

**William Harvey (1578-1657)**

***Exercitationes anatomicae, de motu cordis & sanguinis circulatione.***

**Roterodami: Ex officina Arnoldi Leers, 1660.**

**Rare QP101 .H36 1660**

Although best known for this work on the circulation of the blood, Harvey was also an important early embryologist. He refuted the theory of spontaneous generation, the idea that living creatures could arise from inanimate materials. He also compared the reproductive anatomy of several animals and traced the development of chicken embryos within the egg. Harvey ascribed to the theory of epigenesis, but he points out many errors in Aristotle's thinking. Ironically, he gave rise to the ovist camp of the preformationists by coining the phrase *Ex ovo omnia* (from the egg, everything), to convey his idea that all animals have eggs at some point in their reproductive process. Harvey's work laid a foundation for the modern science of embryology.

**Antoni van Leeuwenhoek (1632-1723)**

***Opera Omnia, seu arcana naturae, ope  
exactissimorum microscopiorum detecta...***

**Lugduni Batavorum: Apud Joh. Arnold. Langerak,  
1719-1730.**

**Rare Vault QH9 L4 1719**

Leeuwenhoek discovered sperm in semen by means of a microscope in 1677. At first he thought they were animalcules, the term used at the time for one-celled organisms such as amoebas and protozoa. Later, Leeuwenhoek and others adopted the view that a pre-formed embryo in the shape of a tiny human must be inside each sperm cell, and this is what developed into a fetus.

**Lazzaro Spallanzani (1729-1799)**

***Dissertations Relative to the Natural History of  
Animals and Vegetables.***

**London: Printed for J. Murray, 1784**

**Rare QH 306 .S7313 1784**

A Catholic priest and intensive scientific researcher, Lazzaro Spallanzani was one of the last proponents of ovism. He was best known during his lifetime for providing a conclusive refutation of the theory of spontaneous generation, the idea that living creatures could arise from inanimate material, such as the belief that flies were born from mud. Spallanzani was particularly interested in reproduction, and his experiments included the first artificial insemination of a viviparous animal (a dog, in this case) and the first *in vitro* fertilization (of frog eggs).

**Wilhelm Friedrich von Gleichen-Russwurm (1717-1783)**

***Dissertation sur la generation, les animalcules spermatiques, et ceux d'infusions.***

**Paris: De l'imprimerie de Digeon, An VII [1799]**

**Rare Folio QL 966 .G5514**

Gleichen-Russwurm was a biologist who worked primarily on plants, but in this publication, he compares the sperm cells of various animals.

**Jan Swammerdam (1637-1680)**

***The Book of Nature, or, The History of Insects...***

**London: Printed for C. G. Seyffert, 1758**

**Rare Folio QL 362 .S97 1758**

Swammerdam is considered one of the founders of preformationism, the idea that embryos develop from tiny preformed versions of their adult bodies. Interested in both insects and human reproduction, Swammerdam drew parallels between the two by dissecting insect eggs, larva, and human reproductive organs. Swammerdam argued that all species come from eggs, and he was among the first physicians to realize that human ovaries produce eggs, which he claimed to have seen himself.

**Marcello Malpighi (1628-1694)**

***Opera omnia, seu, Thesaurus locupletissimus  
botanico-medico-anatomicus...***

**Lugduni Batavorum: Apud Petrum Vander Aa,  
bibliopolam, 1687.**

**Rare QH9 .M34 1687**

With Jan Swammerdam, Malpighi is one of the founders of preformationism. He believed that embryos develop from tiny pre-formed versions of themselves. Malpighi studied chicken embryos with a microscope and published the results in *De Formatione de pulli in ovo* in 1673, where he suggested that structures such as the heart and blood vessels exist at every stage of development - at some stages, they are just too small to see. Malpighi's diagrams and illustrations of embryonic development were well regarded in his time.

**Charles Bonnet (1720-1793)**

***Oeuvres d'histoire naturelle et de philosophie.***

**Neuchatel: S. Fauche, 1779-1783.**

**Rare QH9 .B66 1779-1783**

Working primarily on insects, Bonnet discovered parthenogenesis, or clonal asexual reproduction, when he isolated an aphid to see whether it could reproduce on its own. The isolated aphid eventually produced numerous offspring. Bonnet, however, took this as evidence of ovist preformationism, claiming that offspring existed pre-formed in the female reproductive system. Although he was wrong about embryology, Bonnet's work on observation and experimental design laid foundations for modern biology.

**Samuel Thomas von Soemmerring (1755-1830)**

***Icones embryonum humanorum.***

**Francofurti ad Moenum: Varrentrapp et Wenner,  
1799.**

**Health Sciences Library Rare Book Room**

**WZ260.S697i 1799**

Anatomist Samuel Thomas von Soemmerring was the first to try to describe a chronology of the development of embryos in the first five months. Working from embryos that had been aborted, miscarried, or discovered as part of an autopsy of the mother, Soemmerring was able to illustrate a process of gradual development that negated preformationist views.



**Rene Descartes (1596-1650)**

***L'homme, et vn Traitté de la formation du foetus.***

**A Paris : Chez Jacques Le Gras, au Palais, à l'entrée  
de la Galerie des Prisonniers, MDCLXIV, [1664]**

**Rare Vault QP29 .D44 1664**

Rene Descartes argued for mind-body dualism: the idea that the soul and the body have entirely separate and distinct natures. Descartes thought of the body as a living machine, and he claimed that all biological processes could be explained in entirely material and mechanical terms. This mechanistic philosophy greatly affected the development of modern science and medicine, as it attributed disease and the inner workings of the body to interactions of matter such as chemicals or tissues rather than to evil spirits or humors.

Descartes' understanding of how the body worked in material terms was very different from ours today. He believed the development of birthmarks and deformities were related to the science of optics. Explaining how light and images enter the eye, Descartes goes on to say, "And I could add here, how the traces of these ideas travel through the arteries towards the heart, and thus ray out in all the blood; and even how they can sometimes be determined by some of the mother's actions, and be imprinted on the members of the child who is forming in her womb." In Descartes' view, even looking at the wrong thing while pregnant could harm the fetus.

**Adriaan van den Spiegel (1578-1625)**

***De formato foetu liber singularis...***

**Francofvrti : Impensis & Cælo Matthæi Meriani  
bibliopolæ & Chalcographi, typis Casparis Rotelii,  
1631.**

**Rare R128.7 .S64 1631**

Adriaan van den Spiegel was born to a medical family in the Low Countries and studied medicine at the Universities of Louvain, Leiden, and Padua. He, like William Harvey, studied under the successor of Andreas Vesalius, Hieronymus Fabricius, and the renowned anatomist Guilio Casseri. *De Formato Foetu* was published posthumously with the help of his son-in-law, the physician Liberale Crema. Crema obtained nine copperplate engravings that had been commissioned by Casseri for another publication and he incorporated them into *De Formato Foetu*. The book was a major contribution to understanding the basic morphology of the developing embryo.

**Louis Francois Luc de Lignac (1740-1809)**  
***A physical view of man and woman in a state of marriage.***

**London : Printed for Vernor and Hood, 1798.**

**Rare HQ19 .L613 1798**

Little is known about Lignac's personal life except that he was a surgeon, as noted on the title page of this work. Lignac wrote this work on the physical aspects of marriage to further what he believed was the ultimate conjugal goal: to produce children. This work provides advice on how to best reach that goal, including considerations of the parents' temperaments and diet. "The air, the aliments, the passions, the manners, and prejudices," Lignac writes, "have all an influence on the infant confined in the womb of its mother."

***The works of Aristotle : in four parts. Containing I.  
His complete master piece...***

**London : Printed for, and sold by all the booksellers,  
1790.**

**Rare PA3894 .A2 1790**

This book, written by an anonymous author sometime in the seventeenth century, was the most popular manual on sex and reproduction for over two hundred years. It marked the gap between real science and folk medicine: it has no medical basis whatsoever, but it was often the only treatise on this subject available to the average person. *Aristotle's Master-Piece* treated of subjects such as how to have a male or female child, how the soul develops in the embryo, various pregnancy advice, and how to help a woman in labor. There is also a section on monstrous births, two of which are illustrated here. The treatise states, "Now a monstrous habit or shape of body is contracted divers ways, as from Fear, sudden Frights, extraordinary Passion, the influence of the Stars, too much or too little Seed, the Mothers strange Imaginations and divers phantasms which the mind conceive deform the body, and render the Child of an improper Shape..."

**Claude Quillet (1602-1661)**

***La callipédie, ou, La manière d'avoir de beaux enfans...***

**Amsterdam, et se trouve a Paris : Chez Dupuis ... J.**

**Fr. Bastien ..., MDCCLXXIV [1774].**

**Rare PA8570.Q6 C3 1774**

Taking holy orders did not stop Claude Quillet from writing this poem in formal Latin about the joys of the nuptial bed and how to conceive beautiful children. He explains how to find a suitable mate, what to eat and drink, and how to raise the odds of having a boy or girl. Quillet also discusses the importance of the maternal imagination and sight in producing beautiful children, noting that the mother-to-be should be careful what she looks at during pregnancy.

*Ye pregnant Wives, whose Wish it is, and Care  
To bring your Issue, and to breed it Fair,  
On what you look, on what you think, beware.*

He suggests pregnant women view classical art and paintings based on Greek and Roman mythology. After all, if a woman wants her son to look like Apollo, what better way to make that happen?

**Robert Johnson (b. 1720)**

***A New System of Midwifery in Four Parts: Founded on Practical Observations.***

**London : Printed for the author, and sold by D. Wilson and G. Nicol ..., 1769.**

Prior to the eighteenth century, childbirth was women's business. Men could be (and were) prosecuted for even attempting to be present at a birth. However, in the seventeenth century, male surgeons began to move into the profession of midwifery, calling themselves man-midwives and offering access to new technology: forceps. William Smellie was one of the most famous of these man-midwives, and Robert Johnson was his student. Johnson wrote this obstetrical treatise with an eye to scientific observation. Here, he illustrates a process of gradual development that negates preformationist views.

**Nicholas Malebranche (1638-1715)**

***Father Malebranche his treatise concerning the search after truth*, translated by T. Taylor.**

**London : Printed by W. Bowyer for T. Bennet [etc.],  
1700.**

**Thomas Moore Johnson Collection B1893.R33 E5  
1700**

Malebranche was a priest whose life was changed by reading Descartes' *Traite de l'Homme*, which inspired him to devote himself to a life in search of truth through the Cartesian method. Malebranche published his results in 1674 and 1675 as a two-volume work. One of the chapters treats of the connections between the mind of a woman and her unborn child; Malebranche argues that although their souls are separate, their minds are as closely linked during pregnancy as their bodies are.

*The Infants see what their Mothers see, they hear the same Cries, they receive the same Impressions of Objects, and are agitated with the same Passions.*

Malebranche reasons that since fetuses are still forming, it stands to reason that these experiences have a greater impact on the fabric of the infant body than they do on that of the mother.

**Johann Caspar Lavater (1741-1801)**  
***Physiognomy, or, The corresponding analogy  
between the conformation of the features, and the  
ruling passions of the mind.***

**London : H.D. Symonds, 1783?**

**Rare BF843 .L3**

Johann Caspar Lavater was a writer and was particularly interested in the field of physiognomy, a pseudoscience which claimed that a person's character and personality were revealed in his or her physical appearance. Lavater based much of his work on that of the well-known scholar Giovanni Battista della Porta, whose work drew parallels between the appearance and character of humans and animals. In this work, Lavater includes several anecdotes related to maternal imagination, including this rather disturbing story:

*A lady of Rheinthal had, during her pregnancy, a desire to see the execution of a man, who was sentenced to have his right hand cut off before he was beheaded. She saw the hand severed from the body, and instantly turned away and went home, without waiting to see the death that was to follow. This lady bore a daughter, who was living at the time this fragment was written, and who had only one hand. The right-hand came away with the after-birth.*



**R. Stéphany**

***Sauvons les bébés par l'allaitement maternel.***

**[France?] : Bureau des enfants, Croix-rouge  
américaine, [between 1910 and 1919?]**

Before and immediately after World War I, the American Red Cross estimated infant mortality in France to be alarmingly high: over 80,000 infants under 12 months of age died each year. After the war, the Red Cross mounted a “Save the Babies” campaign that established child health clinics, playgrounds, and courses for women on parenting, nutrition and hygiene. This poster specifically promotes breastfeeding.

The goal of the campaign was to relieve suffering, but the Red Cross also believed that its efforts to save the babies would transform European society. Happy, healthy, well-nourished children would grow into stable, hardworking adults who would be less inclined to go to war than their parents had been.

**Jean Jacques Rousseau (1712-1778)**

***Emile, ou, De l'éducation.***

**Londres: 1780-1781.**

**Rare LB511 1780**

A revolutionary philosopher, Jean Jacques Rousseau overturned much of the received wisdom on the care and education of children in the eighteenth century. One of his most famous works, *Emile*, outlines the education of a fictional boy. Rousseau believed that men were inherently good but were corrupted by society, so the goal of raising boys was to allow them to live close to nature as possible, following their natural inclinations and studying as their interests dictated. They should never be given books or forced to learn.

Girls, on the other hand, should be taught to be servants of men. Rousseau believed that women's physiology pre-determined them for lives as wives and mothers. His curriculum for girls was as follows:

*To please, to be useful to us, to make us love and esteem them, to educate us when young, to take care of us when grown up, to advise, to console us, to render our lives easy and agreeable; these are the duties of women at all times, and what they should be taught in their infancy.*

**William Cadogan (1711-1797)**

***An Essay upon Nursing, and the Management of Children, from Their Birth to Three Years of Age.***

**London: J. Roberts, 1750.**

**Rare RJ101.C3 1750**

William Cadogan was a medical doctor at the London Foundling Hospital, an orphanage for abandoned babies. He published this book based on his work with the foundlings, in 1748. In it, Cadogan advocated breastfeeding for at least a year, unrestrictive clothing, and plenty of play time for children, anticipating some of Rousseau's ideas on simplicity and natural living by over a decade.

Cadogan also dismissed much of the common knowledge of his day as "female superstition." On inherited diseases, he writes,

*...Complaints may be produced similar to those of the Parent, owing in some measure to the Similitude of Parts, which possibly is inherited, like the Features of the Face; but yet these Diseases might never have appeared, but for the immediate acting Cause, the Violence done to the Body.*

In other words, children could inherit a predisposition to disease from their parents, but not an actual illness. Cadogan was ahead of his time in this opinion and in much of his other work; his next publication, that gout was caused by an intemperate diet, was highly controversial at the time.

## **Anatomical Manikin**

**Ivory**

**German (?), eighteenth century**

**Health Sciences Library Rare Book Room**

Ivory manikins such as this one may have been used as educational tools by doctors and midwives. They allowed doctors to explain internal physiology to people who most likely had a vague concept of the functions of their internal organs. Most of the figures still extant today are pregnant females, which highlights the importance of educating women about their own bodies. The artist of this figure paid special attention to the fetus developing in the uterus, even connecting it to the womb with a small piece of thread to represent the umbilical cord.