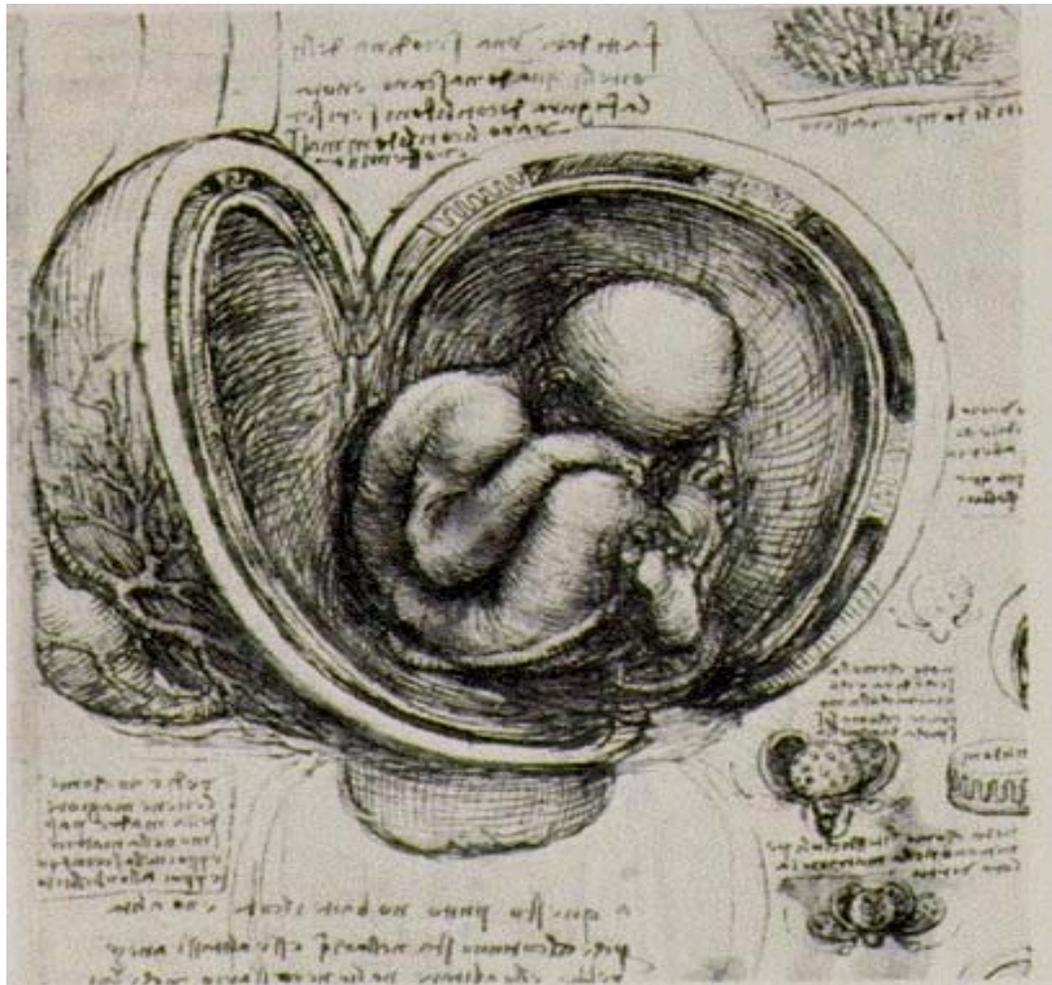


INTRODUCTION TO PRENATAL PSYCHOLOGY



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INTRODUCTION

Prenatal psychology at its very core is the simple extension of commonly held and accepted developmental psychological principles into the period prior to birth. Like child psychology or adolescent psychology, prenatal psychology is the study of the human organism within a particular period of time, with specific attention given to the unique capabilities, limitations, and environmental factors typical of development at that stage.

Among the factors making prenatal psychology different from any other developmental stage is the unique environment of the womb, and the almost complete dependence that this environment implies for the embryo and the fetus. Dependence, however, does not mean a lack of development, or imply the absence of a unique and developing personality. Infants remain relatively dependent on others to insure their survival, and yet, the evidence is overwhelming that infant development and personality exists.

This understanding of infancy as a psychologically significant stage of life is relatively recent. Prior to the 1960's, the neonate was regarded almost exclusively as a physiological being (Rau, 1982). The introduction of Brazelton's Neonatal Behavioral Assessment Scale in 1970 had a profound effect of changing attitudes towards the newborn (Schindler, 1988). By 1973, William James' infamous description of the infant's perception of the world as "blooming, buzzing confusion" was being replaced by the concept of the "competent newborn" (Stone, Smith & Murphy, 1973). This change in perception was slow, and was forced by the accumulating research evidence. More than 30 years later, this notion is now widely accepted and taken for granted.

Rau, writing in 1983, described the change in perceptions of the neonate that had occurred:

And so arose the picture of a baby that incorporates the essential and psychologically important characteristics-- even if they are still only rudimentary-- which also form the older child and adult, respectively. It is the picture of an active organism, one which contributes to its own development in interaction with the world around it. As a result, it can now even be described in terms of subject, not only in objective terms which are already well-known (Rau 1983, p. 83).

Rau's description applies equally well to the fetus, who, like the baby, is also an "active organism" with "essential and psychologically important characteristics", who also "contributes to its own development in interaction with the world around it". This is the subject and content of this book. We will be examining each facet of prenatal development, beginning with conception, and continuing into the embryonic and fetal periods, culminating with birth. We will describe the prenaté's "world", and include discussion of his mother, her behavior and environment, the placenta, the womb, and the umbilical sac. Finally, we will examine how development of the prenaté within his environment is clearly psychological. The prenaté is our subject, and not just the object of study, for this book.

The notion of the "competent fetus", however, is still not widely accepted. Similar to the perception of the newborn in the 1960's, the prevailing view of prenatal life continues to be one of viewing the fetus as relatively passive and inert physiologically and devoid of meaning psychologically. Even in the face of large amounts of accumulating evidence to the contrary, the physiological and psychological capabilities of the fetus continue to be minimized and disregarded.



There are several reasons why general perceptions of prenatal life have not yet "caught up" with the research data and evidence. One explanation may be the fact that interest in embryology extending as far back as the middle ages and before, has been primarily oriented towards anatomy and the "mechanics" of pregnancy and birth and not towards a fetal perspective. Thus, the legacy of this outlook has been to view the fetus, "apart from some aimless kicking which began in the fifth month . . . [as] as placid, fragile vegetable who developed quietly in preparation for a life which started at birth" (Liley, 1973, p. 192).

Although interest in the dynamics of intrauterine life continues to slowly change, there is still the tendency to begin with adult functioning and work backwards, eventually arriving at the prenatal period. Intentional or not, this "comparative" mentality has contributed toward the regard of the preborn and newborn as inadequately functioning adults rather than well functioning fetuses and neonates.

An additional factor which continues to influence perceptions of fetal capabilities may be a much-cited study by Langeworthy in 1933 titled *Development of Behavior Patterns and Myelinization of the Nervous System in the Human Fetus and Infant*. This study made the assertion that "incomplete myelinization of sensory tracts" resulted in the inability of the fetus to receive neural messages from its specialized sense receptors. However, research subsequent to Langeworthy's study has clearly shown that full myelinization, which occurs only after birth, is not essential for sensory functioning. While full myelinization does increase the rapidity of conduction, well-organized neural activity and sense receptivity is possible long before the nerve fibers are completely myelinated (Bekoff & Fox, 1972). DeMause has noted that Langeworthy's "incomplete myelinization" misstatement "continues to be used to deny the ability of the fetus and the newborn to feel pain in many areas of medicine, from the use of aborted fetuses as subjects in painful medical experiments to the denial of anesthesia during circumcision and surgery of the newborn" (DeMause, 1982, p. 253).

Further, the modern discussion of the notion of "consciousness" as it relates to adults, and the difficulty in defining the term adequately, has led to the view that the term itself is taboo. Chamberlain points out that "it is unfortunate that for all concerned that these specialties [obstetrics and pediatrics] came to prominence in during as era of psychology when the subject of consciousness was taboo and neonates were considered essentially decorticate. Therefore, virtually all the routines of modern obstetrics and pediatrics presuppose an infant who is without personal thought, feeling, or memory-- a position which, I think, can no longer be reconciled with the facts" (Chamberlain, 1983, p. 3).



Various ethical issues related to human embryological and fetal research have rightly prevented certain types of investigations. Thus, particular data regarding fetal life was simply unavailable. The result was an over-reliance on comparative animal studies, which ultimately has proved to be inadequate. This is due to the great variation between human and animal, even human and mammalian, reproductive physiology, psychology and embryology. While still important, especially in research on teratogens, animal studies prove less than satisfactory

when seeking data on specifically and uniquely human characteristics.

Previous lack of technology has also contributed toward a faulty understanding of fetal functioning. As technology (including sonography, photography, sound spectrography, electroencephalography) has become more and more sophisticated, a "window" on the embryological and fetal life of human beings has been opened which was previously unavailable. Various forms of medical technology has also pushed the threshold of "viability" earlier and earlier, in a sense allowing external observation of the entire "third trimester." These technological advances have served to provide a huge opportunity to study fetal life, and consequently correct previous faulty assumptions.

Commenting on the confluence of these variables, Davies has written that perhaps study of fetal life has been lacking due to the fact that the fetus itself was so "inconveniently tucked away in a most inaccessible situation. This area of medicine offered little opportunity for discovery, and did not attract much talent. Why study a creature so passive, so dull, so small, and technically so difficult?" (Davies, 1973, p. 965).

Finally, and perhaps most importantly, attitudes toward legal abortion and its acceptability have implicitly influenced the acceptability of the idea of the "competent fetus". The notion of a fetal personality with unique and distinct character traits and behavioral competencies implies a conceptualization of fetal personhood not unlike infant personhood. Abortion of a fetal "person" is thus indistinguishable from infanticide. Consequently, there has been

resistance to the idea of “prenatal psychology”, predominantly among those who affirm the acceptability of abortion, particularly the late-term variety (also called partial-birth abortion) of the practice.

But the research evidence is now substantial and overwhelming enough that denying the physiological and psychological sophistication of prenatals is to ignore reality. As will hopefully be evident from the remainder of this book, the confirmation is overwhelming that the fetus is indeed amazingly competent.

HISTORY OF PRENATAL THOUGHT

Early Western Thought

The idea that the prenatal environment affects the developing organism is certainly not new or unique to the last century. Many early thinkers speculated, some accurately and others mistakenly, regarding fetal behavior and psychology as well as the influence of maternal and/or environmental determinants of fetal outcomes. Democritus and Epicurius both surmised that the embryo ate and drank *per os*. Plutarch later compared these views to that of the earlier Alcmaeon who postulated a “sponge” theory of prenatal nourishment. Plutarch wrote that “Democritus and Epicurius hold that this imperfect fruit of the womb receiveth nourishment at the mouth. . . . But Alcmaeon affirmeth that



the infant within the mother's wombe, feedeth by the whole body throughout for that it sucketh to it and draweth in a manner of a sponge” (Plutarch in Gupta & Datta, 1988, p. 514).

Writing about the same time as Alcmaeon, Empedocles theorized regarding the origin of twins and affirmed the profound influence of the maternal imagination upon the fetus, to the point that it could be guided and interfered with at will.

With the work of Hippocrates and those associated with him, namely his son-in-law Polybus, embryology takes a great leap forward, particularly with his treatise *On Semen and on the Development of the Child*. Hippocrates rightly surmised that it is the maternal blood flow which nourishes the embryo. Further, he argued that the umbilical cord allowed for fetal respiration (Ellinger, 1922).

During the next century (4th century, BCE), Diocles of Carystus extended embryological thought through his examinations and dissections of fetal remains. He reported that he had found traces of the head and spinal cord in a 27-day-old embryo and was able to clearly distinguish the human form at 40 days (Allbutt, 1921).

With the possible exception of Hippocrates, Aristotle stands out among the early Western thinkers as the most important advancer of embryological science. Due to his extensive dissections of various animals and animal embryos, his observations filled several major works of general and comparative biology and embryology, among them *On the Generation of Animals*, *The History of Animals*, *On the Parts of Animals*, *On Respiration*, and *On the Motion of Animals*. He correctly understood the nature of fetal nutrition and he anticipated several important aspects of embryology, among them genetics and enzyme actions. Interestingly Aristotle also speculated that sensation is first acquired during pregnancy.

Following Aristotle, embryological understanding in the western tradition stagnates, and even regresses. But exceptions to this trend also stand out. For instance, Herophilus of Chalcedon, a member of the Alexandrian School and writing in the 3rd century BCE made many dissections of embryos and described in some detail the ovaries, Fallopian tubes, and the umbilical cord (Gupta & Datta, 1988).

In addition to the Greek thinkers, two Romans also made contributions toward the understanding of embryology that lasted well into the Middle Ages. In the 1st century AD, Soranus of Ephesus wrote a book titled *On the Disease of Women*, which, although largely obstetrical, also showed an advanced understanding of embryology. Tertullian, writing in the following century and arguing that the fetus is already a living being in the uterus, stated that “Soranus . . . [was] sure that a living creature had been conceived” (Jackson, 1988, p. 109), thus implying at least a rudimentary acknowledgement of the separate life of the fetus.

The second Roman of note was Galen, who lived in the 2nd century AD and wrote three works touching on embryology with the intriguing titles of *On the Anatomy of the Uterus*, *On the Formation of the Fetus*, and *On the Question as to whether the Embryo is an Animal*. Galen called the processes of intrauterine life “genesis” and while much of his descriptions of it are inaccurate, he alludes to the processes histogenesis (tissue-production) and

organogenesis (differentiation of tissue into organs) as "alteration" and "shaping" or "molding." The period of "genesis", according to Galen, includes four distinct stages (Gupta & Datta, 1988): (1) an unformed seminal stage; (2) a stage in which the *tria principia* are engendered (the heart, liver and brain); (3) a stage when all the other parts of the body are mapped out; and (4) a stage when all the other parts have become clearly visible

There are also historical accounts that Cleopatra, the prominent Ptolemaic queen, supervised her own somewhat gruesome embryological research studies in 1st century BCE. However, most experts note that the original source of this cannot be traced and so the account must remain in the category of "legend". It was said that Cleopatra dissected live female slaves "... impregnated by prison guards at known intervals of time from conception-- following the procedure of Hippocrates with regard to hen's eggs. This Alexandrian experiment established that the male fetus was complete in 41 days and the female in 81" (Gupta & Datta, 1988, p. 531).

Early Non-Western Thought

Preceding and parallel to the early Greek and Roman embryological advances was an active tradition of speculation regarding embryological and fetal processes in places outside of the traditional "west". Most prominent are a group of Indian writers, the earliest being Susruta, around the late 6th or early 5th century BCE.

Similar to the early Greek and Roman thinkers, much of their speculation was faulty, but much also anticipated later discoveries. For instance, modern genetics is prefigured with Susruta's affirmation that "the bodily and mental characteristics of the future child, whether manifest or latent, are pre-determined" (Gupta & Datta, 1988, p. 521). He divided the "genetic" contributions of each parent according to sex, with the father contributing the "stable and firm components" of the body (the hair, nails, bones, nerves, arteries, veins, teeth, tendons and semen) while the "soft components" (blood, fat, muscles, heart, bone-marrow, liver, spleen, intestines, umbilicus, rectal parts, and sex organs) result from the mother's "genetic" contribution. Emerging from the "physiological and spiritual harmony" of the parents are the "genetic" characteristics of intellect, health, valour, constitution, and "brightness of complexion." (Susruta, 1954).

Susruta also clearly articulated a sophisticated understanding of the interdependency of the fetoplacental unit, both physiologically and psychologically. He noted that nourishment from the mother's body begins by means of the umbilical cord as soon as the fetus is "endowed with life" and advocated a variable diet for mother and child depending upon the needs of the growing fetus. In addition, Susruta maintained an understanding of the impact of the mother's psychological state upon the emerging fetus. Following the third month when all the major limbs and organs are present in their rudimentary forms, Susruta states that the fetus acquires a consciousness of its surroundings and begins to "long for" sense objects. These "longings" are imparted to the mother and are expressed externally through the mother's "desires." If the exchange is short-circuited and these desires are denied, suppressed or remain unfulfilled, then the effect on the fetus can be profound. According to Susruta, various congenital defects such as paralysis, dwarfism, blindness, various sense organ defects and lameness can be the result.

That Susruta maintained some sort of fetal psychology was clear. Along with the above stated affirmations of consciousness and sense perception, he noted that the fifth month resulted in the acquisition by the fetus of a "mind of its own" and is said to "awaken". This was quickly followed by the realization of an "intellect" in the 6th month.

A second prominent early Indian thinker in the area of embryology is Caraka, who shared similar theoretical notions with Susruta regarding the "genetic" contributions of the mother and father to the developing fetus. From the mother come the "skin, blood, flesh, fat, navel, heart, liver, spleen, kidneys, urinary bladder, colon, stomach, intestine, rectum, anus, small intestines, large intestines, and mesentery", while the father contributes the "head-hairs, beards-mustaches, nails, body hairs, teeth, bones, ligaments, and semen" (Caraka, 1982, p. 421). The fetus' appetite, vitality, clarity of senses, and quality of voice all arise out of parental harmony while the qualities of life-span, self knowledge, mind, sense organs, respiration, impulse, sustenance, characteristic physiognomy, voice and complexion, happiness, misery, desire-aversion, consciousness, restraint, intellect, memory, ego and will are caused by the fetus' self, known as *jiva*.

Caraka also shared with Susruta an understanding of the importance of fetal nourishment. He maintained that the child's shape, vigor, energy and sense of contentment all arise as a result of proper nourishment. According to Caraka, the physiological process of embryonic and fetal development proceeds from that of "shapeless jelly" the first month to being "tumor-like" or fleshy the second to limb and sex-organ differentiation the third month and so on. He believed the fetus' and mother's hearts to be connected through the umbilical cord and placenta, transmitting nourishment through the blood, as well as "vitality and complexion." Caraka assumed that the fetus could be

destroyed, deformed, or suffer psychologically due to physical or emotional disturbances of the mother. Indeed, Caraka was very aware of the possible prenatal psychological influences on the emerging child's psyche and listed a comprehensive catalogue of possible mental stress, shocks, and maternal habits which might cause psychological damage to the fetus. He writes:

The woman sleeping in open places and moving out in the night gives birth to an insane; if she indulges in quarrels and fights, the progeny will be epileptic. One indulged in sexual intercourse to ill-physiued, shameless, and devoted to women; one always under grief to timid, undeveloped or short-lived; one thinking ill of others to harmful, envious, or devoted to women; the thief to exerting, wrathful or inactive; the intolerant to fierce, deceitful and jealous; one who sleeps constantly to drowsy, unwise and deficient in digestive power; one who takes wine constantly to thirsty, poor in memory and unstable in mind. . . . The pregnant woman gives birth to a child suffering mostly from the respective disorders the etiological factors of which are used by her. Thus the facts causing damage to the fetus are said. Hence the woman desiring excellent progeny should particularly abstain from the unwholesome diet and behavior. Observing good conduct, she should manage herself with the wholesome diet and behavior (Caraka, 1982, p. 468).

In addition to Susruta and Caraka, other Indian thinkers also made various embryological speculations. Most concurred with Susruta and Caraka, indicating a striking congruity on the subject of a fetal psychology, especially as it relates to sense perception and consciousness. One example is from a man named Parasara, who wrote that "during the sixth month, holes appear in the ears of the embryo. During the seventh month vessels, ligaments, bones, phalanges, hair on the head, nails and skin appear on the embryo. The embryo becomes more conscious during this month" (Parasara, 1968).

Medieval and Early Modern Thought

Following Galen, the advance of embryology and fetology was, at least in the Western tradition, arrested for almost 13 centuries. While several works do occur, they are essentially composed of restatements or compilations of Hippocrates, Aristotle, Sorenus and Galen. For instance, Albertus Magnus' *De animalibus* from the 13th century was essentially a close restatement of Aristotle and Galen, especially as it relates to areas of embryological interest.



Perhaps one exception to this is Trotula's 11th century text on various gynecological ailments and their cures (Trotula, 1981). Trotula, thought to be a woman, was associated with the medical school in Salerno, Italy. Her work was not available in an English translation until the middle of the 15th century but still preceded by almost a century what was at one time thought to be the earliest obstetrical text to appear in English, *The Byrth of Mankynde*, translated from Eucharius Rosslin's *Der Swangern Frawen und Hebammen Rosegarten*, first published in 1513 and first appearing in English in 1540.

Similar to the medieval period, various derivative works continued to appear in the 15th and 16th centuries. However, several small advances began to appear, including Leonardo da Vinci's embryological and fetological statements, drawings and illustrations. With the publication in 1604 of Hieronymus Fabricius' *De formato Feotu*, the description and illustration of the physiological dimension of embryology and fetology takes a great leap (Cunningham, 1985). But this publication, and the ones preceding and it, contain little if any speculation regarding the existence of a fetal psychology.



Up until the 16th century, the prevailing view of embryological development was the epigenetic, that the various components of the developing creation occurred sequentially. The historic weakness to this conceptualization is that it did not adequately account or the complex mechanism of the "creation" of life itself (McLaren, 1985). A less dominant but plausible rival view was the preformation theory, which argued that embryonic life in miniature already existed within the parent and thus development

consisted simply in growth, not creation. Such an argument, postulated early on by Plato and Aeschylus among others, came into vogue during the late 16th century. But because of the inability to locate an ovum or sperm in the uterus, the epigenetic line of reasoning was revived by some. William Harvey, for instance, in his important 1651 work *De generatione animalium*, took this view (McLaren, 1985).

The period of the end of the 17th through the end of the 19th century brought about significant technical and "physical" advances in embryology and fetology. With the availability of the microscope at the close of the 17th century, the sperm was first seen by Hamm and Leeuwenhoek in 1677 following by five years the observation of the ovarian follicles by de Graff. Thus, the preformation theory again begins to prevail, but is split between two camps, the "animalculists" and the "ovists", the latter holding that the miniature offspring was to be found in the ovum and the former that it was to be found in the sperm. The preformationist view in its various manifestations predominated until at least the middle of the 18th century.

It was also during this period that some speculation regarding fetal cognition and understanding takes place. John Locke, writing in his *Essay Concerning Human Understanding* speculated that the capacity to form ideas may be characteristic of fetal life. Jean-Jacques Rousseau, writing in the next century, alternately regarded the fetus as a "witless tadpole" eventually born with a "tabula rasa" for a mind (Hepper, 1989).

The late 18th century brought some important advances, including Spallanzani's application of the experimental method to embryology which finally demonstrates that both the ovum and sperm are necessary for conception to occur (Patten, 1946). This discovery, along with a general lack of evidence for the preformation theories resulted in a switch back to the epigenetic argument, this time permanently, although the change was quite gradual. The preformationist theory was permanently laid to rest in 1900 by Driesch who showed that forms of the cells of a fertilized egg, can, when separated, develop into complete embryos. The present view is that "development is strictly preformational as regards the genes and their hereditary influences, but rigorously epigenetic in actual constructional activities" (Arey, 1954, p. 4).

The late 18th and 19th centuries brought many technical advances. For instance, William Hunter's *Treatise on the Human Gravid Uterus* was published in 1774 and was an important advance in embryological and fetal observation and illustration. Von Bauer finally clearly identified the mammalian ovum in 1827 (Arey, 1954) while Schleiden and Schwann lay the foundations of modern embryology with the formation of cell theory (Patten, 1946). Wilhelm His' book *The Anatomy of Human Embryos*, published in 1880, stands as the first great modern work dealing with specifically human embryology.

20th Century Thought

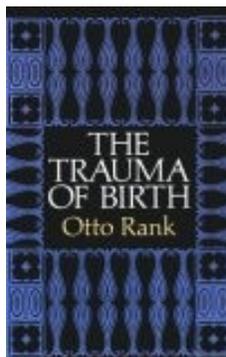
With the biochemistry, biology, anatomy and neurology of embryology and fetology gradually becoming clearer through much of the early to middle part of the 20th century, the groundwork was laid for a return to substantial speculation about the psychological sophistication of the fetus. Certainly crucial to this debate was the thought of Sigmund Freud. His impact upon the subsequent psychodynamic understanding of fetal life was profound and undeniable. Addressing Freud's negative influence on prenatal psychology, deMause writes that ". . .virtually all contemporary psychoanalytic theory denies the possibility of mental life before or during birth. The newborn is believed to be without memory, ego, objects, or mental structure" (deMause, 1982, p. 247).

But whether intentional or not, Freud "opened the door" (Lake, 1978) to a consideration of the psychodynamics of intrauterine life. Freud himself appears to be inconsistent. For instance, Freud wrote in *Inhibitions, Symptoms and Anxiety* (1936) that "birth still has no psychic content" and "birth is not experienced subjectively as a separation from the mother since the foetus, being a completely narcissistic creature, is totally unaware of her existence as an object". However, in the same work he also referred to birth as the "earliest anxiety of all" and the "primal anxiety." Frank Lake cites Freud as writing that "there is much more continuity between intra-uterine life and the earliest infancy the impressive caesura of the act of birth allows us to believe" (Freud in Lake, 1978, p. 5).

Phyllis Greenacre, writing regarding Freud's position notes that even though "he doubts the importance of the individual birth experience in influencing the quantum of the anxiety response, largely because the birth experience is without psychological meaning, at the same time, nevertheless, he emphasizes the continuity of the intrauterine and the postnatal life" (Greenacre, 1952, p. 52). D.W. Winnicott noted that Freud held to his view of birth being psychologically inconsequential most of the time. However, he also writes that "the only time when he was said to

have deviated from this view was once when he was heard to have wondered if an infant born by Caesarian section might have a different pattern of anxiety" (Winnicott, 1958, p. 175).

Freud's schizophrenic attitude toward birth is perhaps illustrated by his initial embrace of Otto Rank's book *The Trauma of Birth* as "the most important progress since the discovery of psychoanalysis" (Freud in Lake, 1981, p. 3).



However, he apparently turned against Rank at the behest of Abraham, Jones and some of the others of his inner group who warned that Rank's book would eclipse Freud's work (Taft, 1958). Later, in writing to Abraham, Freud alluded that he was "getting further and further away from birth trauma. I believe it will 'fall flat' if one doesn't criticize it too sharply, and then Rank, who I valued for his gifts and the great services he has rendered, will have learned a useful lesson" (Fodor, 1971, p. 39).

Otto Rank began his study of the possible effect of birth experiences in 1904, finally publishing *The Trauma of Birth* in 1923. This work, which clearly laid the groundwork for an understanding of the effect of pre-natal events on subsequent functioning, described Rank's contention that not only was birth the first experienced anxiety, but that it was the prime source material for all the neuroses and character disorders. It was the "original emotional shock underlying all personality dysfunction." Rank wrote that "we believe that we have discovered in the trauma of birth the primal trauma," and that "we are led to recognize in the birth trauma the ultimate biological basis of the psychical." He continued: "We have recognized the neuroses in all their manifold forms as reproductions of, and reactions to, the birth trauma" (Rank, 1952, p. xiii).

While Rank did not articulate a fetal psychology per se, he alluded to the significance of the prenatal:

All symptoms ultimately relate to this "primal fixation" and the place of fixation is "in the maternal body" and in peri-natal experiences." He continues by writing that "we believe that we have succeeded in recognizing all forms and symptoms of neuroses as expressions of a regression from the stage of sexual adjustment to the pre-natal primal state, or to the birth situation, which must thereby be overcome" (Rank, 1952, pp. 78-79).

Building on Rank's work, Donald W. Winnicott (1957; 1958; 1972), a British pediatrician and psychoanalyst, continued to push the "primal" influence back earlier, alluding more strongly to the importance of pre-natal life. Although, like Rank, his primary emphasis was still on birth as an event "etched on the memory" that manifested itself in the stresses of later life, he also alludes strongly to the possible effect of the prenatal period, extending back as far as conception, upon the developing psyche. He writes that "there is certainly before birth the beginning of an emotional development, and it is likely that there is before birth a capacity for false and unhealthy forward movement in emotional development" (Winnicott in Lake, 1987, p. 169).

An American contemporary of Winnicott's was Phyllis Greenacre, who, in her book *Trauma, Growth, and Personality* also makes allusions to the possible impact of the prenatal environment, but subsequently seems to back away from the implications. She writes "The fetus moves, kicks, turns around, reacts to some external stimuli by increased motion"(Greenacre, 1952, p. 54). Indeed, research showing the increase of fetal heart rate and fetal movements to such stimuli as loud noises and maternal nervousness would indicate that these are signs of anxiety, as they would be in the child or adult. While Greenacre retreats from any kind of affirmation of a distinctly "fetal anxiety", probably due to persuasion by Freud (Ridgeway, 1987), she did affirm that anxiety-like responses in the fetus give rise to a predisposition to anxiety in the child and adult. She summarizes her own ambivalence to birth and pre-birth anxiety when she wrote that "perhaps the struggle of birth is at once too terrifying and too inspiring for us to regard it readily with scientific dispassion" (Greenacre, 1945, p. 40).

While Freud, Rank, Winnicott, Greenacre and others all made allusions to the possible importance of the prenatal, it is in the work of Nandor Fodor and his follower, Francis Mott, that the prenatal is specifically emphasized. It is Fodor's work *The Search for the Beloved: A Clinical Investigation of the Trauma of Birth and Pre-Natal Conditioning*, which was published in 1949, that really marks the beginning of the modern "prenatal psychology" movement. As is clear with the title of the book, the first part of the book was devoted to birth trauma, while the second part is devoted to the "Traumata of the Unborn." Fodor affirmed the importance of birth for later development, the therapeutic effect of re-experiencing birth and prenatal life, the specific problems raised by particular maternal habits and behavior such as rejection of the fetus and attempted abortion. He wrote:

The life of the unborn is not necessarily one of unbroken bliss. The unborn child is dependent on his mother's blood-stream for oxygen, for food, and for the elimination of its waste products. There are many maternal afflictions that affect and perhaps weaken the child before birth. Many children seem to start post-natal life with a handicap (Fodor, 1949, p. 396).

In the same book several pages later, Fodor affirmed that the prenatal period was more crucial than birth for subsequent functioning. He writes that "the release of the trauma of birth is the introductory phase of the integration of pre-natal trauma. The more vital phase concerns the shocks suffered prior to birth. In order to release these shocks, the mind must take cognizance of their existence and nature" (Fodor, 1949, p. 400). Fodor approvingly quotes an earlier writer named Sadger to indicate his position. Sadger wrote that he believed "that which all my patients assert, that the embryo already feels plainly whether its mother loves it or not, whether she gives it much love, little love, or none at all, in many instances in fact in place of love, sheer hate" (Sadger, 1941, p. 336).

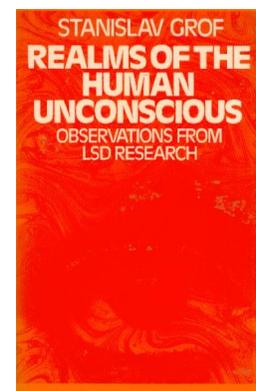
Francis Mott's work was primarily based upon the analysis of various case histories, particularly dreams. He was as explicit in his emphasis upon intrauterine life as Fodor was. His fundamental principle was that "every psychological feeling derives from an older physical feeling." For instance, the very basic psychological sense of "I" is originally derived from the physical sensation of contact between the fetal skin and its environment. Thus, the bi-directional flow of blood from mother to fetus as mediated by the placenta through the umbilical cord, gives rise to the physical "feelings" of aggression, submission, emptiness, fullness, giving and taking that is the basis for subsequent psychological "feelings". Mott utilized the term "umbilical affect" to designate this exchange, defining it as the "feeling state of the fetus as brought about by blood reaching him through the umbilical vein" (Mott in Moss, 1987, p. 203). As Mott envisaged it, the umbilical vein not only conveys nutritive resources and as such could be experienced as a "life-giving flow, bringing . . . renewal and restoration" but could also "be the bearer of an aggressive thrust of bad feelings into the foetus if the mother herself was distressed and 'feeling bad.'" If the mother felt emotionally unsupported, then "this feeling of deficiency, lack of recognition and the failure of looked-for support, would be just a specifically felt by the fetus. It became distressed by the failure of its immediate environment to provide the expected acceptance and sustenance, not so much at the level of metabolic input . . . but to nourish the earliest beginnings of the person in relationship" (Mott in Lake, 1987, p. 1).

Stanislav Grof's work is contemporaneous with that of Mott's. His analysis, however, was less dependent upon dreams as the content for his theories and very dependent upon LSD-assisted abreactations. Beginning in 1953, Grof began utilizing LSD as a psycholeptic agent in therapy. On the basis of an analysis of over 3000 LSD-therapy sessions, Grof (Grof, 1975; Grof & Halifax, 1977) found that patients described feelings and experiences, some of transmarginal stress, relating to their pre- and peri-natal experiences. Many of these experiences were later confirmed both by hospital records as well as by those who had been present at the birth of the patient.

On the basis of his research, Grof divided up the perinatal experience into four "basic perinatal matrices" and described the phenomenology of each. The first, called "Life in the Womb", was composed of the recollections of fetal life and involves the summation of experiences with which the baby faces the impending experience of birth. This summation tends to be either the positive "experiences of an undisturbed intrauterine environment where the basic needs of the embryo/fetus/baby are met" (Lake, 1981d, C56), or the negative recollections of the "bad womb" situation such as fetal crises, emotional upheavals in the mother and attempted abortions.

The second matrix, called "No Exit", and occurs at the beginning of labor but before the cervix opens. The "good womb" experience, where it has occurred, is inexplicably terminated and the supporter of the fetus for the last nine months becomes the aggressor. There is relentless force to "push out" the constricted fetus which can seem destructive or even murderous. Those that have suffered a "bad womb" experience are having their earlier traumas recapitulated and reconfirmed. Regardless of the experience of the first matrix, the still-closed cervix, combined with the contractions of the uterus, temporarily creates a trapped, hopeless feeling of "no exit".

The third phase involves the actual process of birth. The cervix opens and the fetus and womb begin to elongate. The fetus' head is pushed and molded to fit into the inlet to the pelvis. The reaction to this third matrix is variable. Some are active and some passive; some sense a maternal synergy and others maternal opposition; some are excited about the possibility of a new environment and others want to remain in the womb.



Lastly, Grof described the immediate post-birth experience as variable. There is the ideal of close, physical, and prolonged contact with the mother to "soothe away all the foul tensions that have arisen to perplex them, which they cannot understand" (Lake, 1978b). Along with the sense of confusion and bewilderment, there is the possibility of the sense of abandonment, loneliness, separation anxiety, and in the extreme, a sense of nothingness and dread.

CONCLUSION

As this very brief historical survey makes clear, the idea of a conscious prenatal experience and the notion that what happens to us in the first 9 months of life is critically important for the remainder of our days has been around for a thousands of years. As the rest of the book will attempt to make clear, the prenatal period may be the most important and influential period of time in our lives. The research evidence continues to mount that the prenatal period can no longer be ignored as psychological insignificant.

A hugely important theorist in prenatal psychology is the focus of our next chapter. Frank Lake was a British psychiatrist who wrote several books and many articles addressing what he believed was the profoundly important area of prenatal psychology.

Bibliography

- Allbutt, C. (1921). *Greek medicine in Rome*. London: Macmillan.
- Arey, L. (1954). *Developmental anatomy*. Philadelphia: W.B. Saunders Co.
- Bekoff, M., & Fox, M. (1972). Postnatal neural ontology. *Developmental Psychobiology*, 5, 323-341.
- Caraka. (1982). *The Caraka-samhita of Agnivesa*. (Vol. 1 Sarirasthanam), (P. Sharma, Ed. & Trans.). New Delhi: Chaukhamba Orientalia.
- Chamberlain, D. (1983). *Consciousness at birth: A review of the empirical evidence*. San Diego: Chamberlain Communications.
- Davies, G.S. (1973). Revolutions and cyclical rhythms in prenatal life: Fetal respiratory movements rediscovered. *Pediatrics*, 51, 965.
- da Vinci, L. (1945). *The Drawings of Leonard da Vinci*. A.E. Popham (Ed.). New York: Harvest Books.
- deMause, L. (1982). *Foundations of psychohistory*. New York: Creative Roots.
- Ellinger, T.U.H. (1922). *Hippocrates on intercourse and pregnancy*. New York: Schuman.
- Fabricius, H. (1942). *The embryological Treatises of Hieronymus Fabricius*. H.B. Adelman (Ed. & Trans.). Ithaca, N.Y.: Cornell Univ. Press.
- Fodor, N. (1949). *The search for the beloved: A clinical investigation of the trauma of birth and pre-natal conditioning*. New York: Hermitage Press.
- Fodor, N. (1971). *Freud, Jung and Occultism*. New York: University Books.
- Galen. (1968). *On the usefulness of the parts of the body* (Vol. 2). M.T. May (Ed.). Ithaca, N.Y.: Cornell Univ. Press.
- Freud, S. (1936). *Inhibitions, symptoms and anxiety*. London: Hogarth Press.
- Greenacre, P. (1952). *Trauma, growth, and personality*. New York: International Universities Press.
- Gupta, D., & Datta, B. (1988). The cultural and historical evolution of medicine and psychological ideas concerning conception and embryo development. In G. Fedor-Freybergh & M.L.V. Vogel (Eds.), *Prenatal and Perinatal Psychology and Medicine*, (pp. 507-534). Park Ridge, NJ: The Parthenon Publishing Group.
- Grof, S. (1975). *Realms of the human unconscious: Observations from LSD research*. New York: Viking Press.
- Grof, S., and J. Halifax. (1977). *The human encounter with death*. New York: E.P. Dutton.
- Hepper, P.G. (1989). Foetal learning: Implications for psychiatry? *British Journal of Psychiatry*, 155, 289-293.
- Jackson, R. (1988). *Doctors and diseases in the Roman empire*. Norman, Okla: Univ of Oklahoma Press.
- Lake, F. (1981). *Studies in constricted confusion: Exploration of a pre- and peri-natal paradigm*. Nottingham: Clinical Theology Association.
- Lake, F. (1978). *The significance of birth and prenatal events in individual, family and social life*. Nottingham: Clinical Theology Association.
- Lake, F. (1981). *Tight corners in pastoral counselling*. London: Darton, Longman & Todd.
- Lake, F. (1987). Primal integration work. *Self & Society*, 15, 167-173.
- Liley, A.W. (1991). The fetus as personality. *Pre- and Peri-Natal Psychology Journal*, 5, 191-202.
- Locke, J. (1956). *Essay concerning human understanding*. Chicago: Henry Regnery.
- McLaren, A. (1985). The pleasures of procreation: Traditional and biomedical theories of conception. In W.F. Bynum & R. Porter (Eds.), *William Hunter and the Eighteenth-Century Medical World*. (pp. 330-360). New York: Cambridge Univ. Press.
- Moss, R. (1987). Frank Lake's maternal-fetal distress syndrome: Clinical and theoretical considerations. In T.R. Verny (Ed.) *Pre- and peri-natal psychology: An introduction* (pp. 201-208). New York: Human Sciences Press.
- Parasara. (1968). *Parasarasmti*. D.S. Vasudeva (Ed. & Trans.). Benares: Chowkhamba Sanskrit Series Office.
- Patten, B.M. (1946). *Human embryology*. Philadelphia: The Blakiston Company.
- Plutarch. (1603). *Moralis* (P. Holland, Trans.). London: Hatfield.
- Rank, O. (1952). *The trauma of birth*. New York: Robert Brunner.
- Rau, H. (1982). Frühe Kindheit. In R. Oerter & L. Montada (Eds.), *Entwicklungspsychologie* (p. 131). München: Urban & Schwarzenberg.
- Ridgeway, R. (1987). *The unborn child*. London: Karnac Publishers.
- Rosslin, E. (1910). *Der Schwangern Frauen und Hebammen Rosegarten*. G. Klein (Ed.). Munich: C. Kuhn.
- Sadger, J. (1941). Preliminary study of the psychic life of the fetus and the primary germ. *The Psychoanalytic Review*, 28.
- Schindler, S. (1988). A new view of the unborn: Toward a developmental psychology of the prenatal period. In P.G. Fedor-Freybergh & M.L.V. Vogel (Eds.), *Prenatal and Perinatal Psychology and Medicine* (pp. 23-33). Park Ridge, NJ: The Parthenon Publishing Group.
- Soranus of Ephesus. (1894). *Die Gynakologie der Soranus von Ephesus*. H. Lüneberg (Trans.). Munich: C. Kuhn.
- Stone, L.J., Smith, H.T., & Murphy, L. (1973). The competence of Infants. In L.J. Stone, H.T. Smith & L. Murphy (Eds.), *The competent infant: Research and commentary*. New York: Basic Books.

- Susruta. (1954). *Sarirasthanam and Cikitsasthanam* . (A. Sastri Ed. & Trans.). Benares: Chowkhanba Sanskrit Series Office.
- Taft, J. (1958). *Otto Rank: A biographical study based on notebooks, letters, collected writings, therapeutic achievements and personal associations*. New York: Julian Press.
- Trotula. (1981). *Medieval woman's guide to health*. Beryl Rowland (Ed. & Trans.) Kent, Ohio: Kent State Univ. Press.
- Winnicott, D.W. (1958). *Collected papers: Through pediatrics to psycho-analysis*. New York: Basic Books.
- Winnicott, D.W. (1957) *Mother and child: A primer of first relationships*. New York: Basic Books.
- Winnicott, D.W. (1972). *The maturational processes and the facilitating environment*. London: Hogarth Press.