

Hartsoeker's Homunculus Sketch from *Essai de Dioptrique* ^[1]

By: Lawrence, Cera R. Keywords: Homunculus ^[2] Preformationism ^[3] Sperm ^[4]

This [embryology](#) ^[6] image is a pencil sketch by [Nicolaas Hartsoeker](#) ^[7], published as part of his 1694 French-language paper entitled *Essai de Dioptrique*, a semi-speculative work describing the sorts of new scientific observations that could be done using magnifying lenses. *Dioptrique* was published in Paris by the publishing house of Jean Anisson. The image depicts a curled up infant-like human, now referred to as a homunculus, inside the head of a [sperm](#) ^[8] cell. This sketch is important to [embryology](#) ^[6] because it is one of the most illustrative examples of preformationism, a theory of generation stating that each future member of any given species exists, fully formed though miniscule, within the gametic cells ([sperm](#) ^[8] or eggs) of its parents. This theory was popular among naturalists in the eighteenth century.

Details of the image illustrate Hartsoeker's concept of how the homunculus exists in the [sperm](#) ^[8]. The tail of the [sperm](#) ^[8] in the sketch is attached to the homunculus at the stomach, indicating Hartsoeker's speculation that the tail may become the fetal [umbilical cord](#) ^[9]. The sex of the homunculus in the image is impossible to determine, as it is folded up to hide its genitals. The homunculus's cranium is large and prominent. The head of the [sperm](#) ^[8] is proportionately much larger compared to the tail of the [sperm](#) ^[8] than one actually observes under a [microscope](#) ^[10], though this detail was not meant to reflect the appearance of the actual [sperm](#) ^[8]. Hartsoeker commented in the text that it was difficult to get the sizes correct.

Hartsoeker did not claim in the text that he actually observed the homunculus. In the caption of the image, Hartsoeker wrote that this is what we might see if we could peer inside the skin of the [sperm](#) ^[8]. It is not entirely clear if he really meant that one would see, under a [microscope](#) ^[10], a perfectly preformed person in minute detail, or if one would see something with rudimentary form which could grow to become recognizably human. Hartsoeker refers only to *petit l'enfant*, 'the little infant,' or *le petit animal*, 'the little animal.' The term homunculus was not used by Hartsoeker in this text or by any other preformationist of the time, and may not have been coined for this usage until F. J. Cole's 1930 [Early Theories of Sexual Generation](#) ^[11].

Hartsoeker's homunculus sketch has become iconic of spermist [preformation](#) ^[12] theory. The image appears in virtually every textbook on the history of [embryology](#) ^[6], with Hartsoeker generally cited as the originator and main proponent of the idea that the [sperm](#) ^[8] contains a preformed miniature being, though some texts give Anton Leeuwenhoek the honor. The image, along with Hartsoeker's writing on the subject of spermist [preformation](#) ^[12], influenced all of the naturalists who adopted spermism in the eighteenth century, among them [Jean Astruc](#) ^[13], [Hermann Boerhaave](#) ^[14], and the philosopher-mathematician [Wilhelm Gottfried Leibniz](#) ^[15].

A number of derivative, adaptive works of art have been made using the elements of Hartsoeker's sketch. An example is 'The [Homunculus](#) ^[5], Then and Now?', a cartoon by [Lauri Saxen](#)

[16] drawn in 1973 which places the Hartsoeker homunculus image alongside a drawing of uncoiling DNA inside a [sperm](#) [8] cell, comparing the modern idea of [genetic determinism](#) [17] to the old theory of preformationism. The drawing also appears in 1969 as a symbolic detail of the tarot card ?The Hermit? in the Thoth Tarot Deck, designed by Aleister Crowley. This use by a non-scientist in a non-[embryology](#) [6] work underscores how pervasive the imagery of Hartsoeker?s sketch has become since its publication.

Because it is so clearly drawn and visually represents exactly what preformationism implies?that there is a miniature person inside the [sperm](#) [8] cell?this image is and will likely remain very important in [embryology](#) [6] as the essential illustration of spermist preformationism. It is compelling even today because of its simplicity, and because it unmistakably communicates what the illustrator intended. The image itself has become more famous than its creator, Hartsoeker.

Sources

1. Needham, Joseph. *History of Embryology*. New York: Abelard-Schuman, 1959.
2. Pinto-Correia, Clara. *The Ovary of Eve* [18]. Chicago: [University of Chicago Press](#) [19], 1997.
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4. Van Cittert-Eymers, J. G. ?Hartsoeker (or Hartsoecker), Nicolaas.? *Dictionary of Scientific Biography* 6: 148?9.

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