**Cesalpino on Sensitive Powers and the Question of Divine Immanence**

**Andreas Blank**

**Abstract**  Nicolaus Taurellus (1547-1606) developed a detailed critique of Cesalpino’s cardiocentric physiology, challenging the causal roles that Cesalpino ascribed to the heart, blood, vital spirits and vital heat in the origin of sensitive powers. He also rejected Cesalpino’s view that a cardiocentric physiology of sensation could be used as an analogy to explain in what sense the universe could be understood as being animated. The central point of Taurellus’s critique is that Cesalpino’s treatment of vital heat implies a theory of divine immanence. On first sight, this critique may seem to rest on a misinterpretation since there are passages in which Cesalpino describes the relation between the causal role of vital heat and divine causation as an analogy. However, Taurellus draws attention to some aspects of Cesalpino’s thought that have not found much attention from commentators: Cesalpino’s account of divine self-reflection as a principle of final causation inherent in animals, and his account of divine self-reflection as a principle of final causation inherent in the heavens.

**1. Introduction**

The origin of sensitive powers was one of the many issues in Cesalpino’s natural philosophy that the Altdorf-based physician and natural philosopher Nicolaus Taurellus (1547–1606) criticized in his *Alpes caesae* (1597).[[1]](#footnote-1) Apart from many concerns concerning physiological details, Taurellus argued that Cesalpino’s account of the role of vital heat in the framework of a cardiocentric physiology of sensation has theological implications that could be incompatible with the Christian doctrine of creation. In particular, Taurellus objected to what he understood to be Cesalpino’s conception of the divine intellect inherent in animate beings, both individuals living beings and the universe as a whole. On first sight, one may conjecture that Taurellus’s theological concerns rested on a misinterpretation of Cesalpino’s natural philosophy. In Cesalpino’s *Quaestiones peripateticae* (1571/1593) and *Daemonum investigatio peripatetica* (1580/1593), the relation between the causal role of vital heat in producing sensation and the causal role of the divine intellect in functioning as the first origin of motion is characterized as an analogy. Did Taurellus simply mistake a claim about an analogy relation for a claim about an inherence relation?

The question, of course, is what grounds the analogy relation to which Cesalpino was undoubtedly committed. Is it a mere (rather loose) similarity between causal functions of different entities? Or is it the conjecture that the same entity that is responsible for the first origin of motion is also responsible for the origin of sensation in animate beings? Taurellus’s interpretation may draw attention to aspects of Cesalpino’s natural philosophy that have not found much attention from commentators. One aspect is Cesalpino’s account of divine self-reflection as a principle of final causation inherent in animals. This account does not reduce to the stipulation of a causal relation between the divine intellect and the striving found in animals; rather, Cesalpino’s view that the divine intellect at the same time is the object desired and the entity that desires itself points toward a sense in which some divine activity can be said to be operative in animals. The other aspect is Cesalpino’s account of divine self-reflection as a principle of final causation inhering in the heavens.

I will proceed as follows. First, I will show that Taurellus’s theological objection is directed at one of Cesalpino’s arguments for cardiocentric physiology. Then I will argue that the use of analogical reasoning in *Daemonum investigatio peripatetica* leaves room for asking whether Taurellus has seen something significant. Subsequently, I will argue that the role that Cesalpino assigns in *Quaestiones peripateticae* to final causation in the origin of the vegetative and sensitive powers of living beings goes beyond the limits of analogical reasoning. Finally, I will argue that the same holds for Cesalpino’s account of how a single divine intellect animates the universe by animating the heavens.

**2. Sensitive Powers and Cardiocentric Physiology**

Cardiocentric physiology is built around the claim that the heart is the principal organ in sanguineous animals, in the sense that the proper functioning of other organs depends on some causal influence deriving from the heart, while the heart can continue to function well without an influence of the same kind deriving from other organs. One might conjecture that Cesalpino’s version of cardiocentric physiology is connected with his views concerning the circulation of the blood.[[2]](#footnote-2) However, as Andrew Cunningham has pointed out, Realdo Colombo (c. 1516–1559), whose discovery of the pulmonary circulation Cesalpino took up, maintained that the brain, not the heart, is the principal organ.[[3]](#footnote-3) Thus, the question of the principal organ was quite independent from specific views concerning the circulation of the blood. Rather, it involved questions concerning the causal role of theoretical entities such as vital heat in nutrition, growth and sensation.

To argue for cardiocentric physiology, Cesalpino took up several strands of thought from Aristotle. One of them is the argument that, because nutrition is due to the element of fire, and the heart is the origin of heat, the heart is the first organ to be nourished.[[4]](#footnote-4) Another strand is the argument that, because blood is the ultimate aliment, and in the development of the fetus appears for the first time in the heart, the heart is the organ from which the nutrition and augmentation of other body parts originates.[[5]](#footnote-5) Cesalpino also adopted Aristotle’s view that, in sanguineous animals, there is no sensation in any part that lacks blood.[[6]](#footnote-6) Like Aristotle, he explained this through the view that the sensitive soul is one actually and belongs to one part primarily[[7]](#footnote-7) because otherwise the sensitive soul could not judge the difference between several senses.[[8]](#footnote-8)

Going beyond Aristotle, Cesalpino developed a series of arguments of his own to support cardiocentric physiology. For present purposes, it will suffice to focus on the argument that triggered Taurellus’s objection that Cesalpino’s version of cardiocentric physiology leads to inacceptable theological consequences—the argument from the possibility of dividing lower animals into parts that all have vegetative and sensitive powers. Cesalpino argued that “animals that are less distinct, have a closer union of these vessels: this is why it happens that they can stay alive for some while, for they do not have distinct principles but rather principles that are diffused throughout the vessels.”[[9]](#footnote-9) Cesalpino maintained that some lower animals can be divided such that the separated parts have the same vegetative and sensitive powers as the whole animal. For example, if a worm is cut into pieces, all the vegetative and sensitive powers of the soul can be observed in each part that were observable in the whole, “as if they were inseparable from each other.”[[10]](#footnote-10) Cesalpino remarked that the persistence of the vegetative and sensitive powers of the entire animal in the separated parts also indicates an answer to the question of “how the eternal and the mortal are numerically one.”[[11]](#footnote-11) As he argued, from the experiences such as the division of a worm “it follows that in all bodies, together with a material form, there inheres an immaterial form …”[[12]](#footnote-12) And finally, he conjectured that this could be the sense of Thales’s saying (reported by Aristotle) that everything is full of Gods.[[13]](#footnote-13)

Cesalpino’s reasoning is certainly puzzling because it leaves out any of the intermediary steps that could have led him from observations about the persistence of sensitive powers in separate worm parts to the divine nature of an immaterial form inherent in bodies. Some, but not all of these steps could be filled in by considering how he takes up and modifies the late scholastic theory of sensible species. The question that the theory was meant to answer is the question of how sensible qualities can be represented (in different material media and in the states of the sensitive soul) without carrying the material substrate with them.[[14]](#footnote-14) There was a strong tendency to understand sensible species as immaterial entities that are capable of travelling through matter, thereby making their mode of transmission enigmatic; but there were also attempt at understanding them as modifications of material substrates (such as changes in shape and motion).[[15]](#footnote-15) Cesalpino distinguished material species inherent in the sensory organs from immaterial sensible species that allow the common sense to compare the impressions of the different senses. As he puts it, “[i]n an organ and a body, a species is received with quantity and divisibly, which is why it turns out that at the same time the same part of the body cannot sense contraries, such as light and darkness, heat and coldness.”[[16]](#footnote-16) Since we can observe in ourselves the ability to judge contrary sensible qualities, it is necessary to presuppose the existence of an entity that itself is indivisible.[[17]](#footnote-17) The role of immaterial sensible species for the workings of the common sense would explain why Cesalpino held that the persistence of sensitive powers in separated worm parts indicates the presence of an immaterial form in each part.

Still, it remains enigmatic why Cesalpino connected the idea of an immaterial form in sensitive beings with Thales’s saying that “everything is full of Gods.” The lack of argumentative connection at this place could indicate that what Cesalpino had in mind is merely analogical or metaphorical. This, however, is not how Taurellus understood the passage. Taurellus commented: “I wonder about Cesalpino’s imprudence: … What others have with the best judgement distinguished—God and nature—he dared to confuse.”[[18]](#footnote-18) For Taurellus, this is by no means a side issue because, in his preface to *Alpes caesae*, he makes clear that the main motivation of his critique of Cesalpino derives from theological concerns. In Taurellus’s view, what is problematic about Cesalpino’s physiology of sensation is that it implies that God is not separated from matter and, hence, is not understood as an efficient cause of things; rather, God is understood as their constitutive cause (*rerum causa constituens*).[[19]](#footnote-19) As Taurellus maintains later in the text, Cesalpino’s view amounts to nothing other than “to confuse the substance of God and of all other things in such a way that each thing in some respect is said to be God himself.”[[20]](#footnote-20) Did Taurellus simply misunderstand Cesalpino?

**3. Vital Heat and Analogical Reasoning in *Daemonum investigatio peripatetica***

On first sight, some aspects of the treatment of vital heat in Cesalpino’s *Daemonum investigatio peripatetica* could point in that direction.[[21]](#footnote-21) Cesalpino there discussed vital heat in the context of his discussion of the sense in which fever could be regarded to be something divine. In this context, he referred to Aristotle’s view that the heat of the fertile seed is not fiery but stands in an analogy to the heavenly bodies.[[22]](#footnote-22) Understanding talk about what is divine in fever from the perspective of this analogy may suggest that what Cesalpino has in mind in nothing other than an analogy between the causal role of vital heat in the production of fever and the role of the divine being in celestial causation. But consider how Cesalpino explained the analogy:

[V]ital heat is a body that is more divine than elements, although it is constituted by them; and rightly it corresponds to the element of the stars not only with respect to the fecundity, which it possesses from the intelligence that is contained in it, but also with respect to the immortality and purity of the subject.[[23]](#footnote-23)

My conjecture is that the “subject” mentioned Cesalpino is prime matter. This is suggested when he claims that sublunar bodies have an “eternal corporeal nature”[[24]](#footnote-24)—which cannot refer to the concrete material objects (that is, “secondary matter”) that undergo change, generation and corruption. If so, then one of the analogies that Cesalpino had in mind is the analogy between the Aristotelian conception of the eternity of prime matter and the Aristotelian conception of the eternity of heavenly matter. But there is an aspect that goes beyond the limits of analogical reasoning. Cesalpino connected his conception of prime matter with Aristotle’s view that, in all natural things, there inheres beauty.[[25]](#footnote-25) As he explained:

‘Beautiful’ is said with respect to the goal for whose sake nature acts, and whose origin is said to derive from the heavens. For this divine being that is eternal is by its nature always the cause of the best condition in contingent things. But that the first body that receives this divinity is prime matter, is evident from this: It is something that by its own nature strives for what is divine, good and desirable.[[26]](#footnote-26)

Hence, in Cesalpino’s both the source of the striving characteristic for prime matter and its object are described as being divine. And the same holds of the nature of prime matter itself: “What flows without motion and change from the divine essence is also something divine and immortal.”[[27]](#footnote-27)

There is a further aspect of analogical thought in Cesalpino’s discussion of vital heat. The comparative use of “being more divine” suggests that vital heat should not be regarded to be something divine without qualification. One important qualification results from the consideration that vital heat is described as being constituted by elements, which implies that there is a corporeal aspect to vital heat. In this respect, vital heat differs from the divine intelligence, which is described as being indivisible and devoid of extension.[[28]](#footnote-28) But, again, there is an aspect that seems to go beyond the limits of analogical reasoning. The causal powers of vital heat are described in a way that suggests that it cannot be reduced to the causal powers of elements and their composition. As Cesalpino put it, “because in the spirit or innate heat the animal power inheres actually, not in fire nor in other elements, this body is called ‘more divine’: for it actually receives the power of the divine intelligence …”[[29]](#footnote-29) What is more, the reception of a power from the divine intelligence does not seem to reduce to a causal influence. Otherwise, it could not be explained why Cesalpino speaks of the fecundity that vital heat “possesses from the intelligence *that is contained in it*.” Evidently, the containment relation goes beyond a causal relation, even though the nature of containment of the divine intelligence in vital heat is not further spelled out here. If so, then the analogy between the powers of vital heat and the powers of divine intelligence may be grounded in the presence of divine intelligence in vital heat.

**4. Sensitive Powers and the Origin of Substantiality in *Quaestiones peripateticae***

Of course, the passages from *Daemonum investigatio peripatetica* are puzzling. But they leave room for asking whether Taurellus may have been right when he ascribed a conception of divine immanence to Cesalpino. And Cesalpino seems to have been aware that more needed to be said. Immediately after the cited passages, he referred the reader to his account of the origin of multiplicity from the unity of the divine being developed in *Quaestiones peripateticae.*[[30]](#footnote-30) Apparently, he did not think that there is a tension between these two works but rather wanted them to be read in conjunction. In fact, the latter work offered a much more detailed discussion of the sense in which the divine intellect could be understood to be contained in vital heat.

It will be useful to start with the interpretation that Taurellus gave of Cesalpino’s views concerning the origin of multiplicity. Taurellus presented the following summary:

Because Aristotle taught that all the multitude of things arise from matter, Cesalpino has put down this great doctrine, namely, that there is a unique incorporeal substance. Because he neither wanted to make souls corporeal nor to admit their multitude, he maintained that they are parts of a unique incorporeal substance and stand in relation to multitude only with respect to their underlying matter.[[31]](#footnote-31)

Such a reading could be supported by Cesalpino’s view that the different ways in which things are distinguished from each other depend on the different ways in which things “participate in being,” that is, on the different ways in which things “descend from a unique substance.”[[32]](#footnote-32) However, Cesalpino was faced with the problem of specifying how the divine intellect could animate less perfect beings without thereby making the life of less perfect beings its final cause—the perfection of the divine intellect implies that it is the goal of everything but does not exist for the sake of anything.[[33]](#footnote-33) To provide a solution, Cesalpino invoked Aristotle’s conception of divine self-reflection. As Cesalpino noted, for Aristotle the divine intellect’s understanding “is a substance, for it is identical with what is understood, and it is the understanding of the understanding.”[[34]](#footnote-34) As Cesalpino argued, self-reflection leads the divine intellect to think everything that can be thought—hence, also to think of the multiplicity of possible substances that the divine intellect could animate.[[35]](#footnote-35) At the same time, because self-reflective thought originates from the divine intellect and has only the contents of the divine intellect as its object, it does not detract anything from the perfection of the divine being “in so far as it is the most perfect being, it distributes being to all others and confers perfection upon them: but in so far as it is understanding, it confers upon things the desire for perfection.”[[36]](#footnote-36)

How could the relation between the divine being and the desire for perfection found in natural objects be characterized? Cesalpino wrote about divine, “speculative” intellect:

The speculative intellect … is a substance that persists by itself, and is desirable not for the sake of any further being; it imparts perfection to those beings that by their nature are capable of desiring, and it does so not by acting in some way, or by introducing something into matter …, but rather by educing through its presence that form for which matter has an aptitude by its nature.[[37]](#footnote-37)

In this passage, Cesalpino distinguishes two ways of thinking about the relation between the divine intellect and the natural world. One way of thinking invokes the idea that God acts upon things that are external to the divine being. A special case of such action would involve introducing one natural object into another natural object (which are both external to God). Another way of thinking starts from the hypothesis of divine presence in natural objects and asks about the consequences that this presence has. Clearly, Cesalpino adopted the second way of thinking. As he put it: “Separate elements … do not contain actually this divine being, but only potentially, but mixtures contain it actually, and, for this reason, they are actually substances.”[[38]](#footnote-38) The relation of a divine being to mixtures here is characterized as a relation of being-contained-in, which confirms that what Cesalpino has in mind is not only a causal relation between a divine being and powers of the mixture but also a relation of inherence.

Interestingly, the causal role of a divine being that is actually present in the mixture that constitutes the body of a living being is described in terms of a concept widely used in early modern natural philosophy: the concept of *eductio*. This concept is built around the idea that complex material composites possess causal power that cannot be reduced to the causal powers of their constituents and the composition of these constituents.[[39]](#footnote-39) In contrast to other non-reductionist natural philosophers, Cesalpino does not believe that the occurrence of new causal powers is a basic feature of complex material composites that cannot be explained further; rather, he explains the occurrence of such new powers through the presence of the divine intelligence in living beings. Living beings thereby possess properties that are not the properties of the divine intelligence. In this sense, it is informative to speak of an analogy between the substance of living beings and the substance of the divine intelligence. At the same time, the striving for perfection found in living is identical with the striving characteristic of the divine intelligence. This is why living beings are substances only because they depend upon the substance of the divine intelligence.

Taken together, these passages suggest the view that a single divine intellect can be the origin of a multiplicity of natural powers not only because the divine intellect, through self-reflection, comprises an infinite complexity of thoughts, but also because, by animating material composites, the divine intellect brings forth new causal powers that cannot be reduced to the powers of elements. This is why Cesalpino held that there is more than one sense in which unity is the origin of multiplicity:

From what has been said it is clear how a single intelligence contains all the acts of understanding things, for it is like the measure of all things. However, it is evident that things relate to each other as acts of understanding do; hence, it is not impossible that a multiplicity arises from the one. This also becomes clear from the reduction of entities to the one and from the way in which the kinds of substances are described according to addition and subtraction … Hence, insofar as it is simply and as it is described with respect to the subtraction of all matter, there is a unique and simple substance.[[40]](#footnote-40)

Thus, one sense in which multiplicity arises from the one has to with the dependence of things on the divine understanding. A plurality of things comes about because there is a plurality of divine acts of understanding, to which the things correspond. Another sense in which multiplicity arises from the one has to do with the role of matter in bringing about plurality. This is the sense in which Cesalpino spoke of “addition” and “subtraction”: “adding” matter to the single incorporeal substance leads to a plurality of natural beings, “subtracting” matter from the plurality of natural beings leads to the single incorporeal substance. But if living beings are nothing but the divine intellect to which matter is added, then the active principle the brings about vegetative and sensitive powers cannot be anything other than the divine intellect. If so, then divine self-reflection itself is understood as principle of goal-directed activity inherent in living beings.

**5. Sensitive Powers and the Animation of the Universe in *Quaestiones peripateticae***

The same conception of divine immanence can be found in Cesalpino’s account of the animation of the universe. As Cesalpino believed, “it is reasonable to assume that the universe is animate, if the heaven is animate … for in animals, the soul is not necessarily in the whole body, but it suffices that it is in a principal part such as the heart.”[[41]](#footnote-41) Accordingly, “the universe is something organic, for it consists of similar parts that are in a certain way prepared to carry out some action: but the nature of organs arises only from the soul: for this is the being of the soul.”[[42]](#footnote-42) Taurellus was very much aware of this analogy and ascribed to Cesalpino the claim that the first mover is “a constitutive part of the heavens” (*coeli pars constituens*).[[43]](#footnote-43) This reading is closely connected to Taurellus’s already mentioned reading that, for Cesalpino, God is a “constitutive cause of things.”[[44]](#footnote-44)

The analogy between the animation of the universe through the animation of the heavens and the animation of the body through the animation of the heart plays a central role. Cesalpino’s analogy between how the divine intellect animates the universe by animating the heavens and how vital heat animates animals by animating their heart was meant to specify the sense in which a single divine intellect can be the origin of animation for a multiplicity of heavenly bodies (and thus to offer an alternative to the Aristotelian theory of a plurality of movers of heavenly bodies). This is how he explained why it is not necessary to multiply intelligences:

It is … as if we hold that the soul had many parts because it confers the power of sensation to many parts while, by itself, it is one and resides indivisibly in the heart, as Aristotle maintained. But that intelligences are many in this sense is not repugnant to the unity and simplicity of intelligence that we advocate. For as the same soul is called vision in the eye but hearing in the ear, so can the same intelligence, in so far as it moves the moon, be ascribed to the moon, in so far as it moves Saturn, be ascribed to Saturn, and so on.[[45]](#footnote-45)

According to this analogy, to animate the universe, the divine intelligence need not be present to all parts of the universe. It suffices that the divine intelligence be present to the heavens, which corresponds to the principal organ in sanguineous animals, as long as it is capable of bringing forth causal powers also in regions of the universe where it is not present. Cesalpino develops the analogy further by ascribing to final causation a role in the animation of the universe that is closely similar to the role that he ascribed to final causation in the animation of living beings. As he maintained, in order to be moved by final causation, the heavenly bodies must have the power of striving for the highest good since “what is loved, moves the heavenly bodies: but they could not desire and love it unless they understand the good itself …”[[46]](#footnote-46) Cesalpino’s suggestion seems to be that the divine intellect does not bring forth any separate act of understanding in an animate substance. Presumably, such an act of understanding would be diminished in perfection due to the matter constitutive of the individual. This, however, is not what Cesalpino assumed to take place. Rather, he held that “the highest and optimal good, which in the highest degree exists only as a single being, fills out everything with the desire for it, and what is simply good is good for each being taken individually without any contamination through matter or diminution of any essence.”[[47]](#footnote-47) If no diminution of essence takes place, it seems most plausible to assume that the understanding that underlies the striving of heavenly bodies is nothing other than the understanding of the divine intelligence. This reading is supported by how Cesalpino developed the analogy between the animation of living beings and the animation of the universe:

To think that what is moved and what desires and what understands is the same and in the same respect would be foolish, for even in animals, these do not happen with respect to the same part. Motion is perfected through the nerves and the joints; the appetite is located in the heart or its analogue; the power of sensation is located in the sensory organs, while the power of the mind is separate. Something similar has to be said with respect to the heavens. For there are three things: the body that is moved; the moving intelligence; and a third being through which it is moved, the appetite. What is moved, what desires, and what understands is the same being, but not with respect to the same parts or powers. Hence, motion inheres according to the nature of body, for this is moved primarily; it understands according to the intelligence, for this is the proper operation of the intellect that does not communicate with the body; but it desires according to the composite, for loving, hating and desiring belong to the composite consisting of soul and body.[[48]](#footnote-48)

This way of developing the analogy between the animation of living beings and the animation of the universe is interesting for two reasons: First, it supports the reading that the understanding that causes the striving of heavenly bodies is identical with the understanding of the divine intelligence. Second, it takes up Cesalpino’s view that the actual presence of the divine intellect in material composites “educes” new causal powers—the powers that are characteristic of an animate being. In one sense, thus, the powers of animate beings are not the same as the powers of the divine intellect. This is why it is informative to speak about an analogy between the causal role of the vital heat in an organic body, the causal role of the first mover in the heavens and the activity of the divine intellect considered in itself. But at the same time, the analogy is grounded on a claim about inherence. Vegetative and sensitive powers could not come into being without the inherence of the divine intellect in the vital heat. And the striving of heavenly bodies could not come into being without the inherence of the divine intellect in the different regions of the heavens.

Taurellus noted that Cesalpino’s characterization of the relation between God and the material world allows for two diverging interpretations, both of which, however, are in conflict with the doctrine of creation. One interpretation suggested by Taurellus has it that “things depend on the first being only insofar as these bodies are animate or substances. For [Cesalpino] maintained that each substance is a substance only through participation in the first being.”[[49]](#footnote-49) Taurellus observed that, for according to this line of thought, “neither prime matter, nor secondary matter—that is, a body that is not animate—depends on the first being. If this is the case, it is necessary *that, in order for there to be dependence on the first being, something must preexist that has actuality but is not animate by itself*.”[[50]](#footnote-50)

This is the first sense in which Cesalpino’s account of divine immanence could be incompatible with the view that the world is created. If prime matter (and hence a constituent of all concrete natural beings that can be described as secondary matter) precedes dependence on God and is a condition for it, then prime matter (and hence all concrete natural beings) cannot be the outcome of creation. A further aspect that is incompatible with the doctrine of creation is Cesalpino’s view that the new causal powers brought about in animate beings by the presence of the divine intelligence arise by necessity. Cesalpino understood this to be a consequence of the nature of divine self-reflection:

It suffices that there is some separate speculative intellect, which does not understand for the sake [of an animate being]; rather, it understands for its own sake and persists in its own perfection; consequently, the other substances that depend on it are *by necessity* imbued with the appetite; this perfection is called the nature of each single being, and by means of it every natural motion becomes more perfect.[[51]](#footnote-51)

Cesalpino’s reasoning seems to be that, if the divine essence consists in self-reflection, it is impossible for the divine intelligence not to reflect upon itself. But if self-reflection comes about by necessity, then also the new causal powers that result in material composites from the presence of the divine intellect must arise in a non-contingent manner. Moreover, describing the perfection of divine self-reflection as the nature of each single animated being strongly confirms the reading that divine self-reflection is understood inhere in animate beings.

How problematic Taurellus found these aspects of Cesalpino’s thought becomes clear in his response to a second, diverging interpretation of Cesalpino’s theory of animation that he took into consideration: “But if you maintain *that everything that exists has not only animation but also existence from the first being*, there would be a flowing of essences from the first being.”[[52]](#footnote-52) While in *Daemonum investigatio peripatetica*, Cesalpino explicitly stated such a view, in *Quaestiones peripateticae* one finds the vaguer idea that “prime matter depends on this first actuality, which means that what is divisible depends on what is indivisible and multiplicity on the one; for the division of matter is the cause of multiplicity.”[[53]](#footnote-53) What is missing from the description given in *Quaestiones peripateticae* is the specific reference to notions such as appetition, goodness and divine essence. But what is found is an element absent from the description given in *Daemonum investigatio peripatetica*: the view that prime matter depends on the first being in a way that does not presuppose any kind of potentiality on the side of the first being. As Cesalpino argued, “otherwise, there would be an infinite regress. For prior to this potentiality, another actuality would be required, in which this potentiality is founded …”[[54]](#footnote-54) Cesalpino’s argument seems to move from the plausible assumption that every potentiality must be founded upon actuality to the assumptions that every potentiality in one entity has to be founded upon the actuality of another entity. Speaking of an infinite regress also seems to imply the assumption that the actuality of the entity upon which potentiality is grounded in turn presupposes potentiality in a third entity, and so on. Taurellus contested the latter two assumptions. He denied that supposing that divine agency presupposes potentiality leads to an infinite regress, writing “for actuality and potentiality do not stand in the same relation. In order for potentiality to occur, another actuality necessarily must exist before: but not vice versa.”[[55]](#footnote-55) He maintained that both potentiality and actuality can be regarded as characteristic of God:

Because the potentiality, due to which we say that things depend on GOD, does not depend on GOD but rather belongs to GOD himself and is in GOD himself, namely a necessary power of the divine essence: which nevertheless does not act out of necessity but rather according to the will of God himself.[[56]](#footnote-56)

Here, the central disagreement Taurellus has with Cesalpino’s account of the relation between God and world comes to the fore. Taurellus was clear that Cesalpino’s conception would lead to necessitarianism not only with respect to the soul’s powers but also with respect to the existence of natural particulars:

If things do not depend on GOD through an intermediary potentiality, they exist necessarily … What exists necessarily always existed and always will exists necessarily. For what once did not exist, has been made at some time; and it has been made through some preexisting potentiality. Our Christian faith sufficiently teaches how impious it is to assume that all things depend on GOD in such a way that they have not been made by him or that they cannot be changed by him.[[57]](#footnote-57)

Taurellus agreed with Cesalpino that certain features follow with necessity from the divine essence. But unlike Cesalpino, he included among the qualities that necessarily follow from the divine essence the ability to use will. And the use of will presupposes the ability to choose between acting and not acting. As Taurellus put it: “we … ascribe truly and piously potentiality to our God, such that he can act when he wants to and that he can also not act.”[[58]](#footnote-58) Because potentiality involves a space of alternative possibilities, it is incompatible with necessity. And if creation presupposes the power of the will to chose between acting and not acting, then the necessitarian consequences of Cesalpino’s account of the relation between God and the world seem to be incompatible with the doctrine of creation.

**6. Concluding Remarks**

In this article, I have used some of Taurellus’s observations as a framework for interpreting Cesalpino’s account of the origin of sensitive powers. It may be worth the while to indicate that the approach taken here leads to results that diverge significantly from an influential recent interpretation of Cesalpino’s understanding of blood and vital heat. According to Catrien G. Santing, Cesalpino’s project should be understood in the context of the early modern reception of spiritual interpretations of natural particulars such as blood prominent in late medieval theology. In this tradition, blood acquired a variety of spiritual meanings—ranging from the incarnation and suffering of Christ to the workings of the Holy Spirit.[[59]](#footnote-59) And it is well documented that allusions to this tradition can be found in early modern works on anatomy and physiology.[[60]](#footnote-60) In Santing’s view, when Cesalpino talks about vital heat as a divine principle inherent in blood his aim to offer support for such spiritual interpretations of blood.[[61]](#footnote-61) However, while there cannot be any question about Cesalpino’s loyalty to Catholicism, it is not evident that his theoretical reflections were concerned with Counterreformation theology. To my knowledge, Cesalpino did not discuss Christ, the Holy Spirit, the doctrine of creation, or any of the specific theological doctrines that divided Catholicism from other denominations.

The absence of specifically Christian issues, let alone of topics central to the dynamics of confessionalization, may allow for an alternative interpretation of Cesalpino’s analogical use of blood and vital heat. Cesalpino’s cardiocentric physiology may turn out to have not been motivated by the desire to instantiate a pattern of thought well entrenched in the Catholic tradition and but rather by the desire to think through the Aristotelian conception of a self-reflexive divine intellect that functions as the final cause for natural particulars and the universe as a whole—a conception that can function as explanation for a wide range of natural phenomena, ranging from the origin of vegetative, sensitive and rational powers to the motion of heavenly bodies. The analogies that Cesalpino drew between animate substances, the animate universe and the divine intellect is grounded on the claim that the divine intellect is a constituent of animate substances and the animate universe. For this reason, Cesalpino held that the vegetative and sensitive powers characteristic of animate beings could not come about without the striving of the divine intellect, and that the same holds for the striving characteristic of heavenly bodies. If so, then Taurellus may to have been on the right track when he ascribed to Cesalpino a conception of God as a constitutive cause of living beings and the universe.

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1. For an overview of this work, see Muratori, “Seelentheorien nördlich und südlich der Alpen”; on Taurellus’s life and works, see Blank, “Nicolaus Taurellus”; for overviews of Taurellus’s metaphysics, see Petersen, *Geschichte der aristotelischen Philosophie im protestantischen Deutschland*, 219–258; Mayer, *Nikolaus Taurellus, der erste Philosoph im Luthertum*; Leinsle, *Das Ding und die Methode*, 147–165; Wollgast, *Philosophie in Deutschland zwischen Reformation und Aufklärung*, 148–153. On the reception of Cesalpino in Altdorf, see Mulsow, “Ambiguities of the Prisca Sapientia in Late Renaissance Humanism”, 7–9. [↑](#footnote-ref-1)
2. From the 1880s onward, these views have led to scholarly controversies that came to a close with Pagel, *William Harvey’s Biological Ideas*, 169-209; Pagel, “The Claim of Cesalpino and the First and Second Editions of his ‘Peripatetic Questions’”; Bylebyl, “Cesalpino and Harvey on Portal Circulation”; Bylebyl, “Nutrition, Quantification and Circulation.” [↑](#footnote-ref-2)
3. Cunningham, “The Principality of Blood,” 204, note 8; see Colombo, *De re anatomica libri XV*, 15. [↑](#footnote-ref-3)
4. QP, fol. 115v; see Aristotle, *De respiratione*, § 4, 482b29–36. [↑](#footnote-ref-4)
5. QP, fol. 115v; see Aristotle, *De gen. an.* 2.4, 740a16–22. On Cesalpino’s adoption of these doctrines, see Santing, “‘For the Life of a Creature is in the Blood’, 433–434. [↑](#footnote-ref-5)
6. QP, fol. 127v; see *De part. an.* 2.10, 565b19–21. [↑](#footnote-ref-6)
7. QP, fol. 127v; see *De part. an.* 3.5, 687b22–24. [↑](#footnote-ref-7)
8. QP, fol. 127v; see *De an*. 3.2, 426b20-22; *De sensu*, § 7, 449a10–17. [↑](#footnote-ref-8)
9. QP, fol. 131r: “animalia quae minus distincta sunt, communionem hanc vasorum arctiorem habent: unde fit ut divisa vivere aliquamdiu possint, principia enim non habent distincta, sed velut disseminata in ductibus.” [↑](#footnote-ref-9)
10. QP, fol. 43r. [↑](#footnote-ref-10)
11. QP, fol. 43r: “quomodo aeternum & mortale unum numero sunt” [↑](#footnote-ref-11)
12. QP, fol. 43r: “sequetur in omnibus corporibus cum forma materiali & immaterialem quoque inesse” [↑](#footnote-ref-12)
13. QP, fol. 43r; see Aristotle, *De anima*, 1.5, 411a8. [↑](#footnote-ref-13)
14. For detailed discussion, see Maier, “Das Problem der ‘species sensibiles in medio’”. [↑](#footnote-ref-14)
15. For an example of the latter approach in the natural philosophy of Girolamo Fracastoro, see Blank, “Julius Caesar Scaliger on Corpuscles and the Vacuum”, 142–144. [↑](#footnote-ref-15)
16. QP, fol. 135v–136r: “in organo & corpore recipitur species cum quantitate & divisibilis, idcirco non contingit eodem tempore contraria sentire ut lumen & tenebras, calidum & frigidum secundum eandem partem corporis …” [↑](#footnote-ref-16)
17. QP, fol. 135v: “At cum sensus iudicat diversa vel contraria, actu patitur & multitudinem recipit. Quomodo igitur unus erit tunc actu sensus? Quod si non fuerit unus, quomodo iudicare diversitatem poterit? Necesse igitur est indivisibile esse id quod iudicat …” [↑](#footnote-ref-17)
18. Taurellus, *Alpes caesae*, 936: “Ideo Caesalpini miror imprudentiam: … quod ea quae optimo consilio Deus, & natura distinxerunt, ipse ausit confundere.” [↑](#footnote-ref-18)
19. Taurellus, *Alpes caesae*, 25–26. [↑](#footnote-ref-19)
20. Taurellus, *Alpes caesae*,309: “Quid hoc quaeso est aliud: quam Dei: rerumque ceterarum omnium substantias ita confundere; ut unaquaeque Deus ipse dicitur esse aliqua ex parte?” [↑](#footnote-ref-20)
21. On the natural philosophy in this work, see Clark and Summers, “Hippocratic Medicine and Aristotelian Science.” [↑](#footnote-ref-21)
22. *De gen. an.* 2.3, 736b29-727a7. On this passage, see Solmsen, “The Vital Heat, the Inborn Pneuma, and the Aether.” For critical discussion, see Preus, “Science and Philosophy in Aristotle’s Generation of Animals,” 35–38; Freudenthal, *Aristotle’s Theory of Material Substance: Heat and Pneuma, Form and Soul*, 19–29, 40–46, 114–129; Lennox, *Aristotle’s Philosophy of Biology*, 229–249. [↑](#footnote-ref-22)
23. DIP, fol. 148r: Ostensum est … calidum innatum corpus esse divinius quam elementa, quamvis ex illis constituatur: & merito respondere elemento stellarum non solum ratione foecunditatis, quae ab intelligentia habetur in eo comprehensa, sed etiam ratione immortalitatis subiecti, & puritatis. [↑](#footnote-ref-23)
24. DIP, fol. 147r. [↑](#footnote-ref-24)
25. *De part. an.*, 1.5 (645a23-27). [↑](#footnote-ref-25)
26. DIP, fol. 147r: “Significavit autem id … pulchrum ... rationem finis, cuius gratia natura agit, & cuius principium caelitus dicitur … Nam Divinum illud, quod sempiternum est, causa semper est sua natura melioris conditionis in rebus contingentibus. Corpus autem primum recipiens hanc divinitatem esse materiam primam, hinc patet. Haec enim est, quae secundum suam ipsius naturam appetit id, quod divinum est, bonum & appetibile.” [↑](#footnote-ref-26)
27. DIP, fol. 147r: “quod sine motu & mutatione fluit a divina essentia, divinum quoque, & immortale sit …” [↑](#footnote-ref-27)
28. QP, fol. 30v. [↑](#footnote-ref-28)
29. DIP, fol. 148v: “Quia … in spiritu seu calore innato inest actu facultas animalis, non in igne nec caeteris elementis, ideo divinius hoc corpus dicitur: recipit enim actu virtutem divinae intelligentiae …” [↑](#footnote-ref-29)
30. DIP, fol. 148v. [↑](#footnote-ref-30)
31. Taurellus, *Alpes caesae*, 26: “Cum enim docuisset Aristoteles omnem rerum multitudinem a materia proficisci: magnum hinc dogma Caesalpinus instituit: unicam videlicet esse substantiam incorpoream. Ne vero vel corporeas faceret animas: vel earum cogeretur admittere multitudine: has unius illius incoporeae substantiae partes aliquas esse professus est: quae pro subiecta materia multitudinis subeant rationem.” [↑](#footnote-ref-31)
32. QP, fol. 9v: “alio modo quatenus ipsum esse diverso modo participant, ab uno quodam quae substantia est descendentia ….” [↑](#footnote-ref-32)
33. QP, fol. 32v. [↑](#footnote-ref-33)
34. QP, fol. 35r: “Quoniam vero huiusmodi intellectio substantia est, idem enim cum intelligibili, & est intellectionis intellectio” See Aristoteles, *Met.*, 12.9.4, 1074b32–34. [↑](#footnote-ref-34)
35. QP, fol. 35r. [↑](#footnote-ref-35)
36. QP, fol. 35v: “Quatenus enim perfectissimum ens est, caeteris esse distribuit & perficit omnia: quatenus autem intellectio est, perfectionis desiderium rebus indit.” [↑](#footnote-ref-36)
37. QP, fol. 32v: “Speculativus … intellectus substantia existens per se, non alterius gratia appetibilis, ea quae apta nata sunt appetere, perficit, non agendo quippiam, aut introducendo in materia aliquid …; sed per sui praesentiam educendo ex potentia materiae formam ad quam apta nata est.” [↑](#footnote-ref-37)
38. QP, fol. 22r–v: “Elementa separata … actu non continent divinum hoc, sed potentia solum: in mixtione autem etiam actu: idcirco & actu sunt substantiae.” [↑](#footnote-ref-38)
39. On early modern theories of e*ductio*, see Blank, “The Question of Emergence in Protestant Natural Philosophy”; Blank, “Sixteenth-Century Pharmacology and the Controversy between Reductionism and Emergentism”; Blank, “Instrumental Causes and the Natural Origin of Souls in Antonio Ponce de Santacruz’s Theory of Animal Generation.” [↑](#footnote-ref-39)
40. QP, fol. 35v–36r: “Patet igitur ex dictis quo pacto unica intelligentia omnium rerum intelligentias contineat, est enim tanquam mensura omnium. Quemadmodum autem se habet intellectiones, sic etiam & res ipsas esse manifestum est: ab uno igitur multitudinem descendere non est impossibile. Patet etiam ex reductione entium ad unum, & ex modo quo substantiarum genera dicuntur secundum additionem & ablationem … Quatenus igitur simpliciter est, & per ablationem omnis materiae dicitur, unica & simplex est substantia.” [↑](#footnote-ref-40)
41. QP, fol. 21v: “Esse autem animatum ipsum universum, si coelum animatum est, rationi est consentaneum … Nam & in animalibus non est necesse animam in toto corpore esse, sed sufficit esse in principali parte ut corde.” [↑](#footnote-ref-41)
42. QP, fol. 21v: “universum organicum quiddam est, constat enim ex similaribus certo modo dispositas ad aliquod opus: organorum autem natura non nisi ab anima est: hec enim est animae esse.” [↑](#footnote-ref-42)
43. Taurellus, *Alpes caesae*, 133. [↑](#footnote-ref-43)
44. See above, note 19. [↑](#footnote-ref-44)
45. QP, fol. 36r: “Ob multitudinem … formarum materialium non est necesse intelligentias multiplicari. Ratione autem moventium orbes coelestes, quemadmodum Aristoteles multitudinem substantiarum immobilium constituit, sic intelligentiarum multitudo ponenda videtur … Simile igitur esset ac si animam sentientem multas habere partes censeremus, quia multis instrumentis vim sentiendi tribuit: cum tamen per se una sit & indivisibilis in corde sedens, ut voluit Aristoteles. Hoc autem modo intelligentias multas esse non repugnat unitati & simplicitati intelligentiae, quam posuimus. Ut enim eadem anima sentiendi in oculo visus appellatur, in aure autem auditus; sic eadem intelligentia quatenus quidem Lunam movet, Lunae ascribitur: quatenus autem Saturnum Saturno: & de caeteris eodem modo.” [↑](#footnote-ref-45)
46. QP, fol. 32v: “amatum mouet corpora celestia: appetere autem & amare haec non possunt, nisi intelligant ipsum bonum …” [↑](#footnote-ref-46)
47. QP, fol. 29r: “Idcirco summum bonum & optimum unum maxime existens omnia implet sui desiderio, & quod simpliciter est bonum, unicuique sigillatim sit bonum absque infectione materiali aut diminutione aliqua essentiae.” [↑](#footnote-ref-47)
48. QP, fol. 32v: “Credere autem idem esse & secundum idem id quod movetur, & quod appetit, & quod intelligit, non nisi fatuum, est: non enim secundum eandem partem haec fiunt etiam in animalibus. Motus enim secundum nervos & articulos perficitur: appetitus autem in corde aut proportionali consistit: virtus autem sentiendi in propriis organis: Mentis autem virtus separata est. Similiter dicendum de coelo. Cum enim in eo tria sint, id quod movetur, corpus: movens, intelligentia: & tertium quo movetur, appetitus: unum quidem aliquod est, quod movetur, quod appetit, & quod intelligit, non tamen secundum easdem partes aut potentias. Secundum igitur corporis naturam motus inest, hoc enim primo movetur: secundum intelligentiam intelligit, haec enim propria est intellectus operatio non communicans cum corpore: secundum autem coniunctum appetit: amare enim, & odisse, & desiderare affectiones sunt coniuncti ex anima & corpore (*De an*. 1.1, 403b16–19).” [↑](#footnote-ref-48)
49. Taurellus, *Alpes caesae*, 755: “Atque ita ut id solum: quo haec corpora sunt animata: vel quo sunt substantiae: a primo ente dependeant.” [↑](#footnote-ref-49)
50. Taurellus, *Alpes caesae*, 755-756: “Unde liquet: neque materiam primam: neque secundam, hoc est, corpus, quod non sit animatum: a primo ente dependere. Quae cum ita sint: necesse est: *ut sit dependentia a primo ente, praeexistere aliquid, quod sit actu: sed quod ex se non sit animatum*.” [↑](#footnote-ref-50)
51. QP, fol. 32r: “sufficit speculativum esse quendam intellectum separatum, qui non huius quidem gratia intelligat (non enim esset ultimus finis, cum ad opus aliud dirigeretur) sed sui quidem gratia intelligente, & in sua perfectione persistente, reliquis substantiis ab ipso pendentibus, *ex necessitate* appetitus ille innascatur, quae natura dicitur uniuscuiusque, a quo omnis motus naturalis perficitur” (my emphasis). [↑](#footnote-ref-51)
52. Taurellus, *Alpes caesae*, 756: “Si vero *non animari, sed esse velis a primo ente quicquid est*:hic essentiarum ex primo ente erit defluxus.” [↑](#footnote-ref-52)
53. QP, fol. 99r: “Primam … materiam ab illo actu pendere concedimus qui primus est, ab indivisibili scilicet divisibile, & ab uno multitudo: materiae nanque divisio multitudinis est causa …” [↑](#footnote-ref-53)
54. QP, fol. 99r: “dicimus dependentiam entium a primo ente non supponere ex necessitate praeexistentem potentiam: sic enim processus esset in infinitum. Nam ante illam potentiam alter actus requireretur, in quo fundaretur potentia …” [↑](#footnote-ref-54)
55. Taurellus, *Alpes caesae*, 755: “Non enim eadem actus & potentiae est ratio. Ut potentia sit, actum praeexistere necesse est: at non viceversa.” [↑](#footnote-ref-55)
56. Taurellus, *Alpes caesae*, 756-757: “Nam potentia, per quam res a DEO dependere dicimus, non dependet a DEO: sed ipsius est DEI: & in ipso est DEO divinae scilicet essentiae virtus necessaria: quae non agit tamen necessario: sed pro ipsius DEI voluntate.” [↑](#footnote-ref-56)
57. Taurellus, *Alpes caesae*, 756: “Si res a DEO non dependent per intermediam potentiam: necessario sunt … Quod necessario est id semper fuit, & semper erit necessario. Nam quod aliquando non fuit: aliquando factum est: & quidem per praeexistentem potentiam. Res autem omnes a DEO ita dependere: ut ab eo factae non sint: nec ab eo mutari possint: nostra fides Christiana satis docet, quam sit impium.” [↑](#footnote-ref-57)
58. Taurellus, *Alpes caesae*, 748: “nos … & vere, & pie nostro Deo potentiam ascribimus: ut facere possit ea, quae vult: & possit etiam non facere.” [↑](#footnote-ref-58)
59. See Rubin, *Corpus Christi. The Eucharist in Late Medieval Culture*; Bynum, *Wonderful Blood*. [↑](#footnote-ref-59)
60. See Lazzerini, “Anatomy and Blood Sacrifices in the Renaissance Period”; Knoeff, “Unspeakable Blood.” [↑](#footnote-ref-60)
61. Santing, “‘For the Life of a Creature is in the Blood’; Santing, “*Deus rotator* and the Microrotator.” [↑](#footnote-ref-61)