



# The conjoined twins of Löwen

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This paper discusses an unusual etching of unlike-sex conjoined twins of the synccephalus type dated 1547. The authenticity of the case is discussed in terms of the biological plausibility of such twins and in the light of mediaeval understanding of the twinning process. Unlike-sex synccephalic twins may occur as a result of dispermic fertilisation, or be an erroneous depiction of an asymmetrical anomaly of the external genitalia of a like-sex pair, mimicking the genitals of the other sex. On the other hand, the Löwen etching conforms with mediaeval beliefs that conjoined twins are divine punishment and therefore were used for ecclesiastical and perhaps commercial purposes. The historical context of the drawing, in which the relation between religion, media, and medicine satisfied the eagerness of the public for curios of Nature, is no longer valid. Thus the Löwen etching opens a window to the past from which modern medicine can be appreciated. *Twin Research* (2000) 3, 185–188.

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## Introduction

In 1547, a handbill illustrating conjoined twins was produced in Löwen (Figure 1). A free translation of the accompanying title, in German Gothic script, reads as follows. 'This present miraculous childbirth with two bodies under one head, four arms and with two hearts etc occurred in Löwen in the Niderlandt, 8 miles from Antdorff, nearly 100 miles from Nürnberg, to a woman called Margaretha, on Maundy Thursday 1547. The name of the child's father is Anthony Hefftmacher, citizen thereof, who donated the child(ren) Conrad and Kätchen to the godly citizens of Nürnberg for fair compensation. And the said father took the child's two hearts and kept them as a souvenir. The child lived for four hours, and thereafter soon passed away...'

The verse below this etching reads: 'The child described above had died so that God may improve this world. He let him see the day, only that we may repent and become pious. That is really fearful. So a terrible stratagem must be reckoned with which demands a penalty for sins. Before God, who sees them always.... As always God makes according to his will, mostly hidden and in silence, an unnatural human image that He may pass justice. Because from the said woman were born two infants' bodies, born with all their tender limbs, whose abdomen grew together, otherwise all their limbs loose and free, of whom on farewell one should vow to improve. And may God help us through His Son.'

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Figure 1 The Löwen etching showing synccephalus conjoined twins of different sex

During the sixteenth century, many popular and anonymous as well as famous artists (eg Albrecht Dürer) produced numerous illustrations of conjoined twins. It seems that many of them did not see the malformation and based their drawing on a description. Nonetheless, most of the drawings are vivid and detailed. Moreover, the remarkable accuracy enables one after four centuries to form a diagnosis of the malformation. In that respect, it is quite strange that the artist of the Löwen etching introduced a gross mistake by drawing unlike-sex conjoined twins.

There can be two attitudes to this incredible drawing: either accept the description as authentic, or consider the image fraudulent.

### The Löwen conjoined twins: authentic?

The etching depicts conjoined twins, with one head, one neck, and two fused thoraces (four nipples). Below the level of the thorax, the twins are separated (ie, separate umbilical structures) and, as seen from the perspective of the etching, are turned somewhat medially. The origin of the upper limbs is not clear; however, the etching shows left–right orientation of the arms to the front and back of the conjoined twins. Since the twins died 4 hours post-partum, their posture is certainly imaginary. We also know that there were two hearts in the conjoined thorax. Since all known conjoined twins are monozygotic, the main rejection of the genuineness of this case is the unequivocal illustration of the different sex of the twins.

Using the Guttmacher and Nichols classification of conjoined twins,<sup>1</sup> this pair belongs to the Tetra anadidyma class (single in the upper portion of the body and double below). Specifically, the description most likely represents a type between the dipygus and syncephalus varieties, although neither is perfectly depicted by the etching and its legend. According to Edmunds and Layde,<sup>2</sup> anadidyma pairs comprise 8.7% of all conjoined twins, including the craniopagus (6.2%) and syncephalus (2.5%) types. Thus, because the dipygus type is extremely rare, the handbill most probably describes a case of syncephalus.

Spencer<sup>3</sup> has reviewed more than 500 cases and discussed the centuries-old question of fission or fusion as the underlying mechanism of conjoined twins. She found no known embryologic process by which conjoined twins can be formed by fission but firm evidence to support fusion in all cases. She comments: 'whether the fusion occurs between embryos on one embryonic disc or on two is of no consequence since they are all mono-ovular'.

Mono-ovular twins, however, may be of different sex, as a result of dispermic (polar body) twinning.<sup>4</sup> Indeed, Bieber et al<sup>5</sup> documented a chorangiopagus (acardiac/normal twin) pair in which the dispermic component of the twins was confirmed by finding different paternal HLA haplotypes in each twin. Thus, if the fusion theory is accurate, one may speculate that the proximity of the ovum and its first polar body after dispermic fertilisation may have caused a parasitic conjoined twin of dissimilar sex.

An alternative explanation for the presumably different sexes in the Löwen etching may be an asymmetrical anomaly of the external genitalia of like-sex pair, mimicking the genitals of the other sex.

Finally, the two errors, namely separate umbilical cords and incorrect orientation of the arms, may suggest that the artist never saw the case and therefore the etching of unlike-sex conjoined twins may represent a true case of syncephalus in which the features were not depicted accurately.

### The Löwen conjoined twins: fraud?

The Löwen etching was created at the beginning of the Renaissance. In spite of the growth of humanism, the Renaissance continued to nurture superstitions left over from the Middle Ages, and therefore one must appreciate it in the context of the medieval contribution to the theory of twinning.

One of the most prominent contributors to medieval medical learning was Doctor Universalis, Albert the Great (Albertus Magnus, 1192–1280).<sup>6</sup> Albert suggested, when discussing the category of 'monsters due to abundance of matter', that the abundance and division of sperm in the womb – the causes of twinning – is induced by the movements of the female during intercourse. Albert added that if division of the sperm is not completed, the twins will be conjoined, a suggestion that predated by two centuries the earliest documented case of conjoined twins.<sup>7</sup> Albert's theory was based, in part, on Avicenna's view on the factors responsible for the generation of twins: the impulses of the semen and the circumstances that contribute to the female sexual orgasm. Thus it is no wonder that a follower of Albert, John of Jandun, commented that sometimes the division of sperm is incomplete, in which case a creature with two heads or four limbs will result. To avoid such a result, 'it is dangerous that the female moves during sexual intercourse in the way prostitutes are reputed to do, because if at such a moment they were to conceive, they could generate an awful two-headed monster.'<sup>6</sup>

One of the first important medical books on the subject was written by Ambroise Pare, the most

famous surgeon of the sixteenth century. In his book, *Of Monsters and Prodigies*,<sup>8</sup> Pare listed 11 causes to explain the generation of single and double monsters. His second cause (translated into the English of the day) ‘...that God may either punish mens wickednesse... because parents sometimes lye and joine themselves without law and measure...’ and his third cause ‘an abundance of seed and overflowing matter’ recapitulate the ideas expressed by Albert the Great and John of Jandun, during the thirteenth and fourteenth centuries, respectively. Pare added sketches including an ischiopagus pair delivered near Paris, a thoracopagus pair delivered near Angers (10 July 1572), and a dicephalus dipus dibrachius pair delivered in Sarzano, Italy (5 March 1514).

Taken together, the footnote to the Löwen etching conforms with the notion that conjoined twins result from divine punishment ‘So a terrible stratagem must be reckoned which aims at a penalty for the sins...’.

The etchings could be used for various purposes – scientific documentation of an actual case (as in Pare’s book), clerical (a reminder that sinners are eventually punished), and as a means to make profit. Pare wrote: ‘In 1475 were born in Italy, in the city of Verona, two girls united at their loins, from their shoulders to their thighs. Their parents being very poor, they displayed their daughters in several towns of Italy, in order to raise money...’. Again, this notion conforms with the legend of the Löwen etching that reads: the father (Anthony), a citizen of Löwen, ‘donated the child ... to the godly citizens of Nürnberg for fair compensation...’. Thus, the rich inhabitants may have produced the flyer for its pure financial value.

## Comment

The unsolved mystery of the twinning process has been used for many centuries for non-scientific purposes. In particular, conjoined twins were considered among the most bizarre malformations that were abused to convey religious beliefs.

The perspective of more than 400 years and current understanding of the twinning process seriously questions the authenticity of the Löwen illustration of conjoined twins.

The historical context of the drawing, whereby the reciprocity between religion, media, and medicine satisfied the eagerness of the public for curios of Nature, is no longer valid. Thus the Löwen etching opens a window to the past from which modern medicine can be appreciated.<sup>9</sup>

Exhibiting malformations for profits persisted well into the twentieth century. Hence, the handbills that

were quite popular at that time are strikingly similar to present day popular media and circuses, portraying monsters and prodigies.

Conjoined twins were discussed not only by Christianity. The medieval Cabala, an esoteric Jewish theosophy that crystallised during the thirteenth century, was concerned with knowledge about the nature of the divine world and its hidden connections with the world of creation. Indeed, the creation of Eve (Genesis, 2:21–3) has aroused much interest among Cabala scholars. ‘And the Lord God caused a deep sleep to fall upon Adam...and he took one of his ribs, and closed up the flesh instead thereof. And the rib... made he a woman, and brought her unto the man...’. The Cabalistic discussion explicitly suggests that Adam and Eve were conjoined twins (Hebrew: *du-parzufin*), fused side by side (rib, *zela* in Hebrew means also side). After the separation, it was no wonder that Adam said ‘...This is now bone of my bones, flesh of my flesh...’. These views suggest that Cabala scholars believed that conjoined twins (such as Adam and Eve) may be of different sex. A woodcut by Michel Wolgemuth appearing in *Liber Chronicarum* (by Hartmann Schedel, Nürnberg, 1493) depicts the creation of Eve as a separation procedure of ischiopagus twins.<sup>10</sup>

Finally, although we no longer believe that female movement during sexual excitement is implicated in twinning, we are still blind to the real cause. The Löwen etching teaches us how little have we accomplished in almost half a millennium.

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