embodiment of pregnancy, normality, trust and Dutch obstetrics itself, this midwife holds that what should not be offered to a woman is explication and visibility of more than the necessary obstetrical parameters of pregnancy. Least of all, one is to endow others (technologies, places, professionals) with the ability to provide important and necessary knowledge about a normal pregnancy.

The midwife does all she has to do according to the VIL, she and her client know all they need to know. Yet when returning to our questions - how is this obstetrical politics, and how does this politics associate (or not) the fetus with the pregnancy? - the obstetrical politics she performs becomes clear. Although the chatting-mode as such of this midwife may be 'personal and subjective', its obstetrical performance is strong on the non-medicalization side of Dutch obstetrics. There is no ignorance with regard to medical technologies and their work: if there are no specific reasons, the 'old' range of examinations the midwife is able to perform and with the use of which she is able to do the work of supervision and selection according to the VIL, is sufficient.

In this modern obstetrical practice, relations exist between midwife and woman: they constitute and partly embody the knowledge and know-how of the pregnancy. The fetus as a third party has an intermittent and non-continuous place in the collective in a specific and rather moderate way. It is more present than years ago, as the midwife now listens with her doppler so that her client can also hear the heart beat. The possibility of rendering the fetus more present, are acknowledged: if, for example, a woman presented a family history of twins, the midwife does not hesitate to have an ultrasound made. Important, however, is that if no such reasons are available, the midwife does not allow the fetus - or any other third party - to enter and modify the relations between midwief and client, client and body.¹⁶ Thus

¹⁶ Elsewhere we argue that the increasing tendency to constitute a woman's knowledge of her pregnancy through a variety of apparatus and people, might influence the wish or competency (of woman and midwife) to give birth without these excorporal sources of information – at home, for

its existence is acknowledged but hardly articulated: its temporal articulations (heartbeat, belly) appear on a par with articulations of other mundane things, such as the weather. It does not, or hardly, become an obstetric agent through which relations between the other participants (midwife, woman, partner) must permanently pass.

The second Dutch practice we observed is run by two midwives who hold consultations hours in different parts of a small city in the south of the country. The consultation room we saw is a gp's office. There is a computer, a desk, a bloodpressure meter, in an adjacent room there is a paper-sheet covered examination table and a pair of scales. We observed the same routines here as in the other practice: checks of urine, blood pressure, weight, measuring the belly with hands and centimeter, the fetal heart with a doppler. All of her clients are sent to hospital at about 12 to 16 weeks of gestation for an ultrasound: 'they want it anyway, so why make a fuzz' (interview). At that same visit to the hospital, they also have a bloodsample take for laboratory tests.

Roughly the same kind of obstetrical data are collected, but this takes place through different kinds of articulations. This midwife hardly chats at all – again this may be a personal characteristic, yet it colludes with the other articulations she makes. Rather than a flow in which little stands out as an 'events',¹⁷ we see here appear a series of connected yet differentiated activities which are events in themselves and which lead to explicit obstetrical articulations. Information of obstetrical importance is explicated by this midwife, it is put in the context and the coherence of her work which is about getting to know this pregnancy and explicating that knowledge to her client. Although the ultrasound itself, and the fact that it is made in hospital are completely coherent with Dutch Obstetrics, this practice performs that Obstetrics differently.

This midwife renders explicit what is done and what comes out, she performs and produces obstetrical articulations: points of interest where time stands still and part of the pregnancy is made visible for a while. A larger collective of participants

example. See Pasveer, B. & Akrich, M. (1998), Hoe lichamen circuleren. *Tijdschrift voor Genderstudies*, 1, 3, 47-55; Pasveer, B. & Akrich, M. (forthcoming), Passages: On Coordination Devices in Dutch and French Obstetrics. In: Vries, Ray de, et.al. (eds), *Birth By Design*.

¹⁷ See Latour, B. (1996), Trains of thoughts, Piaget, Formalism and the Fifth Dimension, *Common Knowledge*, 6, 3, 170-191, for a description of trajectories travelled with the deliberate goal of going smoothly from a to b without any occurrence on the way standing out and lending itself as a memory, something breaking the flow - and trajectories travelled because of the travelling and designed in order to make events, occurrences, objects stand out as markers of the travelling. The first midwife makes for her client a smooth obstetrical trajectory, the second articulates the travelling more explicitly, and organizes memorable obstetrical markers.

and connections is set up here: hospital joins in for an ultrasound and a blood test, and, as we will see shortly, the fetus too is articulated a bit differently. With the ultrasound added, it becomes more of an entity to relate to, both for the woman and in her relation with the midwife. At some consultations, the women had just returned from the ultrasound, and although no images were shown, the event had changed the experience of the pregnancy, it had added the future father as a participant more clearly than before, the women spoke of now knowing for certain that they were pregnant. This knowledge/experience passes through the ultrasound which has made the fetus to enter relationships and probably reconstitute them.

Through ways of talking, performing rituals and examinations, touching bodies, through visualizing the pregnancy or not, through articulating or refraining from doing that, particular positions with regard to institutionalized obstetrics are taken. The first midwife articulates her position with regard to obstetrics by not explicitly relating to her clients through obstetrical parameters – although, of course, they constitute the only reason for her seeing these women regularly, for touching their bodies and looking for specific kinds of information. Nothing else than midwife/instruments and women/body enter her obstetrics. As translations and displacements from body/client to midwife are kept to a ‘modern’ minimum, the road back from knowledge derived from that body/client to that body/client is short, and apparently is in no need of repair or attention.

The second midwife, who too acts in perfect accord with obstetrics as a system, produces clear and explicit obstetrical articulations; in her practice, others than herself and the woman have entered to produce these articulations. The fetus has made its appearance here as a constituent of normality – in the other practice it entered only when abnormality was suspected on clear grounds. More, and more complicated translations are made here from body/client to midwife, they pass through more agents, and it remains a bit unclear whether/how these translations and mediations are fed back into the body/client.

We see that the very existence of the Dutch system of obstetrics shows that ‘modern obstetrics’ need not be solely (in)formed by the structures Arney suggests. Its practices show, moreover, that although both midwives adhere to Obstetrics as a macro-structure, passages from ‘micro’ to ‘macro’ differ and are not indifferent to Obstetrics. Differences in practices are not just expressive of practitioner’s personal and idiosyncratic ways of going about but rather organise relevant relations between Obstetrics. They do so in non-neutral ways. The first midwife is highly convinced of the normality of pregnancy and birth, and strongly against ‘long chains of translation’, against constructing long trajectories with a lot of mediators. Even her ‘personal’ ways of going about – the chatmode – co-produce this politics. The second midwife too holds the assumption of normality, but her politics tends to cohere

more with trends in Obstetrics all along, of explicating, visualizing, translating and articulating more than before, and using some other 'outplaced' apparatus to produce those articulations.

So, in modern obstetrics, in The Netherlands and elsewhere, the pregnancy, its normality, those who constitute its parameters and their relations and articulations, are framed in various ways. This framing takes place through the practical techniques and technologies of surveillance/monitoring, which are at once informed by Obstetrics and constitutive of its practices – and vice versa. Techniques and technologies differ between countries. In France, ultrasound as well as the triple test belong to the standard repertoire of prenatal screening, whereas in The Netherlands the triple test does not, and ultrasounds institutes quite a range of practices. There are similarities too: Dutch as well as French midwives and physicians ask their clients how they feel and whether they feel their baby move. These are interrogations which put emphasis on the fact that the woman is herself part of the 'monitoring'. Yet they leave undetermined the question of who is in charge of the interpretation. As we have seen, the determination thereof is further articulated within rituals of specific practices. Through these specific articulations, professionals propose a certain definition of the relationships between them, the parents, the fetus/baby, and they produce a map of different forms of knowledge and of the ways the participants relate to each other. We have argued that such articulations are productive of 'obstetrical politics', or, less strongly formulated, of the ways through which Obstetrics is a result of obstetrical practices just as much as the other way around.

Monitoring as coordination

Technologies play a central role in Arney's analysis: they transform the way pregnancy and birth are defined, and through objectivation they constitute an obstetrical 'order', drawing upon mutual control of all participants; finally, technologies are amongst the key factors explaining the emergence of a new discipline, understood as both a new form of knowledge and a structure of power. However, as our previous descriptions of prenatal surveillance have suggested, the concept of Obstetrics as something a priori more general than obstetrical practices and as something that can be abstracted and detached from what appear as practical instantiations, seems to be questionable. What appears as 'general' can be described as a long chain of coordination devices and techniques which are held by and hold what they associate.

In this last section we concentrate on the French birth-configuration. We suggest that in France, the technology of electronically monitoring fetal and uterine activity during labour, should indeed be understood as a major device of coordination during births in France. This specific role, which appears as an effect of our stress upon relations rather than principles, practices rather than Obstetrics, produces, we hope, an image of the work of technologies-at-birth that is more complex, as well as a contribution to what we will denote in our conclusions as the possibility of politically relevant experiments in obstetrics. As our account reveals more and different roles for technology of monitoring than Arney's account allows for, it renders invisible the fact that modern obstetrics does not always pass through the technology; therefore we 'footnote' our narrative with comparative remarks about Dutch deliveries.

Let's describe birth as it takes place in a large majority of French maternities. When a woman arrives at the hospital or the clinic, the midwife on duty will check manually and through a short period of electronic monitoring whether the delivery is well underway. If so, the woman will be brought to the 'labour room', where she will soon become 'wired'. An infusion which administers glucose is installed. In case the midwife would decide that the delivery must be accelerated or that contractions must be regulated or enforced, it can be used to administer oxytocine, the hormone causing the contractions. An electronic monitoring device is attached to the woman's belly. It comprises two separated captors: one for measuring the frequency and force of contractions, and the other for recording fetal heartbeat. These two captors are connected to a printer which draws two paper trails out of the succession of these parameters. Sometimes an automatic pressure meter is added. More and more often,¹⁸ the woman will get an epidural for pain relief/suppression.

The monitoring device performs a variety of connected activities. First of all, it acts as a coordinator of the midwife's activities. In larger hospitals, a midwife often has to surveil several births simultaneously. The electronically produced paper trail keeps a memory of the progress of labour and the baby's situation, but it is also used to contain additional handwritten information: the midwife marks its temporal dimension with notes on her interventions (internal examination, installation of epidural, administration of oxytocine, ruptures of the waters, etc.) and their outcomes.

Secondly, the monitor mediates between midwives. Midwives are on duty for 12 or 24 hours, so it occurs rather frequently that a delivery has to be surveiled by

¹⁸ In 1991, about 6 out of 10 births were accompanied by a form of analgesia, including births by caesarian sections. It is likely that this proportion has increased since then. Groupe IMAGE (1997), *L'obstétrique en France, deuxième partie*. Groupe d'Animation et d'Impulsion National, Caisse Nationale d'Assurance Maladie, 145.

two different midwives. The monitoring trails, with the midwife's notes, informs the new midwife about specific data about the birth so far.

Thirdly, the monitoring apparatus carries and translates messages between different kinds of professionals involved (nurses, midwives, obstetricians), it is productive of their specific range of activities, it is the obligatory passage point¹⁹ of many interpretations concerning the delivery in question, and on the distribution of responsibilities that is usually connected to such interpretations. In most public hospitals, midwives are the only persons responsible for the surveillance of normal births. We have argued that French perinatal care is organized around the idea that there is no clear frontier between pathology and normalcy and that therefore any delivery should take place in a medicalized environment in order to be prepared for any eventuality. But this does not mean that each and every actual birth is considered as pathological. The French organisation even produces a demarcation, which can be modified minute per minute, between normal births surveilled by midwives, and pathological births which imply the intervention of an obstetrician. There are numerous reasons that legitimate an obstetrician's intervention: the expulsion takes too long²⁰ and needs instrumental help, dilatation is not progressing, fetal distress, etc. It is interesting to note that fetal distress is often diagnosed through the analysis of the monitor-curve that represents fetal cardiac rhythm. Here the monitor plays exactly the same role as the Dutch VIL: it is the point of reference through which professionals coordinate their activities and informations. A (French, Dutch) midwife knows that when she is faced with specific trails/signs, she has to call for the obstetrician. The corollary of Dutch VIL and French monitoring is a distribution of responsibilities which, if not respected, can lead to professional and legal sanctions. There are, of course, differences as a delivery 'monitored' by the VIL leaves radically different trails and does not render visible most of the French parameters. With the involvement of continuous electronic monitoring, control is thus performed by the very technological device that coordinates the work of the different participants.

Last but not least, monitoring connects the various participants that perform the collective action of giving birth. It is by passing through the device that the participants acquire obstetrical importance, come to contain obstetrical parameters, and are connected. If we try to list the 'human' participants to the birth configuration, we can at least identify four of them- each of them is related to the

¹⁹ Latour, B. (1987), Science in Action. How to follow scientists and engineers through society. Milton Keynes: Open University Press, 150, 182 and 245.

²⁰ According to the French standard expulsion should take maximum half an hour, according to Dutch standard practice expulsion for a first-born can take two, otherwise maximum one hour.

monitoring device, and connections between them that are of obstetrical relevance pass through its trails.²¹ The fetus is continuously present for professionals - but for women too - through the trail of its heartbeats. In a Dutch birth, where this continuous trail is absent as electronic monitoring is only done in cases of suspected trouble, the fetus acquires an intermittent presence when the midwife listens to its heartbeat a few times during labour and more often during expulsion. French women are thus maybe reminded of their baby continuously, whereas Dutch women are not.²²

Next the uterus is present through the trail of its contractions, which are fed with the infusion of glucose and often standardized through the administration of oxytocin. In the French configuration - in which a large majority of women give birth under epidural - the separation of the uterus from the woman is important. The uterus becomes somewhat autonomous as it does not depend anymore on the woman for energy and the supply of hormones, and the woman herself is quite often separated from her uterus as, due to the epidural analgesia, she does not feel much of the contractions. The only knowledge of its work is presented through the monitoring trail to the midwife - and probably to the woman too. We will see that only during the expulsion, this information is of importance to her. In the Dutch configuration, the uterus is present to the midwife only as the woman reports or shows that she is having contractions.

Third participant to the French configuration is the woman, whose body has acquired a particular condition and whose range of competencies is related to the work of the others - notably the monitoring apparatus. The woman is instructed as to how to interpret the green, orange and red lights on the monitoring device, and in case of an orange or red light she is supposed to first modify her position in order to allow for the good functioning of the apparatus. If the light remains red, she must warn a medical person. She is thus actively involved into the medical surveillance, yet the monitoring's message to her is different from the one it sends to obstetrical professionals, both in terms of its content and in terms of the distance it travels. It

²¹ See for an elaboration of this point: Pasveer, B. & Akrich, M. (1996). Hoe kinderen geboren worden. *Kennis en Methode*, 20, 1, 116-145.

²² This connects with the different narratives of birth: in French journals for parents-to-be, as well as in professional obstetrical journals, birth is proclaimed to be an event that is important for the relations between mother and child (le lien mère-enfant); the absence of labour pain as achieved through the epidural is said to contribute to the woman being conscious of this relationship. We would argue that the continuous presence of the fetal heartbeat (through the paper trail and through the sound of the machine that render the heartbeat audible) enforces this consciousness. Dutch women do not 'receive' this consciousness during home-births, and the discourse of relations between mothers-to-be and their future babies as they are constituted during deliveries is practically absent in popular and professional journals.

therefore grants little agency, or power to interpret, to the woman, as even the alarming 'red' is not, in first instance to be read as 'something wrong with the fetus' but as 'change position'. The woman is supposed to be more active during the expulsion of the baby: when under epidural, she does not sense contractions through her body, and, importantly, felt contractions are of less obstetrical importance than recorded contractions.²³ She has to push on command of the midwife - we'll come back to this event shortly.

Last human participant to the normal delivery in France, is the midwife. She comes in every 30-45mn, looks at the monitoring trail, sometimes does an internal, checks the infusion, asks the woman if she feels all right, and writes down on the paper trails what kind of interventions she has done. Whether under epidural or not, the stage of labour passes without the midwife being very present to the woman.²⁴ At the start of the expulsion, however, something interesting happens. The woman does not register the coming, presence and duration of contractions, but the monitor does and in accord with that, the midwife does too. At that point, the midwife warns the woman that she must get ready for pushing - on command of monitor/midwife. No-one can trust the woman to know how long to continue the effort of pushing with a contraction, and her work, as well as that of her body and the activities and the encouragements of the midwife, is coordinated by the monitor alone.²⁵ It is the only 'container' of information about the working of the uterus.

As this description reveals, the electronic monitoring device is indeed a powerful producer of information about the birth and point of coordination between the various participants it simultaneously contributes to individualize. Many of their obstetrically relevant activities are informed by and connected through the monitoring device. Some of the participants, notably the fetus, are even produced by the technology itself. Arney rightly argues that the parents are part of the 'team' as they have to give their baby the best conditions to develop. He also states that within this team a certain division of labour appears: parents are in charge of the psychological aspects of birth - bonding with the baby, thinking about their new

²³ Without epidural, felt contractions are a nuisance both to woman and to midwife; moreover, the monitoring apparatus registers contractions before they are registered by the woman.

²⁴ There is no difference here with the Dutch home delivery: although the midwife partly does different kinds of examinations, her presence becomes permanent and more prominent towards the expulsion.

²⁵ At a Dutch delivery, the woman must announce a contraction and its duration and strength. The midwife is able to infer from visual inspection of the woman, the belly and the perineum, whether she can ask for another push when the woman announces that it is over. Thus the same entities that register a contraction also coordinate its performance.

status as parents, etc. - whereas professionals are in charge of its physiology. This kind of division along the lines of the psychological and the physical is not very convincing: it remains to be seen whether and how embodiments and affections are produced within the collective. We also think that the notion of 'team' has to be taken even more seriously than Arney does and meant to do. In 'modern obstetrics' a collective actor is being created through the functioning of coordination mechanisms. In a majority of hospitals in France, monitoring and surveillance technologies are central in performing such a collective actor in the birth process.

Conclusion

This article started with a picture in which modern obstetrics appears unified through the existence of a regime of knowledge as well as a regime of power structured by the monitoring concept/technology. For Arney, it is clear that a distinction has to be made between obstetrics on one hand, and professionals' practices and women's experiences on the other hand. These are either constituted as a result of Obstetrics, or, one would think, personal and of no obstetrical importance.

In our description, we have tried to show that the performances of systems of Obstetrics, their relations with practices and vice versa, the entities these performances render present and related, and the ways they are connected to experiences, is more complex. They are more complex in interesting and non-random ways, or so we suggest. What allows participants to go from one topos to another: from Obstetrics to practice, from practice to politics, from politics to experience etc., is not self-evidently induced by Obstetrics, but needs to be studied as a surprising range of passages that connect (or don't). The monitoring device can be seen as one of the apparatus that allow or produce such passages: it is a coordinator of movement. Talking of passages and coordination allows one to talk about actors, their activities, and the way they relate to one another, without giving a priori any privilege to any of them, without deciding a priori what is local (practice), and what is global or general (the Concept of Obstetrics). Our description of modern obstetrical practices also allows us to claim that there are more ways and technologies of coordination, to interpret the existence of multiple forms of homogeneity, defined by specific sets of coordination devices, and at the same time to understand the existence of differences. Finally, it allows one to take into account heterogeneous (f)actors: each form of coordination can have its own genesis, its own history, its own way of mixing trails, rather than, as Arney suggests, being the result of some grand and unique cause (Obstetrics).

But our analysis might also allow for more political conclusions or suggestions – it is not a theoretical exercise only. Single causes with single effects allow for little space for manoeuvre: as long as the cause (the concept of obstetrics, the definition of birth as pathological or physiological) remains present, little else can be done to affect the practices of obstetrics. If one insists that the heterogeneity and the variety of elements is always in similar ways associated by coordination devices, then deliberate transformations and evolutions seem rather difficult. If, on the other hand, one insists on the ‘locality’ of causes (be they ‘big’ and produced as it were ‘from above’, or small and produced every instance anew in obstetric consultations), on the fact that there is not one single and monolithic logic explaining the functioning of all of obstetrics, then there appears to be room for significant and politically relevant initiative, for negotiation, for experiment, for diversity within and amongst practices.

Seen in that light, Arney’s description of obstetrics might thus be interpreted as just one trend amongst others, in which professionals’ attitudes also perform a positioning in a space of possibilities. Thus, describing practices in both countries in terms of ‘national’ differences only has little sense, since we have seen practice can vary a lot too within a single country. What remains different is the way these various practices can be interpreted as political statements with regard to the “general” policies of obstetrics which are themselves defined by legal constraints and institutionalized forms of coordination.

If the ways obstetrical practices perform the work of coordination in various non-random yet unsystematic ways, as we have argued, these differences should be treated as relevant rather than idiosyncratic. If they produce importantly different ways of allocating powers to be in charge of interpretations, of experiencing health, ‘life’, disorders, they might be worth studying further and more thoroughly. For it might be here that creative combinations of medical machines and human bodies could be installed, that new passages to go from practice to organisation can be devised, for none of these has its own, essential and fixed characteristics. Rather than having to be ‘against’ or ‘for’ prenatal or antenatal technologies, one might want to consider specific practices of surveillance as the sites of interesting experiments directed at new definitions of Obstetrics: of pregnancy, birth, safety and risk, power and experience. And so, by having made relevant much of what tends to be interpreted as random and subjective variance, our analysis too is meant to be political: we deliberately wish to encourage experiments and variation.