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THE BIRTH OF A MONSTROUS CHILD THROUGHOUT HISTORY: THE EXAMPLE OF ANENCEPHALY BETWEEN THE EGYPTIAN NEW EMPIRE AND THE 21ST CENTURY

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SUMMARY

THE BIRTH OF A MONSTROUS CHILD THROUGHOUT HISTORY: THE EXAMPLE OF ANENCEPHALY BETWEEN THE EGYPTIAN NEW EMPIRE AND THE 21ST CENTURY

Anencephaly is of special interest for the historical study of human behaviour after the birth of a monstrous child. Examples of anencephalic human births from Egyptian Antiquity to the present time allow us to create a history of teratology, revealing hiatuses in the medical and scientific interpretation of monstrosity that contrast to a relative continuity in the imaginary processes that accompany the birth of a monstrous child.

Introduction

Throughout the history of life sciences and medicine, the monstrous child has been described and analysed in the light both of imagination and of science. Whereas humans have always been imaginative in their attempts to explain the birth of a monstrous child, the science of the study of "monsters" only really appeared at the beginning of the 19th century. The term "monstrous child" suggests a child who, at birth, presents a major morphological defect incompatible with a survival of more

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than a few hours or a few days. Such monstrosity is always congenital: one is born monstrous, one does not become monstrous after birth. Monstrosity results, in the words of Etienne Wolff, from an embryonic failure (French "*raté*") the causes of which, when they are identifiable, are chemical, physical or genetic. Monstrosities, always lethal, differ from malformations and anomalies, both of which are compatible with life and represent a more or less severe handicap for the affected persons. Although nowadays the terms "monstrosity" and "monster" tend to be used to qualify criminal behaviour, the science of monsters – i.e. teratology – specifically deals with the study of the morphological defects occurring in the embryo, the foetus and the newborn child.

We have focused our present historical study on human anencephaly. The word "anencéphale" was first used by François Chaussier (1746-1828) and Nicolas Philibert Adelon (1782-1862) in their article "Monstruosités" in the *Dictionnaire des Sciences Médicales*[1]. These two authors created the word "anencéphale" (lacking a brain) in order to avoid the confusion, common at that time, with "acéphale" (lacking a head): "This monstrosity has been amalgamated with the first one, under the common name of *acephales*, but it seems to us more rational to distinguish between the two and to use the term *anencephale*, a word derived from ancient Greek, meaning *without encephalon*, or *loss of the encephalon*". Anencephaly is one of the most frequent human monstrosities (about 1/1,000 births), predominantly affecting females; it results from a failure of the cranial part of the neural groove to close (or sometimes from a secondary reopening of the cranial part of the neural tube)[2] in the human embryo at an early stage, approximately between days 24 and 26. Different teratological forms of non-closure of the neural groove exist, which lead to more or less severe neural tube defects, varying from a simple localised *spina bifida* to anencephaly with a more or less complete *spina bifida*[3]. A newborn anencephalic child usually

dies between the first hour and the first 3 or 4 days after birth; cases of exceptionally long survival, between 10 and 28 days, have been reported (4% of anencephalic deliveries)[4]. Throughout history, anencephaly has left a deep impression on the layman and has interested scientists; therefore, it is a specially interesting example for a societal and scientific study of normal humans confronted with the birth of a monstrous child.

The Mummified Anencephalic Foetus from Touna-el-Gebel

Accompanied by many scientists, Bonaparte embarked at Toulon on the 19th May 1798 for his campaign in Egypt (1798-1801), which opened the era of Egyptomania. In order to supply antique collectors and museums devoted to art or to science, antiquarians pillaged several historical sites that had witnessed the amazing and fabulous culture of ancient Egypt. One of these merchants, born in Trieste, described by Etienne Geoffroy Saint–Hilaire (1772-1844) as "a clever artist and an erudite antique dealer", Giuseppe Passalacqua (1797-1865), brought many objects back to Europe, including mummies, statues and papyruses. In 1826 Etienne Geoffroy Saint-Hilaire, founder of transcendental anatomy, examined zoomorphic mummies (Fig. 1) from the Touna-el-Gebel necropolis (about 570 B.C.), located at about ten kilometres from Hermopolis Magna. This necropolis, consecrated to the solar god Thot, contained many mummified animals. Among mummies of baboons *Papio anubis* and *Papio hamadryas*, the two species possibly representing the god Thot, the anatomist discovered the mummy of an anencephalic foetus. Together with other objects brought back by Passalacqua, this mummy was later exposed, in a recent cabinet in the rue des Filles Saint-Thomas in Paris (2ème arrondissement); it was still conserved in 2005, although in a rather poor state, in the museum of Egyptology in Berlin (Ägyptisches Museum und Papyrussammlung, today part of the Neues Museum Berlin). It is not exhibited. The mummy has been described by A. Erman in the

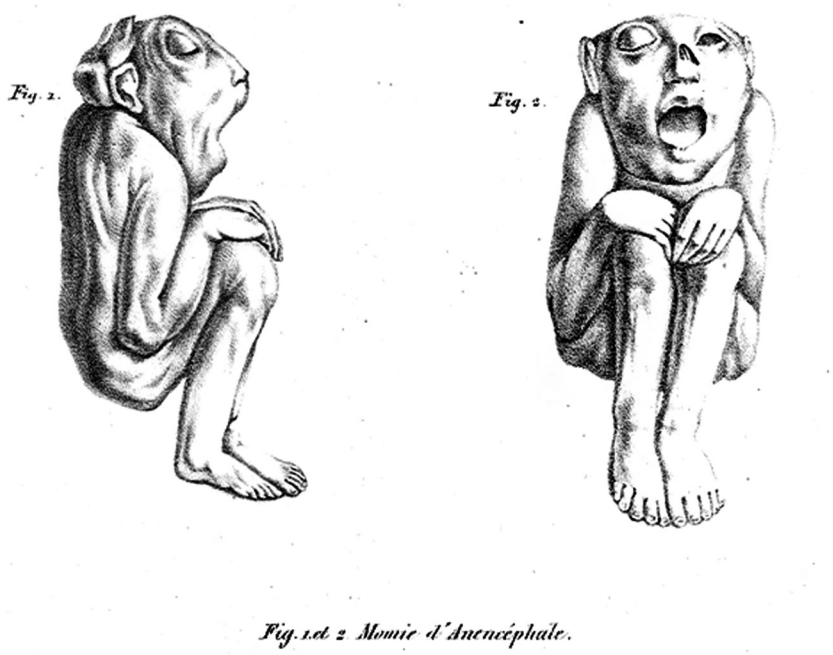

Fig. 1 - Zoomorphic mummies from the Touna-el-Gebel necropolis (about 570 B.C.)

catalogue of the Museum (1899)[5]. The presence of this mummy in Berlin is explained by the fact that Passalacqua sold his collection to Prussia and became curator of the Museum of antiquities in Berlin between 1828 and 1865[6]. The presence of this human anencephalic foetus among mummies of sacred apes has led to two interpretations.

Interpretations of the Human Anencephalic Mummy

The first interpretation refers to a physical resemblance between the anencephalic human fœtus and baboons: particularly, the "absence" of the forehead and the excessive length of the limbs in comparison to the trunk gives a simian appearance to the fœtuses affected by this encephalic dysraphy, another term used to describe anencephaly[7]. The

possible identity of this monster with apes not only led the Egyptians to assemble them in the same necropolis, but it also inspired some anatomists to validate this interpretation of their physical resemblance. Thus, a woman had given birth not to a true baboon but to a foetus whose shape resembled this animal representation of Thot. That the Egyptians did interpret the event in this manner can also be supported by the fact that the embalmers, following their usual technique, had extracted the "brain" through the nose, although the anencephalic fœtus, as its name indicates, does not have a developed brain. The fact that the Egyptian embalmers used this procedure indicates that they had interpreted the anencephaly as a normality, that of the baboon. On the other hand, this procedure may also have been carried out as a ritual routine part of the embalming process. It is possible to emit such hypotheses, although clearly difficult to prove them. In contrast to human mummies (foetuses, young children), which are in a lying position, it should also be stressed that this anencephalic mummy is in a seated position, mimicking the position of an ape. In addition, the neck of the foetus bears an amulet representing a baboon in the same seated position as the mummy itself. Such details seem to prove the identification of the Egyptian mummy with the holy ape. In 1880, Ernest Martin summarised this analysis:

> *Thus, one had embalmed and then buried a being born from a woman, but whose origin had been considered as bestial; it had been assimilated to an animal, but from a species which, in the Egyptian symbolic system, occupied the first rank and for which their religion commanded the pious conservation of the remains; to summarise in a word, it had been honoured as a sacred animal, it had been banished from human graves, but it had been kept in the necropolis of Hermopolis where posterity could later find it as the indisputable witness of the Egyptians' belief that human monstrous beings had a bestial origin*[8].

A second interpretation, resulting from the knowledge of antique Egyptian culture, breaks with the traditional views of Etienne Geoffroy Saint-Hilaire, "regularly quoted by the historians of teratology, such as his son Isidore Geoffroy Saint-Hilaire (1832-1836), Ernest Martin (1880) and, more recently, Jean-Louis Fischer (1991)"[9]. The Egyptologists have taught us that "the Egyptians' attitude towards children presenting congenital malformations greatly differs from that of other peoples through its ability to correct an anomaly symbolically in order to have it integrated in the world order". The general meaning of this is that the divinities in the world above can repair a defect that has appeared on earth. "Man is clay and straw, god is his builder. He destroys and (re)builds every day" (the Wise Sage Amenemope)[10]. This idea was to gain followers, and it is still used today as an argument by the anti-abortion leagues which refer to the biblical text: "See, let us return to the Lord; he has created the wound but he will heal us; he has stricken us, but he will bind our wounds. Within two days, he will let us revive ; on the third day, he will pick us up, and we will live in his presence" (Osee, 6-1). In their hypothesis, V. Dasen and A.M. Leroy also mention the integration in the Egyptian civilisation of handicapped persons, such as achondroplastic or harmonious dwarfs, hunchbacks and limpers, in order to lead us to accept the idea that monsters were in no way problematic for this antique civilisation. However, we have a doubt about this point: can we really believe that the Egyptians made no distinction between a viable dwarf and a non-viable anencephalic child? It is noteworthy that, in the Khmer civilisation, representations of dwarfs or hunchbacks (as statues) can be observed on the high and low reliefs of different temples (site of Angkhor), but there is never any monster. Conversely, roman abbeys display sculptures of teratological cases (cyclops, sirens, acephalic children); but such pictures are interpreted in the context of the history of "monstrous populations"[11]. As concerns the Egyptian anencephalic foetus, V. Dasen and A.M. Leroy

suggest that: "Not animal, not hybrid, not monster, the anencephalic child was greeted as an uncommon, incomplete being, comparable to the divine creatures from primitive times, who should be given to the god Thot in order to ensure his completion"[12]. Could the embalmers, who removed the "brain" from the anencephalic fœtus, have seen a normality in this being so difficult to classify: "Man or Beast?". This hypothesis, of Thot's having to finish off the monster in the beyond, could make sense if we were certain that the Egyptians considered the anencephalic child as an incomplete being. In other words, what kind of significance can we give to the concept of completion?

It is clear for the teratologist that the anencephalic child is a finished being in its anencephalic morphology and that he cannot rebuild any new normality: this is the rational interpretation. But we certainly recognize that the concept of an unfinished being is fully understandable in the spiritual context of the belief in a god (or God) who is attentive to the perfection of the beings he creates.

In the light of the foregoing discussion, a question comes to mind: why is there only one example of such a mummified monster, despite all the research and excavations that have been carried out in the Egyptian sites? Anencephaly is one of the most common human monstrosities and it is unlikely that, during the long historical period of their civilisation, the Egyptians did not come across other examples of anencephalic births, as well as other types of mostrosity (cyclops, acephalic children, sirens …). However, Pierre Charon reports that the anthropologist Jean-Louis Heim, during a mission in April 2005 to the Egyptian oasis Baharyia, observed a sacrum (1600 BC) presenting a *spina bifida* (minor form of neural tube defect, which is not usually lethal)[13].

It must be confessed that the fact that the anencephalic mummy found in Touna-el-Gebel remains unique does not really help us to reach a logical explanation to its presence in this sanctuary: because of its simian morphology or its spiritual fate?

The history of this anencephalic foetus is of special interest for the historians of medicine, since it illustrates the difficulty of interpreting certain facts. Whenever different hypotheses can explain a fact, the interpretation will naturally depend on the sensitivities of the analysts and many such examples have marked the history of sciences, and in particular the history of teratology.

Anencephaly, the Word and the Science

Until the 19th century, the human monster was interpreted as a freak of nature, marginal to the established order. One of the most frequently disputed questions was whether the Creator was playing with his creatures when he allowed monstrous births or whether they were due to other causes. The influence of the imagination of a pregnant woman on her foetus is one of the explanations proposed over the centuries for the birth of a monstrous child, or, indeed, for that of a perfect child[14].

As early as 1821, É. Geoffroy Saint-Hilaire published an attempt to classify "monstres acéphales"[15] (Fig. 2). The anatomist radically transformed the manner of studying and conceiving anatomy. He claimed that the anatomist should go beyond the limits of simple observation, he should dare to compare what seemed incomparable, compare humans with birds, fishes or reptiles; to summarize, build a new, transcendental anatomy, with which to establish the rules leading to the ultimate expression of the unity of the organic world[16]. Thus, monsters, considered until then as marginal, had to be included in this unity which characterizes living beings, since "all beings are formed following a same pattern, sometimes only modified in some of their parts"[17].

É. Geoffroy Saint-Hilaire participated in the scientific campaign in Egypt, during which time (1798-1801) he developed his idea of the unity of the structural plan and of the organisation of animals, including humans[18]. During the formation of this unit of plan, the brain plays

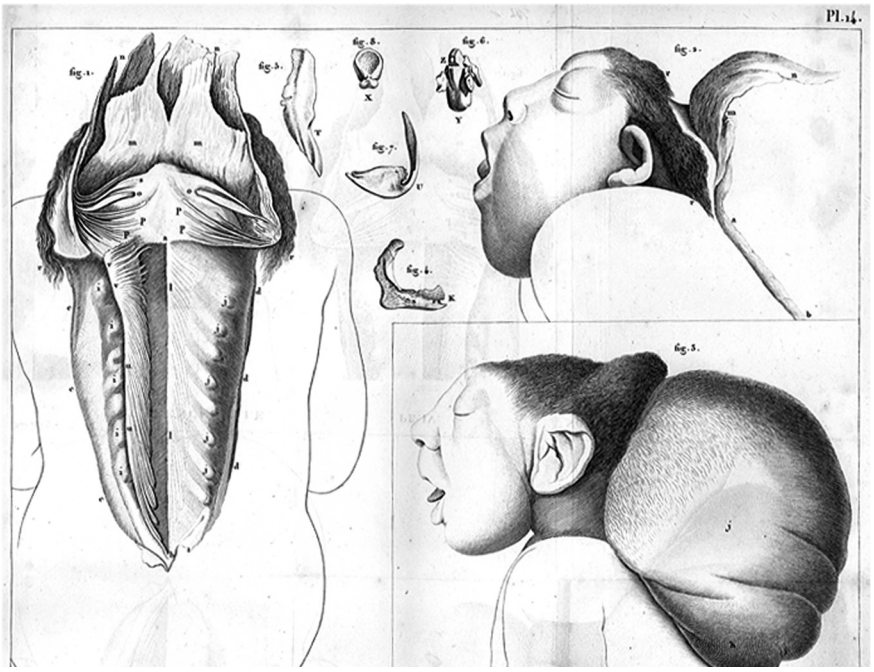

Fig. 2 - Geoffroy Saint-Hilaire's attempt to classify "monstres acéphales" (1820)

a fundamental role for Vertebrates: "The spinal cord is located within a bone envelope, called vertebral column, and the encephalon within the cranium. All the essential of the being is there"[19]. The brain possesses its own bones, the cranial bones, which are found in different animals, not with exactly the same shape or in the same number, but in the same location. This theory of analogues and the principle of connections are the bases of transcendental anatomy, stipulating that an organ "has rather been altered, atrophied, destroyed than being transposed"[20].

Anencephaly, the Unity of Plan and the Occipital Bone

Monsters were so called because they were displayed and it was difficult to consider them as normal. This definition is not wholly accu-

rate, since the precise definition of the monster implies a certain rarity. Ambroise Paré could define the whale as a monster, since it was rare for a Parisian surgeon barber: "Nous abusons aucunement du mot de monstre pour plus grand enrichissement de ce traicté; nous mettrons en ce rang la Balaine, et dirons estre le plus grand monstre poisson qui se trouve en la mer…"[21]. Be that as it may, comparison with a monster enables one to realise from what situation one has escaped and to wonder at the constructions of Nature. Here again, wondering is not a scientific approach per se, as some observers had already understood during the 18th century. For É. Geoffroy Saint-Hilaire, familiar with the culture of the Age of Enlightenment and pioneer in 19th century science, there is no reason to be astonished by a human monster: the monster belongs to the "*Unit of organic composition*". There is normality in the monster, since he obeys the laws of comparative anatomy; he represents a special anatomy which is in no way peculiar or marginal; conversely, in the eyes and the hands of É. Geoffroy Saint-Hilaire, the monster became a model justifying his statements which radically transformed the field of comparative anatomy.

When the author of the *Anatomical Philosophy* deals with anencephaly, he explains it scientifically: "It is known from comparative anatomy that oviparous animals have an upper occipital bone composed of two parts. It is amazing that the same division is also reproduced in the anencephalic foetuses of the human species"[22]. Indeed, oviparous animals possess two occipital bones, whereas viviparous animals and humans have only one, like the human anencephalic fœtus. Therefore, the anencephalic fœtus represents a lower degree of organisation, since, during its development, the organisation of the human "embryo" recalls animal forms situated between Invertebrates and the organic perfection of humans, only representing a stage leading to a more perfect being. Thus, like all other monstrosities, anencephaly corresponds to an "embryonic" stage. This monstrosity does not result from a disease, as suggested during the same period by

Béclard, but is the result of a developmental arrest. "Each acephalic child enters his nutritive life under determined conditions, which only come to an end, as he does himself, at the end of his intrauterine life; in this, he is a complete being, since he has contented himself with the conditions that led to his formation. He has lived for months longer than regular animals, for fewer months than others, but without having been able to live a second life, the so-called relational life, even if he had benefited from a more complicated organisation. What are days, or even years of life, for Nature? What are veritably our longest longevities compared to the essence of eternity?"[23].

For both anatomical and philosophical reasons, É. Geoffroy Saint-Hilaire created a classification of "acephalic" monsters, inspired by zoological nomenclature. This classification was based on the history of living beings leading from the animals to humans and not on nosology, which classifies and names diseases: monsters are not ill. This classification corresponds to the development of the subject in immediate time, i.e., the time during which the embryo develops, as well as to the development of the unity of organisation during geological time. The Linnean system of species classification imposes the declination in a chronological order: family, genus, species. É. Geoffroy Saint-Hilaire applied this by creating the family of "anomocéphalés" ("beings with anomalous heads") for acephalic monsters, then a series of genuses, including the genus "Anencéphale"; thus, the anencephalic mummy found in Touna-el-Gabel formed a species, *Anencephalus mumia,* (*anencephalus* corresponds to the genus and *mumia* to the species). This classification was ephemeral, but had the merit of opening the field of the science of monsters.

Naming and classifying human monsters resulted in their being endowed with a scientific identity within a science that did not even have a proper name as then. This name was given in 1830 by Etienne's son, Isidore Geoffroy Saint-Hilaire (1805-1861): teratology[24]. Monsters were subsequently described, then experimental

protocols (teratogenesis) were applied, in particular to the chick embryo, allowing the genesis of the monstrosities to be understood[25].

Anencephaly and Psychophysiology

Nicolas Vaschide (1874-1907), then Assistant Professor in the Laboratoire de Psychologie expérimentale, recently created (1900) at the Villejuif Asylum by Edouard Toulouse (1865-1947) and C. Vurpas, interne at the Asiles de la Seine, published in 1902 their *Essai sur la psycho-physiologie des monstres humains*; this work can be considered as the origin of the behavioural studies which are carried out to this day (2006) on yawning in anencephaly[26]. Psychophysiology, an experimental discipline, has retained the methods and the instruments of animal physiology in order to study the reactions of the body to experimentally induced behaviours: the animal model provides clues to the relations between psyche and physiology in humans. Consequently, the ability to make measurements on a human model, i.e. anencephaly, made it feasible to complement and to control previous results obtained from animal experimentation. How does the child devoid of a well-formed encephalon react to experimental stimuli? In addition, it has been stressed that the possibility to experiment on an anencephalic child was of great interest since the child had not been subjected to any surgical shock which could have interfered with the results of the experiment:

> *Although many experiments have been carried out on animals after the removal of their cerebral hemispheres, the situation is not the same for Humans. Whenever you study animals, the first difficulty is to distinguish between what is linked to the surgical shock from what is secondary to the experimental lesion*[27].

The anencephalic child on whom these experiments were carried out was born in February 1902, had a birthweight of 2,620 gr and lived for 39 hours, during which time some measurements were made, part-

ly following the experimental protocols developed by Étienne Jules Marey (1830-1904)[28]. The authors described the anencephalic child at birth: "What is immediately striking with him, is the absence of the cranial vault. Instead, there is an irregular, red, flaccid budding tumour, covered with scabs, presenting a deep basal groove, thus forming a true pedicle"[29]. They described irregular breathing, "bulging eyes" and all the features of anencephaly without *spina bifida*. Their general feeling after their first examination was: "As a whole, the head of this child is quite similar to that of a batrachian". In 1902, the anencephalic child did not resemble an ape, but rather a frog or a toad.

The experimenters tested the reactions of the anencephalic child, who was not totally insensitive. He reacted by movements "to pricks on the legs, the belly, to tickling on the sole of the feet, to the application of a warm body on the thigh, to the presence of a bottle of pure ammonia water"[30]. Conversely, the taste, the sense of smell, hearing and sight were "totally lacking" in this "monster". We will not insist any further on this report of 92 pages, apart from a statement made in the conclusion. Vaschide and Vurpas thought that anencephaly resulted from an infection. This was the movement of "pathological teratogeny", which refuted the idea of an embryonic process "of an arrest in development"[31]. According to these psycho-physiologists, the anencephalic child "thus becomes a human being, who only represents the product of a disease, and in no way a regressive step in a stage of human evolution or an arrest of the development during a more or less advanced period of fœtal life"[32]; this refers to the works of Ernst Haeckel (1834-1919), who had constructed an embryological demonstration of the animal origin of humans, summarised in this lapidary sentence "ontogeny is nothing else than a short recapitulation of phylogeny"[33].

Conclusion. Anencephaly: Between Science and the Irrational

It is an amazing story, that of the 16-year-old girl who gave birth to an anencephalic child in 1897. The fact was reported by Hilaire

Cuny[34], following a publication in 1943 by Dr Antoine Therre, chief of medicine at the Maternity Hospital in Vichy. This young "uneducated" girl lived in a caravan with her father and an ape, possibly an anthropoid, such as a chimpanzee, or a macaque. The girl becoming pregnant, her father was accused of incest, but a clinical examination of the girl's genitalia recognised her virginity, which ruled out any responsibility of the father. On the other hand, when she gave birth to an anencephalic child, the simian appearance of the infant led to the postulate that the ape living in the caravan had probably committed an act of bestiality. The reasoning was similar to that which may have confused Egyptian embalmers or led historians of teratology to this interpretation. The anencephalic child was born in 1897, but due to medical deontology the report was only published in 1943. The impossibility of any hybridisation between different species had been established at least since the time of Buffon, if not since the epoch of Aristotle, but for diverse reasons there have always been phantasms about the existence of hybrid beings[35]. The possible product of a relationship between an ape and a woman, or between a female monkey and a man, supports both societal beliefs and science fiction stories. In his report, although he recognised that hybridization between Humans and Apes is impossible, Therre did not, however, exclude a possible sexual relationship between the young girl and her ape, with which she "was living familiarly". Therre asked: how can this young, healthy girl, without any pathological background, give birth to this "simian-like" monster? Being unable to conceive the fertilization of a human ovule by a simian spermatozoon, Therre referred to the old hypothesis of the influence of the pregnant woman's imagination on her "foetus". The young girl, made pregnant by her father, thought obsessively of her ape, whose image was thus transmitted to her fœtus. In his time, Descartes gave a scientific dimension to this hypothesis and Malebranche largely contributed to its diffusion during the Age of Enlightenment. The power of this female

imagination, a concept invented by men, allowed many problems to be solved, and it could explain just as easily the birth of a monstrous or handicapped child, or the appearance of a birth mark, as the birth of a "black" child from a "white" couple[36].

Another explanation of this birth was given in 1957 by Louis Bounoure, professor at the Faculty of Sciences in Strasbourg. He believed that this anencephalic child could have resulted from gynaegenesis: he favoured the theory of an act of bestiality and suggested that a spermatozoon from the ape had activated the feminine oocyte, but without any participation of its genetic pool either to fertilization or to embryogenesis. Bonoure insisted on the fact that the ape would have to be a macaque "animal small enough to have been able to achieve an effective intercourse with his mate without leading to a visible defloration"[37], another hypothesis which here again rules out any responsibility of the father.

In this story, the anencephalic child from Vichy – long thought to have been totally forgotten – has been unearthed and presented for discussion on "Google France". Its presence on the web is partly linked to the fact that some biotechnologies developed in the field of procreatics have resulted in the production of chimeric embryos, part human part animal (rabbit, cow) for potentially therapeutic purposes[38]. For ethical reasons, such embryos have not been allowed to complete their embryogenesis, but the fact that such hybrids can be obtained alters, in some way, the peace of mind of the 21st century human regarding the impossible birth of hybrids, such as they could be imagined during Antiquity, Middle Ages or Renaissance. Web surfers are questioning this issue and even speculate about the imminent production of Minotaurs and other centaurs. However, if the concept of the chimera has a very precise meaning in embryology[39], the population of our cities by Minotaures and centaurs remains the realm of phantasms and fears generated by the image of the monster, either real, as in anencephaly, or linked to wonders,

tales and ancestral cultural traditions, the origins of which are lost in the depths of time.

Another interesting fact, linked to the world of the Egyptian culture, has been analysed by V. Dasen and can be extrapolated to Catholic theology. The Swiss website anencéphalie.info supports and advises pregnant women whose echography has led to a diagnosis of anencephaly. This website, the spirit of which seems to be closer to that of anti-abortion leagues than to family planning services, recommends that these women continue their pregnancies to term, since all the anencephalic "children" "react to our love", because "love is given and received by the heart, without any necessity to have a complete brain". At birth, the anencephalic child is dressed up, and many photos are taken (some of which are presented on the web site), for instance the mother alone with the anencephalic child or together with the father, a sister or a brother; it is also advised to take prints of the palms of the hands, of the soles of the feet, of the lips … A precise ritual is proposed in order to fully integrate the anencephalic child within the family. Some mothers testify … One mother believes that it is an ordeal sent by God. The site's support to the mothers is mainly limited to biblical quotations, like that of Osee, Jesus renders a normality to the sick and to "unclean souls" (Luc 6-18 et 21-18, also see Saint Augustin, *The city of God,* book XVII). The quotation of the Wise Sage Amenemope (1,200 BC) is in continuity with the biblical citations presented in the 21st century as a support to the birth of a monstrous child, giving hope that the anomaly will be repaired after death. Much scientific and medical information about anencephaly and anencephalic children is currently available, and some is indeed presented on the Swiss web site. But science has limits for certain ideologies and is not always sufficient to console: confronted with the birth of a monstrous child, belief in the unbelievable rejymktains a healing dimension in the human mind.

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