In medieval university teachings based on the philosophy of Aristotle, the prominent position of human beings, as compared to animals and plants, was firmly assured by their intellectual capacities. According to the Aristotelians, these capacities were governed by the rational or intellective soul occupying the highest rank above two other kinds: the nutritive or vegetative soul and the sensitive soul. As the principle of those intellectual capacities, the “intellect” (nous in Greek and intellectus in Latin) and the rational soul were often used synonymously and interchangeably, although the former could be conceived only as a main faculty of the latter. Thus thought and other intellectual acts such as reasoning and judgment were described in terms of the rational soul or intellect before the appearance of a modern conception of mind and intelligence.1

As for the origin of the intellect in human beings at birth, there is a remarkable passage in Aristotle’s embryological treatise, Generation of Animals, 2.3: “The intellect alone comes from the outside.”2 This passage might suggest the intellect’s separated status from the body, which is hard to reconcile with Aristotle’s definition of the organic soul, as established from a hylomorphic perspective in his treatise On the Soul, 2.1.3 Although its real meaning is still debated by modern scholars, this passage was often used in the Renaissance to confirm the intellect’s external origin and its
insertion into the organic body of the human being. It also offered an aid in defending the privileged ontological status of the rational soul in line with the Christian doctrine of the human soul’s immortality.\textsuperscript{4}

In this chapter I would like to address the question of the origin of the soul and the intellect in human and animal generation, as it appeared in medical debates of the sixteenth and early seventeenth centuries. How did this issue affect the traditional boundary firmly established between human beings and animals? How was Aristotle’s passage used in this context? To answer these questions, I will focus on the embryological discussion of three representative figures of diverse geographical, intellectual, and confessional backgrounds: Jean Fernel of Paris, Jacob Schegk of Tübingen, and Daniel Sennert of Wittenberg.

Jean Fernel

French physician Jean Fernel (1497–1558) was one of the most influential medical authors of the Renaissance. His teachings exerted a considerable impact on his contemporaries and later generations at least until the mid-seventeenth century.\textsuperscript{5} As for the nature of the soul, Fernel disagreed with the “naturalistic” or “physicalistic” interpretation of Galen’s idea advanced especially by Italian medical humanists such as Nicolò Leoniceno (1428–1524). According to this interpretation, the soul and the body are destructible at death. Calling upon Renaissance Platonism, Fernel tried to present another image of Galen that could easily be harmonized with Christianity. The chief fruit of his endeavor was the dialogue \textit{On the Hidden Causes of Things} (\textit{De abditis rerum causis}) (Paris, 1548).\textsuperscript{6} In this work he advocated the quest for the “divine” (\textit{to theion}) by which he signified something superelemental, that is, something lying beyond the order of the four traditional elements (fire, air, water, and earth) and their forces.\textsuperscript{7}

To demonstrate that the soul’s substance is simple, incorporeal, and immortal not only according to Galen but also according to Hippocrates, Fernel argues that the latter proposed a “divine opinion” on the soul’s origin at the beginning of the treatise, called \textit{On Fleshes}: “I should say nothing about heavenly and sublime things, unless to the extent that human beings and other animals that live and are begotten on earth have their principle and origin there; and that the soul comes from heaven.”\textsuperscript{8} Fernel relies on a Renaissance translation that differs from the modern reading at a crucial point by emphasizing that the soul comes from heaven. Using this
lesser-known passage with a cosmological dimension, he tries to advance that Hippocrates advocated the celestial origin of the soul. To reinforce this argument, Fernel appeals to a passage of Galen’s work, which seems particularly Platonizing:

To remove all chance of uncertainty, please listen to what [Galen] states divinely in the book *On Uterine Conception*: “A soul is a downflow of the universal soul, descending from the heavenly region and capable of knowledge; ... abandoning earthly things, it always aims at the highest points of all; having a share of heavenly divinity and gazing quite often over the heavenly place, it takes its stand beside the governor of all things.” This clearly shows that Galen’s opinion does not differ from that of Plato and Aristotle at all; they have spoken with one voice in confirming that our soul is simple, incorporeal, and immortal.9

Fernel defends the celestial origin of the soul in this way. For him something celestial lies beyond the realm of the elements and must be indestructible. So the soul must be immortal.

This immediately begs the question: How can the immortal soul reside in a perishable body? According to Fernel, the soul cannot be destroyed despite its attachment to the body by a certain union called “the chain of bonds” (*vinculum nexus*). It is not the soul itself but only this chain that can be damaged at death. Fernel identifies these bonds with the spirit and its heat. When an extreme defect of the body causes them to perish, the soul, being set free, abandons the body.10

Once the celestial origin of the soul is confirmed both for human beings and other animals, Fernel’s next step is to show the divine nature of spirits in living beings.11 To this end, he classifies spirits into three categories: 1) the spirit of God; 2) the spirit of nature; and 3) the spirits in natural beings. Having established the agreement of the ancients as to the superior kinds of spirit, he turns to the inferior one and tries to show that the spirit and its heat are celestial. Can anything celestial exist in bodies? Fernel answers that many people made an error precisely here by claiming that anything celestial is external to the body. Living beings at death must lose the cause of their life’s functions. According to Fernel, it is not the soul but only the spirit’s heat that is extinguished. Thus this heat must bear a super-elemental nature as the author of life’s functions or of life itself in the body of living beings.12
After all these discussions, Fernel explains what he understands by the term “divine.” Following Aristotle’s words in his *Generation of Animals*, 2.3, he defines it as “anything that corresponds to the element of the stars.”¹³ This special element must be the fifth element, the incorruptible and eternal aether. For Fernel anything divine, including the soul and the spirit, belongs to the celestial realm.

What is important in this discussion is the following point. Even if human beings and other animals are clearly distinguished in their ontological hierarchy, Fernel did not impose a sharp boundary on their generation, unlike the traditional university teachings. He emphasized the soul’s celestial origin for all living beings on the basis of a cosmological passage from Aristotle’s *Generation of Animals*. Paradoxically, this strategy diminished the importance of Aristotle’s other axiom, “the intellect alone comes from the outside,” from the same treatise, and perhaps explains why this axiom is not featured in Fernel’s work.

**Jacob Schegk**

An accomplished humanist and a moderate Lutheran, Jacob Degen alias Schegk (1511–1587) first taught philosophy and later medicine at the Protestant University of Tübingen for several decades.¹⁴ His lectures were popular and attracted many students coming from reformed lands. Even though Schegk is mainly remembered as a commentator of Aristotle, he was also deeply interested in medical issues. Among other writings he composed the embryological treatise *On the Plastic Faculty of the Seed* (*De plastica seminis facultate*) (Strasburg, 1580). This work mainly deals with the Galenic doctrine of formative power, which was believed to reside in the seed of living beings as an agent responsible for their formation.¹⁵

Schegk’s theory of the plastic faculty became widely known among Protestant natural philosophers such as Daniel Sennert (1572–1637) and Johann Amos Comenius (1592–1670) in the early seventeenth century.¹⁶ Drawing on the same theory, William Harvey (1578–1678) developed his own idea of “plastic force” (*vis plastica*) in his epigenetic system. It is not only in the field of embryology but also in broad natural philosophy that the notion of plastic power came to play an important role. Applying it even to the formation of inorganic natural bodies such as minerals and fossils, Athanasius Kircher (1602–1680) provoked lively debates in the Republic of Letters.¹⁷ More importantly, Cambridge Platonists such as Henry More (1614–1687) and Ralph Cudworth (1617–1688) transformed this embryological idea into
their own doctrine of plastic nature. Aimed at explaining the whole organization of the created world, this doctrine held significant metaphysical and theological implications and attracted the keen attention of philosophers such as Leibniz. In this treatise Schegk also discussed the origin of souls at length. Contrary to Fernel, he retained a sharp boundary between human beings and other living beings. Let us examine the main line of his argument and try to extract the reason for his position.

Schegk first argues that among admirable forces observed in nature the “formative and plastic faculty” (facultas formatrix et plastica) is the most remarkable. It fashions from the raw and formless matter of seeds an animate body with well-formed parts. Schegk regrets that unlike Aristotle Galen did not acknowledge the existence of this kind of power, which is rational yet devoid of intelligence, as the principle of action in natural things. For him the plastic power produces its works for the sake of definite ends because, created by God, it imitates the Creator as if it were His hand and instrument.

Relying on Aristotle’s axiom “the intellect alone comes from the outside,” Schegk then clearly defends that only the human soul, which possesses the intellect, can be separated from the body. By contrast, the soul of other animals cannot exist independent of matter. In this connection, he notes, Plato recognized that eternal human souls come from the outside and are neither generated nor corrupted with the body because of the intellect’s nature. To explain the soul’s entry into the body, Schegk introduces the notion of the soul’s “vehicle” (vehiculum) and sums up the opinion of the ancients: Thanks to the soul’s vehicle, the human soul enters the body at birth and leaves it at death. Only the human soul’s vehicle is separable from matter, while the human soul itself is inseparably tied to this vehicle.

Schegk adds that the plastic faculty first achieves the organic body; then the soul enters this body to inform its formed parts. The relation between the plastic faculty and the soul is not clear yet. So he posits the following questions: 1) Does the plastic faculty become a part of the soul? and 2) Does, by a total dissolution, anything of its parts remain in the produced body? Schegk answers that Aristotle proved the dissolution of the plastic faculty by using the example of a coagulant, which perishes after curdling milk to produce cheese. Thus when the soul enters the formed body to animate it, the plastic faculty, disappearing by itself, is replaced by the soul.

What is important in Schegk’s discussion is that he perceives all nonhuman souls to be “generated,” that is, “drawn from the potentiality of matter” by the plastic faculty. This is the real meaning of the “generation” of nonhuman souls for him. By contrast, the case of the human soul is
different. He says: “For the human soul is not drawn from the potentiality of matter by the plastic reason-principle but is introduced into matter thanks to the intellect’s divine and immortal essence, which may be created but not generated.”24 According to Schegk, the ancients held the idea that the human soul exists before it enters the body and animates it after the introduction. He insists, however, that even if they postulated the preexisting, therefore noncreated, human soul, the doctrine of Creation must be defended by Christian philosophers. For this reason he affirms that the human soul does not receive its angelic and noble essence from the plastic faculty but directly from the Creator.

To clarify his discussion, Schegk enumerates four possible positions:

1) Human souls are eternal; they enter the body at birth and leave it at death (this view is in agreement with the ancients).
2) All souls were created simultaneously during the Creation of the world, although each of them enters its specific body later at a precise moment.
3) As the products of nature souls are continuously drawn out from the potentiality of matter by the plastic faculty.
4) Each soul is created by God’s supernatural potency at the same time as the body is formed by the plastic faculty.

Schegk clearly chooses the last option by denying that the human soul is drawn out from the potentiality of matter. Under the authority of the Bible, he argues that God forms nonhuman creatures by using the plastic faculty assigned to the seed, while for human beings God simultaneously creates the soul by Himself and forms the organic body by means of this plastic power. According to Schegk, God is the Creator of angels, whereas the human soul, which shares the angelic essence, is created as the “breath” (spiraculum) of the Creator and is not “produced” by the plastic power of nature. For him the everyday creation of the human soul is the ultimate and supreme action of God. It is true that the Creator attributed the primary task of forming the bodies to the plastic power of nature. But God does not cease to create human souls every day so as to show that the human being is not a “product” (plasma) of nature but the direct offspring of God. This human-centered theology is really noteworthy. Schegk concludes:

I believe that if philosophers had known the Creator God, they would have agreed with us and would not have said that [human] souls are contained in the seed and in the seminal liquid of the male [parent]
before they inform human bodies. In fact, denying the Creator God, or rather being ignorant of Him, they were forced to conclude that the human soul and its body are generated by the spermatic reason–principle at the same time, and that the human soul is not introduced from the outside but is drawn out from the potentiality of matter.\textsuperscript{25}

For Schegk the plastic faculty generates all nonhuman souls, while the human soul, endowed with angelic essence, has only God as its author. Indeed the human soul, or more precisely, its angelic intellect, cannot be generated through seminal propagation since it is something “born before” (\textit{progenes}) nature. It was necessarily created by the Creator God, who precedes it. That is why Aristotle’s axiom “the intellect alone comes from the outside” was fundamental to Schegk’s discussion.

\textbf{Daniel Sennert}

Daniel Sennert (1572–1637) was a professor of medicine at the University of Wittenberg, the cradle of Lutheranism.\textsuperscript{26} He has increasingly been drawing the keen attention of historians. Going beyond the traditional view of him as simply one of the first proponents of early modern atomism, a careful review of his entire work has begun. In the context of seventeenth-century “chymistry” (alchemy/chemistry) and corpuscular philosophy, his role as a major source for Robert Boyle (1627–1691) has been placed in a fresh light.\textsuperscript{27} Moreover, his theory of the soul, in which Aristotelian hylomorphism and Democritean atomism interact, has been the subject of recent studies. The relation between embryological preformationism and the idea of monads has made some specialists of Leibniz consider Sennert seriously as a key figure.\textsuperscript{28}

Sennert’s masterpiece \textit{Physical Memories} (\textit{Hypomnemata physica}) (Frankfurt, 1636) encompasses the cluster of issues raised by the intersection of matter theories and the life sciences in the early seventeenth century.\textsuperscript{29} His discussion on the origin of souls is in the fourth book. Against the doctrine of “eduction” (\textit{eductio}), according to which all forms, including souls, are drawn out from the potentiality of matter, Sennert affirms that souls are multiplied rather than produced. The defense of the “multiplication” (\textit{multiplicatio}) theory, along with the rejection of the eduction doctrine, is the leitmotif of his discussion.

Sennert first refers to a theory ascribed to Avicenna, which posits a superior celestial entity as the giver of forms, called “Colcodea.”\textsuperscript{30} According
to Sennert, this entity uses seeds as its instruments to produce the vegetative and sensitive soul, and when this soul informs the body appropriately, the rational soul is introduced from the outside without the aid of matter. Judging this theory metaphysical and unfounded, Sennert rejects it in his natural philosophy. For him although celestial causality promoted by this kind of theory is widespread, it should be taken as a remote cause. Even if this superior entity can be identified with the Creator God, the question here concerns generation and not the Creation, so the doctrine is false. After this preparation, Sennert turns to Fernel’s theory, according to which souls are introduced from heaven into matter once the latter is duly prepared. He estimates it unnecessary to draw souls out of heaven because God assigned the capacity of multiplication to living beings. He concludes that anyone who believes that souls come from heaven is both ridiculous as a philosopher and execrable as a Christian.31

Having thus rejected celestial causality in the generation of living beings, Sennert enumerates four major opinions. The first and second acknowledge the soul in the seed, while the third and fourth do not:

1) An external agent draws out the soul from the potentiality of matter, which is the seed.
2) A formative power is provided to the seed by the parent and produces the soul.
3) All seeds, including those of human beings, contain a soul from the beginning.
4) Only the human soul, also called “rational soul” or “intellect,” comes from the outside.

Sennert examines the first position linked to the eduction doctrine by placing Thomas Aquinas (c. 1225–1274) and the Jesuit writers in the group. Against this position he advances the idea that all forms can multiply just as is read in Genesis: “Be fruitful and multiply.”32 According to Sennert, only the first soul of each species was created by God in the Creation of the world. After that, the multiplication of forms is sufficient for the souls of all individuals that have existed, exist, and will exist.

Next Sennert addresses the second position, which is connected to Schegk’s theory of formative power. He estimates it unnecessary to posit the plastic faculty in the seed because this power is nothing but the soul. According to him, it is absurd that a certain formative power produces such a noble, divine, and superior substance as the soul.33 This power
cannot be the “faculty of the seed” but the soul itself or the “faculty of the soul in the seed.”

The third position, according to which the seed possesses a soul within itself, is the real position that Sennert wants to defend. To this end, he first explains the meaning of the term “seed”: “It should, however, be noted here that the name of seed is sometimes used in a broader sense, sometimes more strictly. In the broader sense the seed is construed as all that body which serves the propagation and generation of a living being. Taken strictly, by contrast, it is a very simple substance, or a certain spirit, in which the soul and the plastic force immediately reside, and contains within itself the Idea of the organic body from which it has fallen.” From this argument it is clear that the seed in Sennert’s mind is understood in the latter meaning and is identified with a certain “spirit” (spiritus). Thus, according to him, the soul resides in this vaporlike, material substance. He makes it clear, however, that the seminal spirit is not the very principal cause of generation but just the instrument of the soul. As for the common, visible entity, which is usually called the seed, it is merely the seed’s material cover.

In this connection Sennert criticizes Thomas Fienus (1567–1631), a professor of medicine at the University of Louvain. Fienus wrote several embryological treatises and expressed his doubt about the existence of such a material spirit in the seed. Sennert discards Fienus’s doubt by pointing out that chymical distillation can extract from the dry seeds of plants a material spirit that is highly flammable. In this way chymical explanations, rarely found in the embryological texts of the Renaissance, become important in Sennert. His idea of the spirit regarded as the “material cover” of the quintessential core of natural things was most probably influenced by the chymical tradition, which was developed under a strong influence of Paracelsianism.

As for the fourth and most widely accepted position, according to which only the intellect or rational soul comes from the outside, Sennert rejects it by affirming simply that the soul, once separated from the body, ceases to communicate with the body. For him it is thus unnecessary to posit a separate state of the soul from matter in natural philosophy. According to Sennert, who adopts the Galenic doctrine of double seeds, the human soul emerges in the fetus right after conception when the male seed and the female seed unite and are retained in the womb. Unlike those who maintained the gradual replacement of the vegetative soul by the sensitive soul and then by the rational soul which comes from the outside (he assigns this idea to Thomas Aquinas and his followers), Sennert acknowledges only
a single soul endowed with diverse faculties. According to him, human beings from the beginning have only one rational soul, which has diverse faculties such as vegetative, sensitive, and intellec tive ones and those that are transmitted through the seed. Remarkably, Sennert makes a radical break from the traditional doctrine of the external origin of the human soul.

**Conclusion**

Against the naturalistic or physicalistic interpretation of Galen’s con cep tion of the soul, which became popular among medical humanists in the first half of the sixteenth century, Fernel advocated the celestial origin of souls by making recourse to Renaissance Platonism in vogue in his time. His motivation was to defend the immortality of the human soul in line with Christianity. It is noteworthy that he emphasized the celestial origin not only for the human soul but also for all kinds of soul. Paradoxically, the gap between human beings and other animals became less evident in his embryological discussion, especially around the origin of the intellect. Aristotle’s axiom “the intellect alone comes from the outside” was consequently not featured in his discussion.

By contrast, Schegk placed the immediate origin of human souls in the Creator and established his theory of the everyday creation of human souls by God. In this process Aristotle’s axiom “the intellect alone comes from the outside” was so fundamental to his reasoning that the traditional gap between human beings and animals was strictly maintained.

Sennert, in turn, rejected both theories advanced by Fernel and Schegk, although they were popular in his time. To defend the doctrine of Creation from a Christian point of view, he advocated the theory of the creation of the first soul of each species and the consecutive “multiplication” (not creation or production) of souls. He clearly rejected Aristotle’s axiom “the intellect alone comes from the outside.” The traditional boundary established between human beings and animals no longer depended on this axiom in Sennert’s system.

Each of these three divergent positions intimately reflected the author’s intellectual and confessional background and was influential during the second half of the sixteenth century and the first half of the seventeenth century. The interpretation of Aristotle’s axiom “the intellect alone comes from the outside” as the intellect’s extrinsic origin seems very odd to the modern eyes. But it provided the fuel of lively debates on the kinship and difference between human beings and other animals during this period.
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