

Fortunio Liceti (1577-1657)

Fortunio Liceti studied natural philosophy and medicine in Italy during the first half of the seventeenth century. Liceti wrote more than seventy works on a wide range of topics, including the human soul, reproduction, and birth defects observed in animals and human infants. In the seventeenth century, people commonly addressed birth defects using superstition and considered them as signs of evil, possibly caused by spiritual or supernatural entities. Liceti described infants with birth defects as prodigies and monsters to be admired and studied rather than feared. Liceti's works established monsters as a possible subject of scientific inquiry and served as models for the future study of birth defects, a field later called teratology. Liceti was one of the first scholars to attempt to systematically categorize birth defects based on their causes, including multiple causes unrelated to the supernatural.

Liceti was born on 3 October 1577 near Genoa, currently Italy, to Maria Fini and Giuseppe Liceti, a medical doctor. Liceti's mother was seven months pregnant and sailing to Rapallo, Italy, when she went into premature labor. Eighteenth century author Laurence Sterne wrote that Liceti was so small when he was born that he could fit in the palm of a hand. When Liceti's family arrived in Rapallo, Liceti's father constructed an incubator-like device with a thermometer and temperature control, similar to a device used in Egypt to hatch chickens. Liceti's parents kept him in that incubator until he grew large enough to survive without medical intervention. Liceti's father educated his son in natural philosophy and medicine.

In 1595, at the age of seventeen, Liceti traveled inland and continued his education at the University of Bologna in Bologna, currently Italy. There, he studied philosophy and medicine under physician Giovanni Costeo, and Federico Pendasio, an Aristotelian philosopher. Liceti later named his eldest son Giovanni Federico after those influential instructors. In 1600, Liceti received his doctorate in philosophy and medicine. Immediately following graduation, Liceti taught several classes in philosophy, including logic and physics, at the University of Pisa in Pisa, currently Italy.

Liceti based several of his ideas about medicine and philosophy on the works of Aristotle, a natural philosopher and scientist whose writings influenced modern Western thought. Liceti often referenced Aristotle's theories of causality, which attempted to describe the multiple causes of objects and beings. Those causes included reasoning about why objects and beings come into and out of the world, or what Aristotle called the processes of generation and corruption. Like Aristotle, Liceti worked with the assumption that knowledge about the natural world came from understanding the causes of that natural world.

From 1602 to 1618, Liceti produced several philosophical works about the potential Aristotelian causes of souls and the development of fetuses. In 1602, While working at The University of Pisa, Liceti wrote and published *De ortu animae humanae* (On the rise of the human soul). In *De ortu animae humanae*, Liceti speculated on how, when, and where different components of a human soul bound to a human fetus. In 1609, Liceti moved to the University of Padua in Padua, Italy, to accept a position to teach philosophy. In Padua, Liceti wrote and published *De perfecta constitutione hominis in utero liber unus* (On the complete process of human development in the uterus). In that work, Liceti discusses the development of a fetus based on its causes. While Aristotle had hypothesized that the creation of a fetus was dependent on male seed, Liceti argued that both male and female seed participated in creating the fetus. Liceti used those ideas to theorize about how a child could inherit similar physiological components to its parent.

Liceti used his studies of Aristotelian philosophy and theories about fetal development to speculate on the potential causes of monsters. At that time, people feared monsters and considered them as

signs of evil and as divine consequences of immoral acts or vengeful spirits. Monsters were often featured in ballads and stories for children. According to Alan Bates, a physician and medical historian, most scholars did not consider monsters worthy of study. Despite the status of the subject, in 1616 Liceti wrote and published the first edition of *De monstruorum causis, natura et differentiis* (On the reasons, nature and differences of monsters), a chronologically ordered catalogue of monsters from antiquity to the seventeenth century. Those monsters included infants who exhibited birth defects.

In *De monstruorum*, Liceti systematically categorized and theorized about the causes of monsters. He wrote that monsters were rare and admirable, and that their causes, the reasons they came into the world, were worthy of study and consideration. Liceti included monsters that modern readers understand as fictitious, like dog-human and bird-human hybrids. Liceti also included monsters that modern readers understand as infants with abnormal birth features, like conjoined twins and hermaphrodites, or infants with sex characteristics of both males and females. Liceti provided non-supernatural explanations for several phenomena in the book, opposing the idea that the causes of monsters were always spiritual, as scholars hypothesized at the time. He cited a narrow or compressed uterus, where infants develop, as a potential cause for monsters. Liceti noted that complications with the placenta, an organ that connects a fetus to its mother's uterus so that the fetus can take up nutrients, as another possible cause of monsters. Bates states that the first edition of Liceti's *De monstruorum* was not widely read and suggested that one of the reasons that the book lacked popular appeal was the low academic status of the study of monsters.

After the first publication of *De monstruorum*, Liceti continued to write about human souls, bodies, and monsters. In 1618, Liceti wrote a text in which he supported the theory of spontaneous generation, or the idea that life could emerge from decomposing plant or animal matter in which parts of the human soul remained. In 1619, Liceti was elected into the *Accademia dei Ricovrati*, later Galilean Academy in Padua, which was an academic society originally consisting of professors at the University of Padua. In 1634, Liceti published a second edition of *De monstruorum causis, natura et differentiis, Libri Duo* (On the reasons, nature and differences of monsters, Second Edition). Unlike the first edition, *Libri Duo* (Book Two) included greater than seventy copper-plate illustrations by the artist Giovanni Battista Bissoni. Those illustrations were originally engraved on copper plates and then copied on paper with ink. The illustrations depicted monsters that readers today understand as fictional, like mermaids and centaurs. The illustrations also included infants with birth defects, such as cases of cleft lip, a condition where the upper palate or lip creates an opening to the nose, *diprosopus*, or the duplication of facial features, and of a cyclops, which is a person born with one eye, two pupils, and no eyelid. According to medical historians Longo and Reynolds, the illustrations contributed to the larger readership of the second edition.

Although Liceti's most popular work was about monsters, he wrote and published many works in a broad array of disciplines during his academic career. Bates estimated that during the course of Liceti's academic career, he produced at least one book a year. In 1637, a more senior professor died and Liceti was not promoted to the empty position, so he left the University of Padua. He returned to the University of Bologna and taught philosophy. In 1645, Liceti went back to the University of Padua, where he taught the theory of medicine. During his time at Padua, Liceti corresponded several times with astronomer Galileo Galilei about sunlight, the moon, reflections, and atmosphere.

From 1640 to 1650, Liceti wrote and published seven different volumes of work in which he answered questions from publicly famous individuals on a variety of medical topics. In the fourth volume of that series, released in 1647, Liceti wrote a reply to William Harvey, a physician who had published an account of blood circulation in the human body in 1628. Liceti posited that Harvey's theory was false, and provided a detailed Aristotelian argument on what he believed was the correct, though ultimately inaccurate, course of blood circulation. Additionally, throughout his career, Liceti produced multiple texts on gems, rings, and their potential meanings. Bates noted that Liceti tended to write about publicly popular topics in medicine and biology, like spontaneous generation and the benefits of long periods of fasting, or not eating food. Bates claims that because Liceti often argued for the theories that later proved false, his scholarly reputation ultimately declined.

Liceti is most commonly cited by scholars and artists in the twentieth and twenty-first centuries for his work on monsters. Liceti brought anatomical defects, particularly defects present at birth, into

popular social discourse with his descriptions of monsters. According to Bates, Liceti is influential because he asserted that monsters could and should be studied, explained, and systematically categorized. Historians agree that, with his work, Liceti helped establish the field of teratology, the scientific study of birth defects. In 1936, François Houssay, a scholar, republished the illustrated edition of *De Monstruorum* in Paris, France at the height of the surrealist art movement. The movement encouraged the use of myth and imagination to create new forms of artistic expression.

Liceti died on 17 May 1657. He was buried in the church of the Dominican Fathers in Padua. Though the church was later demolished, Liceti's grave marker was preserved and is held in the Civic Museum in Padua.

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