

Human Birth: Evolutionary and Crosscultural Perspectives

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Resumé:

Porod, zvláště u lidí, je velice komplikovaný proces podobný všem jiným podstatným událostem v životě organismu přímo ovlivňujícím existenci a dobrý stav potomků. Z hlediska evoluční biologie jsme my lidé stejně tak perfektními produkty jako jiní živočichové, velice dobře vyhavenými pro všechny události, které nám život přináší. Paradigma defektního lidského živočicha však pořád zůstává základem mnoha vědních oborů o člověku, a to má samozřejmě vliv na myšlení v medicíně obecně. Studenti medicíny a lékaři jsou trénováni z hlediska konceptu, že lidské tělo je nedokonalé. Denně vidí pacienty u kterých něco funguje špatně a je velice těžké pro ně chápat lidský organizmus jako zázrak evoluce. To je překážka, proti které chci v tomto článku uvést některé ze svých myšlenek a něco z naší práce.

Introduction

Birth, especially in humans, is a very complicated process, which like all other essential events in organismic life directly influencing the existence and well-being of offspring (the “evolutionary currency”), has most likely been shaped to near-perfection in the course of many million years of hominisation.

In this contribution I will focus on some aspects which, I hope, will help to further the understanding of the biopsychosocial and medical wonder of birth. Let me start by saying, that in the Western cultures we have an anthropological concept that has been very influential, also for obstetrics. This is the concept of humans as defective beings. It was developed by Greek philosophers (Plato, 1984) and has been very prominent also in the time of the famous Arab doctor Ibn Sina, who is called Avicenna (1999) in the Latinised version. The concepts of theological philosophers have been influenced by the idea of human deficiency,

too. Thereby humans were seen as not only biologically but also morally defective: the Christian doctrine of the original sin.

In the thinking of philosophical anthropologists, especially of the German brand (e.g. Gehlen 1966), the idea was formulated like this: Humans don't have, unlike animals, the kind of physical performances and instincts they need, they cannot smell as well as a dog, they cannot run as fast as a gazelle, they cannot climb as well as a cat and they cannot stand for hours in the rain as a cow etc. Because we are defective, so this influential line of thought, we need culture – to make up for our defects: culture as a crutch.

This is a very non-evolutionary, non-biological view. In the perspective of evolutionary biology we humans are just as perfect products as any other animal (Bischof 1985, Schiefenhövel 2003), very well equipped for all the performances we have to deliver in our lives. Konrad Lorenz (1943) always asked, when the discussion came to the alleged deficiency of the human species, whether one could name any animal which could run 100 m in reasonable speed, then jump over a bar of about 1 m, dive down in the water to 3 m depth to pick up a couple of stones from the ground and at the end climb on a tree. His dictum was: humans are specialists for unspecialisation. Culture is not needed to make up for the postulated deficits of our nature, because culture is natural PART of our nature. This has still not been accepted, however, in some fields of the arts and humanities.

The paradigm of the defective human animal, instead, remains to be an important background for many human sciences and it has of course influenced medical thinking as well. Medical students and doctors are trained in the concept that the human body is defective. Daily, they see patients with whom something has gone wrong, it is difficult for them, therefore, to perceive the human organism as a miracle of evolution – which it actually is. This is the foil against which I would like to present some of my thoughts and some of our work.

Specific evolutionary problems with human birth

Human birth is more difficult than animal birth, basically because of two reasons: the bipedal stance and the big brain. We have all the weight on the pelvis and the consequence is, that the pelvis needs to be more rigid, its construction more solid than in animals, who normally carry approximately 50% of their body weight on the shoulders and 50% on the pelvis. Also the human perineum needs to be tougher, so that the intestines, the bladder and the uterus don't fall out. These are problems connected to the anatomy of *Homo sapiens* women, who have

had these features for some 100.000 years or so, features which are quite similar to those of their ancestresses in the time of *Homo erectus* about 2 million years ago.

Now to the obstetric costs caused by our brain. The adult human brain is very big in comparison and the intrauterine growth rate of the embryo skull is in accordance to this – apparently evolution could not produce a big adult brain from a small embryo brain. Yet, nature has solved the mentioned two rather serious basic problems in very clever ways of which I will only mention a few here. During the last part of pregnancy the symphysis in the ventral part of the pelvis, which is not a bony connection but a syndesmosis, starts to get soft and there is a millimetre or two by which the pelvis widens – this sounds little, but makes a whole lot of difference for the baby's head squeezing tightly through the birth channel. Another clever biological solution is to have the skull of the baby quite soft and the plates of the skull not connected in a bony way, so that the plates can move one over the other.

Perhaps the most clever invention of nature was, to have humans babies be born prematurely. If we look at the growth rate of the brain, then in animals, even in our cousins, the non-human primates, chimpanzees, gorillas, bonobos and orang utans, babies are born, when the growth rate of the brain has reached the flatter part of the curve. In humans, however, this curve goes on rather steeply until the approximately 11th month. We could never be born at that point in time, like it is the case with the other mammals, because our head would not fit through the birth channel any more. But evolution invented a very clever trick: physiological prematurity (Portmann 1941), i.e. the command "Get born after 9 months instead of 11!". This characteristic of the human baby has a very important developmental, non-obstetric consequence: physiological prematurity increases the pronounced altriciality of the human infant, causing parenting to be particularly intense. Especially the mother, therefore, plays a very important role: In the emotional safety of close body contact the infant is exposed to all those manifold and complicated stimuli the world's best learner has to feed the brain with. In this way, culture is internalised. The product is the adult *Homo sapiens*, the wise being – it grew from physiological prematurity.

When we look at different cultures – and this has been done by medical doctors for many hundred years already (doctors were always interested in the question: how do women in other cultures give birth) – we have two typical elements of child birth, which I consider species-typic for birth (Schiefenhövel & Schiefenhövel-Barthel 1999). One is the vertical position, which can be standing or kneeling, sitting, squatting and the like. The vertical birth position is a typical birth position

in all cultures, except our own industrialised cultures, where doctors decided, about 250 years ago, that the supine position should be the correct one. And, indeed, ergonomically speaking it is good for the doctor and the midwife, but it is very bad for the parturient. As I usually tell my students, after the headstand the supine position is the second worse you can find when it comes to give birth.

The second species typical characteristic is that birth is socially embedded. In order to illustrate this and the first point I will give a brief description of birth among the Eipo (Schiefenhövel 1991), a small (800 speakers of the Eipo language) ethnic group in the highlands of West-New Guinea (recently renamed Propinsi Papua).

Birth among Eipo women, highlands of West-New Guinea

Detailed accounts of childbirth among the Eipo, including transcriptions of the verbal utterances during the painful stages of labour, have been published elsewhere (e.g. Schiefenhövel 1988). In order to give the reader an idea of how birth takes place in an Eipo village I will summarize the data we have of the 7 witnessed cases and of some other 20 cases, for which we obtained verbal records of the partus itself and observational documentation for the postnatal period.

In the last stages of pregnancy the expecting woman continues to work in the garden. After some four or five hours of work she returns home with a bundle of firewood and a moderate load of sweet potatoes, greens and other food. She is thus almost as active as a nonpregnant woman. She does not, however, carry such heavy loads and walks less fast and more carefully. Since diabetes, hypertension and other circulatory and heart diseases were absent among the Papuan population of the interior of New Guinea (provided acculturation had not yet altered their dietary patterns and other ways of life), bacterial and viral infections or infestations with worms represented the only hazards for pregnancy and birth. We have never seen gestosis nor were complications of that kind ever reported to us.

It may therefore be safe to say that the primiparae of about 20 to 23 years of age, and the multiparae up to approximately 45 were generally healthy, physically well-trained parturients, who had the further advantage of being mentally and psychologically prepared for childbirth. They had witnessed their mothers, older sisters aunts and others throughout pregnancy and childbirth, and had seen that despite pain and sometimes delays, by far most of the babies had finally been born without serious problems or damage for mother and child. Eipo women consider their role as bearers and fosterers of children as normal

and natural – whether married (most of them were at the time of childbirth) or not (no terrible shame in their society) since pregnancy is deeply rooted not only in their experience of daily life but also in Eipo mythology.

As soon as she feels regular contractions the parturient woman moves to the women's house at the fringe of the village. In these usually rather small huts, the space of which is further diminished by large bundles of firewood stored there, the time of menstruation and puerperium is spent. The house may also be lived in by those women who are severely ill. There are often female visitors in the women's house who spend some time with the menstruating women, who themselves are free of all workload except for handicrafts, such as making string-bags etc. Access for men is strictly limited to male healers, who may be called in during cases of difficult labour. Therefore, the menstruation/birthgiving house, is something like a meeting point for women and girls and the counterpart of the men's house, to which only the men and initiated boys have access.

Especially primiparae are cared for in both a very humane and effective way: A traditional birth-attendant, i.e. the own mother, mother in law, or another female relative or friend who has had experience in childbirth, sits right beside the parturient woman, holding her, stroking her, talking to her, as well as fetching new fern leaves as an absorbent for vaginal discharge – in short, giving her all possible comfort in this materially very primitive culture. Sometimes the woman in labour and the one helping her appear to be almost one person, so close do they sit, side-by-side, the birth-attendant embracing the expectant mother or vice-versa. The labouring women, especially primiparae, are given advice on how to squat and press, not to touch their genital area etc. But rarely is this advice given in an urging, pressuring tone. This principle of personal care with a well-known, entrusted person who is present from the beginning of labour to the appearance of the placenta, and who maintains bodily contact with the expectant mother almost continuously, is the first thing one notices as one watches primiparae having their babies. Multiparae are usually given a little less attention, but should they need and wish help, it would of course be given immediately.

It is part of this principle of “make her feel comfortable” that the place where the birth takes place is very well-known to the parturient woman: she has been there during menstruation and many times before. It is also part of the tradition to treat the pain which occurs during the dilation and bearing down periods in an archaic way: massaging and stroking, i.e. making use of the cuto-visceral reflexes, the Head zones etc., and letting the labouring woman feel “you are not

alone". The religious elements of such straightforward practices call for the spirits of the ancestors to come to assistance, to take away the blockage of the birth-canal which they believe may have been caused by some malevolent spirit.

The second principle which becomes equally obvious from the first moments one watches birth among the Eipo is that of maintaining a vertical body posture during most stages of labour and birth. As has been shown by F.R. Narroll et al. (1961), R. J. Atwood (1976), H. Kirchhoff (1977), J. E. Roberts (1980) and others vertical postures for giving birth are chosen by almost all traditional societies, be they standing, sitting, kneeling or squatting, or combinations of these four basic possibilities. R. Caldeyro-Barcia et al. (1960), C. Mendez-Bauer et al. (1983) and other authors have demonstrated that these vertical positions are not only very common in non-western societies but also very physiological and effective.

A third principle is tied to the second: the woman in labour is free to choose her body posture. There seems to be a possible contradiction here: what if she chooses to lie down or even prefers the dorso-supine position? Actually it happens that Eipo women leave the vertical position to lie on their sides or, for short periods, on their backs. We have also seen them, in the first stages of labour, remain in the knee-elbow-position and forearm-elbow-position (which can be a very effective way to re-adjust the baby's head in the upper birth channel during early stages of labour) with their bodies at a downward angle instead of being vertical. But most of the time the women chose standing, sitting and squatting. As a matter of fact, we have not seen a single woman actually give birth in the dorso-supine position. Similar to the findings of M. Odent (1978, 1979), the Eipo data demonstrate that women, be they members of a pre-industrial or of an industrialized society, are very well able to find ideal or at least suitable body postures following the criterion of the relatively least painful position. The Eipo women, governed by a clear feeling for the most comfortable body positions, change these positions often: they stand up, walk around, kneel, lie down, sit and squat, they raise their bodies to a more upright position when they have a contraction (in a sitting position, for example), and lean back a little more in the pauses, in which they relax very well.

We sometimes had the impression that Eipo women used individually – not in a prescribed, formal way – techniques similar to auto-suggestion: their faces became very quiet, their pulse calm. There is, however, no tabu on voicing one's pain, on whining and crying during contractions. The parturient women sometimes expressed their pain in song-like patterns, which, in their descending melody, resemble the cross-culturally rather uniform mourning songs. They also

feel fear – fear that the birth might take too long, that they might die. In the six years for which we have data, no case of maternal or fetal perinatal death occurred.

In all the cases we have witnessed, the labouring women did not talk and did not seem to be concerned about the well-being of the baby in utero. All care and attention is directed towards the parturient, for the sake of her well-being, of her being relieved from as much pain and fear as possible. The Eipo have no means of directly assessing the fetal condition. Care for the child, therefore, starts only at the moment of birth.

As mentioned above, obstetrical measures are restricted to external procedures, like massaging the abdomen and the sides and the back of the parturient woman. No internal manipulation, not even at the introitus vulvae, are carried out. Inspection of the vulva, in the expulsion phase, was also rare. No manoeuvres are made to protect the perineum, yet we did not see a single case of severe rupture, nor did the approximately 140 women with whom we were in close village contact for almost two years show signs of such previous perineal ruptures, like urinary incontinence.

The women started to press hard only when they felt the urge to do so. They then held their breath for a while and used the abdominal muscles to the extent of exhaustion. Yet, they recovered very quickly, which is not surprising considering the good physical condition most of them were in. Towards the end of labour the women gave the impression of being determined to push the baby out, one could hear cries of pain every now and then, but no whining, resignation or despair was noted. During these last stages of labour they never spent more than seconds in a dorso-supine or lateral lying position. In 6 out of the 7 cases we witnessed, the baby was born while the mother was in a sitting position, which was often asymmetrical. In one case the baby was born while the mother was in a symmetrical squatting posture; this woman held onto a stick placed slightly above her head, it had been horizontally tied to the wall of the hut by her mother for just that purpose.

Striking for the western witness was the totally spontaneous birth of the shoulders and subsequent emergence of the child while neither the mother nor any of the birth attendants held or even touched her or him. The fetus thus took an active part in this last phase of birth. The period between the appearance of the head and the birth of the shoulders, took in one case more than 20 seconds. Until the emergence of the second leg, and thereby the whole newborn, more than 30 seconds went by. The sliding of the head and the body to the ground

was a smooth process. The child was born either on the earth floor of the menstruation house, where leaves had been spread out shortly before the birth, or on the grass outside the house. Our films of this event gives the trained obstetrician and the layman an impression of a most natural and physiological process. There was no hard impact of the head, since the vulva was no more than 5–10 cm from the floor. No newborn infant remained blue for more than a few minutes. The minority gave occasional cries and one urinated directly after birth.

The umbilical cord was never cut before the placenta was born. The latter was first covered with a few leaves and then the cord was severed with a small bamboo knife. No tourniquet was made, either on the child's or the mother's side. There was, however, very little bleeding in all but one case, where approximately 10 ml of blood may have been lost through the baby's umbilicus. During the 10 to 20 minutes it took for the expulsion of the placenta, the baby remained on the ground between the legs of the mother, who sat or squatted. This means that the baby's body was below the level of the uterus, thereby providing a chance for a transfusion of placental blood into the newborn's system. The Eipo do not lift the babies up before the placenta is born and the cord has been cut. The expulsion of the placenta is facilitated by special forms of abdominal massage.

The cutting of the umbilical cord marks the end of birth. The mothers, except in one case where birth took place in the women's house, stand up and take their babies, who are wrapped in clean leaves, into their arms and go inside the house. Ashes from the fireplace are sprinkled over the umbilical wound; we never saw any umbilical infection nor any case of umbilical tetanus, nor have I come across this condition during my ongoing research in Melanesia since 1965.

The time lapse after the breast was first given varied from immediately after the cutting of the cord to approximately two hours after that. No newborn was put to the breast before the placenta was born and the cord was severed. In normal cases, the umbilical cord seems to be too short in humans to allow breastfeeding in young mothers with firm breasts while the placenta is still in the uterus. Except in one case, where the baby appeared to be slightly premature and died after three weeks, all newborns drank and thrived well. Infant mortality in the first year of life, i.e. including perinatal death, was 7.6 % in the period from 1974–1980, which included several earthquakes and subsequent epidemics (possibly started by outside helpers). If one excludes this extreme period, infant mortality was a very low 3.8 %. Table 1 shows the mean duration of birth, placenta expulsion and puerperal seclusion.

Table 1. Mean duration of birth, placenta expulsion and puerperal seclusion.

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|--------------------------------------|------------|----------------------|
| Mean duration of birth | | |
| Primiparae | 14.5 hours | (12–18 hrs, 3 cases) |
| Multiparae | 9 hours | (4–18 hrs, 4 cases) |
| Mean duration of placenta expulsion | | |
| | 15 minutes | (7–25 min., 6 cases) |
| Mean duration of puerperal seclusion | | |
| | 5 days | (4–6 days, 7 cases) |

Discussion

A number of conditions in the Eipo society are advantageous with respect to birthgiving:

1. The women are healthy, physically well-trained, i.e. muscularly strong and possessing great stamina

2. The population, which has lived in marked isolation is genetically rather uniform (E. Büchi, 1978), that is to say, it is unlikely that a man of big skeletal build would have a child with a very small woman. Or to put it differently, the typical melting-pot situation of Europe and North-America, where disproportions of the child's head and the mother's pelvis are not uncommon, are very rare or non-existent in the Eipo society. This definitely helps the Eipo women in having an uncomplicated "natural" birth process.

For these and some other reasons, the situation in the Eipo society is not completely comparable to that of our own. It is, however, my conviction that cosmopolitan obstetrics and birth psychologists can learn from their "primitive" obstetrics and that women in industrialized countries may be well-advised to have the Eipo example in mind when preparing themselves mentally and physically for birth.

Another of the numerous differences between the two cultures is the fact that Eipo women who are giving birth to their first babies have seen this process many times in their lives. They know what to expect, therefore, and this reduces the fear which has an inhibiting effect on the birth physiology. Western girls and young women have almost never seen a birth (except perhaps in films) before their own time comes. I believe that this knowledge-vacuum should be filled. This could perhaps be accomplished by allowing girls and young women to be present in our delivery rooms when one of their relatives gives birth. The routine

of the delivery room would perhaps not be upset too much if a younger sister or other female relative of the expectant mother were added to the presence of the father. The young woman would thus have the chance to witness the elementary, forceful, but also intimate and emotionally unique process of giving birth. Under the prevailing conditions in our nuclear families living in urban settings often without well-developed individual bonds to their neighbours, the male partner of the expectant mother may well be the only person who is close enough to her to give her the necessary psychological support during childbirth. Yet, I would not hesitate to vote for his place being taken by a female relative or friend, who has a close personal relationship with the parturient as she could gain more from the experience than the baby's father. There are no studies yet on men who have been present during the birth of their partners with regard to longer-term psychosocial and sexual effects. Western countries have conducted a huge cultural experiment by including the newborn's father in the birth scene, the outcome of this experiment is by no means clear.

In by far the most traditional societies, birth is basically a female affair, and that this has been so even in Europe until some two-hundred years ago, when in the course of professionalizing medicine the male obstetrician took over from the midwife. This period was the historic turning point also for another, very important aspect of childbirth: the new male birth-attendants preferred the dorso-supine position of the "patients" because that facilitated their diagnostic and therapeutic measures. These specialists, trained in anatomy and pathology, were used to work in favourable conditions: the corpse on the table. In the time before, midwives had adapted their own body postures to that of their clients.

It is one of the great riddles of modern medicine why the advantages of vertical postures, which have been so convincingly demonstrated by various authors (e.g. Helle, 1999, for the effects of the "Maia" birth-stool allowing vertical positions), have still not been introduced in the majority of our obstetrical units.

The ethologists C. Naaktgeboren and E. Slijper (1970) have found that in a number of mammalian species the parturient females react with a stop in the birth process as soon as they are transferred from their own territory into a territory not known to them. For a number of animals it is clearly advantageous to have this kind of mechanism because it enables them to "postpone" the actual expulsion of the young, until safe, i.e. known ground is reached. For *Homo sapiens* there may well be remnants of this phylogenetically old imperative: "Give birth only where you feel at home!" Particularly as, in sociobiological perspective, the onset of life of one's offspring is such a vitally important period

which determines, more directly than most other episodes of the future existence, the biological success in the sense of inclusive fitness.

This is, incidentally, also the reason why it is very unlikely that human birth carries a high load of pathology: *Homo sapiens* would have died out rather fast. Birth is one of the few evolutionary “bottle neck” constellations (M. Konner 1982): two lives are at stake. The birth process had to be basically safe, being as difficult as it had become through bipedalism and the correlated changes in the pelvic channel plus the enormously large and fast growing brain. W. Trevathan (1987) has pointed out these and many other interesting evolutionary aspects of human birth, and also demonstrated that interfering with the normal regulation of birth may lead to unwanted effects.

Coming back to the topic “territory and birth”. It is a well-known fact among midwives and doctors that the frequency of uterine contractions regularly decreases when parturients leave their home to be transferred to the “foreign ground” of the obstetrical clinic or ward. Changing territory apparently interferes with the delicate physiocybernetics of the complex bio-neuro-endocrino-psychological process birth. From this, a plea for home birth can be deduced, rightly so in my eyes (see below).

Psychosocial stability is undoubtedly a prerequisite for the basically painful and anxiety-arousing time of labour and birth. It is, therefore, truly amazing that in the highly industrialized and administratively well organized countries, midwives work by fixed shifts just like any other personell in the medical or other profession. Midwives should, however, not be exchanged like post-horses. There are quite acceptable ways to organize a midwife's duty to suit both her and the interests of her clients. In the obstetrical department of the clinic in Pithiviers, south of Paris, I have been impressed by Michel Odent's (cp. 1976, 1979) system of using three teams of two midwives, each team being on duty for 48 hours (with good chances for one of the two to catch some sleep at a given time) and being off call for the next 72 hours. Thereby, it does not matter very much if one or both of them stay on for some hours to be with their client until the birth of the child and putting her/him to the breast for the first time. Midwives are, that is my experience in the last 10 years, usually most willing to change the work-routine to fulfill the needs of their clients and many of them regret having to leave a parturient because the shift plan and hospital administration requires it.

Who of our modern obstetricians witnesses natural, i.e. uninfluenced child-birth nowadays with immobilizing monitoring, oxytocin, chemical pain relievers,

epidural anaesthesia, episiotomies and artificial extraction being so common? Investigations into the effects of natural delivery have shown clear correlations between unimpeded, i.e. naturally occurring early bonding and a favourable outcome in later stages of the children (c.p. H. M. Klaus and J. H. Kennel 1976, S. G. Carlsson et al. 1978). We simply do not know enough about the complexity of childbirth and still interfere at many points and stages. We are unaware of the possible side-effects of epidural, peridural or general anaesthesia, of invasive monitoring techniques etc. on the physiology and psyche of the mothers and the onset of postnatal bonding.

It is quite conceivable that the pain produced by the spasmic contractions of the uterus (which alternates with periods for recovery) is, apart from its primary function to produce changes in posture and behaviour, important for normal birth because it leads to the release of endorphin and is so sharply contrasted with the absence of any pain, once the child is born. This contrast is often reported by women to be one of the deepest emotional moments in their lives. Besides being an emotionally most eminent phase for women, these moments may, just because of their powerful positive affect, constitute a major preparatory period for the onset of postpartal bonding (see below).

For a doctor it is very unusual, and therefore a rarely encountered situation, to see a person entrusted to him suffer pain without the doctor immediately doing something about it. As doctors we are trained to relieve our patient's pain, this is even part of the hippocratic oath. This reaction, however good in principle, must be qualified in obstetrics. Midwives and obstetricians should be emotionally able to stand the pain of the parturient and not take refuge in pharmacology and anaesthesia too early. The ancient principle should be called into use first, which is so well described by the German word "Behandlung" (treatment); the etymological derivation of this term is "the use of the hand" – which is the way the Eipo and other traditional societies treat labouring women.

The life of the individual child, often planned carefully by its parents, today is valued much more than in times before, when child mortality (and child population) was much higher. This necessary new view of the newborn has, among other factors, led to the development of technologically advanced perinatology. I would like to raise, in a similar way that Peter Dunn has repeatedly argued (1976, 1983) the question of whether we might not contribute more to the long-range well-being of our children if we developed a less invasive and interventive perinatology.

There are some promising developments, however, which take into account

the basic normality of by far most deliveries (appr. 95 %), the indisputable advantages of vertical postures and the role of psychological health and well-being of mother and child. It is my firm belief that the latter may become impeded by too much technomedicine and too little psychobiology involved. The use of strictly external monitoring of non-immobilized parturients with the help of small telemetric devices seems to be a favourable combination of monitoring and freedom of mobility. Other such promising developments are the creation of delivery rooms with "home appeal", the installation of clinics for outpatient delivery, and home birth in the parturient's own territory with the assurance that the midwife is not changed during the whole process.

The doctoral thesis of my student Andrea Sack (1990) analyses, very carefully and with modern statistics, 855 home birth of the Greater Munich Area which took place in the last years. For comparison: perinatal mortality in those clinics, which participated in the well known Bavarian Perinatal Study (Selbmann & Thieme 1988) was 0.40 % for all newborns above 999 grammes birthweight and without lethal defects; this is rightly considered an internationally very favourable figure. Among the 855 children who were born at home, the non-adjusted total perinatal mortality was 0.47 %. This is not the dramatic increase in risk which is forecasted by the opponents of home birth, if there is a statistically relevant increase at all, given the not quite comparable samples.

The many positive aspects of home birth, apart from the ones which have already been mentioned, may well lead established medicine and health politics in our country to reevaluate their position with regard to this form of delivery. – In my eyes pluralistic democracies must have pluralistic medical and thereby obstetrical systems.

An obstetrical "back to nature" must and will be in many ways more sophisticated than just being a postmodern alternative (and fully justified, in my eyes) movement, but rather a biologically, psychologically and medically sound process and, thereby, a step forward. It will open chances for less interventive, less invasive obstetrics and foster plurality, also in the field of childbirth: from out-patients birth to home birth and from squatting positions to caesarean section. Perinatal mortality is but one important factor in judging the outcome of childbirth; that is has, in the technologically advanced countries, dramatically decreased in the last decades has been primarily due to the increased survival rate of marginally vital premature babies, who can now be saved (often barely and with sad side effects). Progress with regard to the mortality of full term babies has been considerably smaller and may have reached its limit.

Birth related morbidity is another important, however often difficult to gauge parameter. As we increasingly gain knowledge about the intertwinement of psyche and soma, we will, in the future, understand better than today how the biopsychological process of bonding can prevent psychosomatic (in the widest sense) diseases and maladjustments. To enable birth to take place in an atmosphere where this bond can blossom, is a very important and, on top of that, free of charge measure to give newborns the best possible conditions to start their way into life.

The latest threat for natural childbirth is non-medically indicated caesarean section, usually called caesarean section on request. There is no space here to discuss the very serious consequences this newly developed life-style decision will have for the physiology and psychology of birth and for obstetrics and society in general. I would only like to stress again that human as all animal birth has been shaped to near-perfection in a long, selective evolutionary process and that we are far from understanding only a fraction of the finely tuned mechanisms involved (I only mention here the manifold role of oxytocin, not only as hormone for uterine contraction but also for bonding, a veritable love hormone, Carter et al. 1992). The option to make birth a technical process, painless and easy, albeit by no means without risk (the *sectio caesarea* still has a higher mortality risk than vaginal birth!) should be discussed in light of the wonders of biocybernetical selfregulation of processes in reproduction and the equally astounding processes of early bonding. I can only hope that the evolutionary voice will be heard by those who are about to shape the obstetrics of the time to come.

References:

- Atwood, R.J.(1980) Positions d'accouchement et compartements s'y rattachant. In: Rapoport, d. (Ed.) *Corps de Mère corps d'enfant*. Edition Stock. Paris: 73–124
- Avicenna (1999) *Canon of Medicine*. Kazi Publishers, Chicago
- Bischof, N. (1985) *Das Rätsel Odipus. Die biologischen Ursachen des Urkonflikts von Intimität und Autonomie*. Piper, München/Zürich
- Büchi, E. (1978) Forschungsprojekt *Physische Anthropologie, Sonderausstellung 'Steinzeit – heute' 9*. Staatl.Museen Preussischer Kulturbesitz, Berlin XII.
- Caldeyro-Barcia, R., Noriega-Guerra, F., Cibils, L., Alvarez, H., Poseiro, J.J., Pose S.V., Sica-Blanco, Y., Mendez-Bauer, C., Fielitz, C., Conzalez-Panizza, H. (1960) Effect of position changes on the intensity and frequency of uterine contraction during labor. *American Journal of obstetrics and gynaecology* 80 (2): 284–290
- Carlsson, S.G., Fagerberg, H., Horneman, G., Hwang, C.P., Larsson, K., Röndholm, M., Schaller, J., Danielson, B., Gundewall, C. (1978) Effects of amount of contact between mother and child on the mother's nursing behavior. *Developmental Psychobiology* 11: 143–150

- Cater, C.S., Williams, J.R., Witt, D.M. & Insel, T.R. (1992) Oxytocin and Social Bonding. In: Pedersen, C.A., Caldwell, J.D., Jirikowski, G.F. & Insel, T.R. (Eds.) Oxytocin in Maternal, Sexual, and Social Behaviors. Academy of Sciences, New York: 204–211
- Dunn, P. (1976) Obstetric Delivery Today – For better or for worse? *The Lancet* 10: 790–793. – (1983) Die Geburt als physiologischer Prozess – eine pädiatrische Sichtweise. In: Schiefenhövel, W. und Sich, D. (Eds.) Vieweg Verlag, Wiesbaden: 71–76
- Gehlen, A. (1966, 8. Auflage) *Der Mensch, seine Natur und seine Stellung in der Welt.* Athenäum, Frankfurt a. M.
- Helle, U. (1999) Vergleichende Untersuchungen von Geburten auf dem Maia-Hocker und im Gebärbett. Verlag für Wissenschaft und Bildung, Berlin
- Kirchhoff, H. (1977) The woman's posture during birth – from Prehistoric times to the present. *Organorama* 14: 11–19. Konner, M.
- Kirchhoff, H. Kirchhoff, H. (1982) *The Tangled Wing. Biological Constraints on the Human Spirit.* New York: Holt, Rinehart & Winston
- Klaus, M. and Kennel J. (1976) *Maternal-infant bonding.* Mosby. St. Louis
- Lorenz, K. (1943) *Psychologie und Stammesgeschichte.* In: Heberer, G. (Ed.) *Die Evolution der Organismen.* Gustav Fischer, Jena: 105–127
- Mendez-Bauer, C., Arayo, J., Roberts, J. (1983) Vorteile und Nachteile verschiedener mütterlicher Stellungen während der Geburt. In: Schiefenhövel, W. & Sich, D. (Eds.) *Die Geburt aus ethnomedizinischer Sicht.* Vieweg Verlag, Braunschweig, Wiesbaden: 77–80
- Naroll, F., Naroll R., Forrest, H.H. (1961) Position of women in childbirth. *American Journal of Obstetrics and Gynecology* 76 (4): 706–715
- Naaktgeboren, C., und Slijper, E. (1970) *Biologie der Geburt. Einführung in die vergleichende Geburtskunde.* Parey Verlag, Hamburg, Berlin
- Odent, M. (1976) *Bien naitre. Le Seuil –*
- Odent, M. (1978) *Alternative Obstetrical Positions and Counter Culture.* Paper held at 4th International Conference Ethnomedicine, Göttingen
- Odent, M. (1979) *Genese de l'homme ecologique.* Epi.
- Platon (1984) *Werke.* Band I.I. in der Übersetzung von F.D.E. Schleiermacher. Akademie Verlag, Berlin
- Portmann A. (1941) *Die Tragzeiten der Primaten und die Dauer der Schwangerschaft beim Menschen: Ein Problem der vergleichenden Biologie.* – *Revue Suisse de Zoologie* 48:511–518
- Roberts, J.E. (1980) A perspective of maternal position during labor. *Journal of Perinatal Medicine* 8: 255–264
- Sack, A. (1990) *Verlauf von 855 Hausgeburten im Münchner Raum von 1981 bis 1987.* Dissertation, Medizinische Fakultät der Ludwig-Maximilians-Universität zu München
- Schiefenhövel, W. (1988) *Geburtsverhalten und reproduktive Strategien der Eipo – Ergebnisse humanethologischer und ethno-medizinischer Untersuchungen im zentralen Bergland von Irian Jaya (West-Neuguinea), Indonesien.* Reimer, Berlin

- Schiefenhövel, W.- (1991) Eipo. In: Hays, T. E. (Ed.) Encyclopedia of World Cultures, Volume II, Oceania. G.K.Hall & Co, Boston: 55–59
- Schiefenhövel, W.- (2003) Mängelwesen Homo sapiens? – Vom Menschenbild in Anthropologie und Medizin. In: Hinterhuber, H., Heuser, M. P. & Meise, U. (Hrsg.) Bilder des Menschen. Das Menschenbild der Psychiatrie, der Medizin, der Religion und Künste, der Kultur- und Sozialwissenschaften. Verlag Integrative Psychiatrie, Innsbruck: 141–146
- Schiefenhövel, W. & Schiefenhövel-Barthel, S. (1999) Das menschliche Leben zwischen Werden und Vergehen. In: Brockhaus-Redaktion (Hrsg.) Brockhaus Mensch, Natur, Technik. Phänomen Mensch. R.A. Brockhaus, Leipzig u. Mannheim: 23–91
- Selbmann, H.K. und Thieme, Ch. (1988) Die Bayerische Perinatalerhebung im Jahre 1987. *Bayrisches Ärzteblatt* 8: 297–301
- Trevathan, W.R. (1987) *Human Birth: An Evolutionary Perspective*. Aldine de Gruyter, Hawthorne, New York