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Jacob Schegk on Plants, Medicaments, and the Question of Emergence

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**Abstract**

The view that living beings as well as plant-based medicaments possess causal properties that are caused by the causal properties of their constituents, without being reducible to the combination of the causal properties of these constituents goes back to ancient thinkers such as Alexander of Aphrodisias and Johannes Philoponus. In the early modern period, this view was not only criticized by natural philosophers taking a reductionist stance; it was also criticized by Neo-Platonic thinkers such as Jean Fernel. One of the relatively few early modern natural philosophers who adopted an emergentist position was Jacob Schegk. The present article discusses whether Schegk’s analysis of the structure of plants and medicaments offers the theoretical resources required to answer Fernel’s critique of the tradition going back to Alexander. In particular, it examines whether Schegk’s account of synchronic upward causation and diachronic downward causation could offer solutions to two interrelated problems identified by Fernel: the question of whether a mere aggregates of material particles could form a composite that possesses substantiality, not only accidental unity; and the question of whether multitudes of material particles could bring forth simple forms, whose existence seems to be presupposed by powers that cannot be ascribed to the constituents.

1. Introduction

Emergentism—the view that material composites can give rise to novel causal potencies that are not reducible to the sum of the causal powers of their composites—is a view that goes back to antiquity. Perhaps the most unambiguous formulation of the idea is found in Alexander of Aphrodisias (fl. ca. 200 AD). As Victor Caston has argued, similar strands of thought can be also found in Aristotle and Galen (Caston, 1997). And as Richard Sorabji and Jonardon Ganeri have pointed out, the sixth-century Aristotelian commentator Johannes Philoponus is a good candidate for inclusion in this tradition, as well (Sorabji, 2010; Ganeri 2011). In medieval natural philosophy, too, deviant forms of emergentism—deviant due to a greater emphasis on celestial causation in the actualization of the potentialities of matter—have been influential, as Olaf Pluta has brought to light (Pluta 2007). Also the Latin term “eductio” that was widely used to designate the concept of emergence stems from the medieval tradition.

Given the enormous influence of the ancient and medieval authorities in sixteenth-century natural philosophy, one would expect emergentist ideas to proliferate in this period. However, what one observes is a preponderance of alternatives to emergentism. These alternatives diverge widely, ranging from theories that project properties of living beings unto their basic constituents, to early versions of reductionism, to a variety of theories of celestial influences, immaterial agents, and divine intervention. One possible explanation for the evident reluctance to adopt emergentism could be derived from the repercussions of the Pomponazzi affair (1518–1525). The fierce opposition that Pomponazzi faced could well have been taken to indicate that any train of thought inspired by Alexander could lead to theologically unacceptable conclusions concerning the immateriality and immortality of the human soul.[[1]](#endnote-1) Another possible explanation—more interesting from a philosophical point of view—could draw on the highly influential work of the Paris-based physician and natural philosopher Jean Fernel (ca. 1497–1558), who identified a number of difficulties inherent in Alexander’s accounts of the origin of souls and the substantial forms of medicaments

These obstacles, however, did not have the effect that no-one in the sixteenth century had chosen an emergentist option. As Eckhard Kessler has documented, elements from Alexander’s thought haven been taken up by Girolamo Fracastoro (1478–1553), Simone Porzio (1497–1554), Girolamo Cardano (1501–1576) and Bernardino Telesio (1509–1588) (Kessler, 2011, 67–82). There is also some literature about the influence of Alexander on Jacopo Zabarella (1533–1589) (Mitrovic, 2009; Blank, 2015, sec. 2). In earlier work, I have traced emergentist aspects of the work of Nicolaus Taurellus (1547–1606) (Blank, 2014) and Antonio Ponce de Santacruz (1561–1632) (Blank, 2019). Also, I have analyzed the controversy between reductionism and emergentism in sixteenth-century pharmacology, in particular the controversy between Thomas Erastus (1524–1583), who had formulated one of the most refined arguments in favor of reductionist explanations of the causal powers of medicaments,[[2]](#endnote-2) and Jacob Schegk (1511–1587), who defended the existence of irreducible causal powers of some plant-based medicaments (Blank, 2018). In this article, I will return to Schegk and discuss a question that I have not yet addressed so far—the question of whether Schegk’s emergentism provides the theoretical resources necessary to counter the critique of emergentism found in Fernel, to whose views Schegk refers frequently.

Schegk made his entire scholarly career in Tübingen, first as the rector of the *Contubernium*, then as a professor of philosophy, subsequently as a professor of medicine at the University of Tübingen, where served no less than six terms as a rector.[[3]](#endnote-3) During his lifetime, Schegk was a figure of European standing, mainly due to his controversy with Petrus Ramus about the nature of logic.[[4]](#endnote-4) He also engaged in a theological controversy with Simone Simoni (1532–1602) and Thomas Erastus over issues such as Christ’s omnipresence and the nature of the Trinity.[[5]](#endnote-5) Schegk took a keen interest in the work of Alexander of Aphrodisias, and his own early work on Stoic physics, *De causa continente* (1540), is accompanied by a Latin translation of Alexander’s De mixtione. This brings with it that Schegk early on was not only exposed to Alexander’s criticism of Stoic physics—whose line of argument he followed closely—but was also exposed to some basic elements of Alexander’s own view on the nature of mixture. Arguably, the same orientation informs Schegk’s later works on the origin of living beings, especially *De plastica seminis facultate* (1580) and *De caloris vi et efficacia in rebus naturalibus* (1585). Schegk’s natural philosophy remained a point of reference in the next generation of Lutheran metaphysicians. His most prominent student was Nicolaus Taurellus, who integrated some inspirations derived from Schegk into his own natural philosophy (Blank, 2014, 665–667).

In recent years, Schegk’s natural philosophy is beginning to be studied by commentators (Kusukawa, 1999; Hirai, 2007), but it seems fair to say that many aspects of his natural philosophy are still largely unexplored. This holds certainly for the question of whether Schegk’s natural philosophy offers theoretical resources for countering Fernel’s critique of Alexander. I will proceed as follows. Section 2 will outline Fernel’s arguments against Alexander’s views concerning the soul and the substantial forms of medicaments. Section 3 aims at dissolving the impression that Schegk has been committed to a theory of a corporeal but non-elementary (and, hence, non-emergent) stuff in seeds. Section 4 examines Schegk’s views about the role of mixtures of elements and innate heat in the emergence of formative powers in seeds and of substantial forms in living beings. Section 5 explores Schegk’s views concerning the role of substantial forms of living beings in downward causation on the material parts from which they arise, thereby providing insights into his analysis of the origin of the substantial forms of plant-based medicaments. Finally, section 6 investigates Schegk’s views concerning the unity and substantiality of beings that are the bearers of emergent potencies and forms.

2. Fernel’s Critique of Emergentism

One of the most fascinating aspects of Fernel’s *De rerum abditis causis* (1548) is that this work uses the dialogue form to explore diverging theoretical options in natural philosophy. Fernel’s literary figure Brutus articulates the emergentist position of Alexander of Aphrodisias as follows:

[T]he form of a composite is a power, derived from the tempering and mingling of the bodies substrate to it; the preparation actually comes from the mingling of the substrate; and the potentiality itself, when it has attained completeness, becomes an entelechy, that is, a perfection, so as to be the form of the thing. Thus, I consider that a form develops from the potentiality of the matter, because the potentiality itself passes over into the form in an unbroken sequence, and becomes action.[[6]](#endnote-6) (Fernel, 2005, 166/67–168/69)

Alexander’s application of this line of thought to medicaments is made explicit when Brutus remarks about form:

[I]t appears to arise from the temperament of the body, like a simple force originating from the temperament and concordant harmony of substrate bodies … In this way we understand that the power of mixed theriac or of a medicated drink develops from the mingled and tempered powers of simples, and this accords with Galen’s attitude too.[[7]](#endnote-7) (Ibid., 174/75)

Eudoxos, the spokesperson of Fernel’s own views, summarizes the implications of Alexander’s position as follows:

In Alexander’s view, the preparation of the substrate must be the original and efficient cause, and not just an accruing and contributing one, because from itself it produces and calls forth the whole essence of the form. [For him] The souls and the whole form emerge at the same time from the body substrate to itself; and the varieties of forms develop from the diversity of bodies.[[8]](#endnote-8) (Ibid., 168/69)

Of course, not every occurrence of the verb “emergere” in early modern texts can be read from the perspective of emergentism. For example, in Fernel’s *Physiologia* the term is frequently used to indicate where a body part originates.[[9]](#endnote-9) Still, in the passage just cited from *De rerum abditis causis* the term seems to be used in a recognizably technical sense. In fact, Fernel’s exposition seems to capture accurately what Alexander had in mind. According to Alexander, the soul “is a power and form, which supervenes through such a mixture upon the temperament of bodies; and it is not a proportion or a composition of the temperament” (Alexander of Aphrodisias, 2008, 104 [*De anima* 25.6–8]). As Caston has argued, talk about supervenience should here be taken in the technical sense of a co-variation of mental states with bodily states (Caston, 1997, 348–349). Moreover, Caston emphasizes that, for Alexander, the soul possesses causal powers that are more than the aggregates of the causal powers of the elements (ibid., 349–350). Likewise, Alexander points out that some medicaments possess powers that arise from their temperament, and since this remark stems from the context of his criticism of the harmony theory of the soul, the implication again seems to be that these are powers that go beyond the powers inherent in the harmony of elementary qualities (Alexander of Aphrodisias, 2008, 104 [*De anima* 24.24–29]). In the sense that Alexander ascribes distinct new powers to souls as well as to the forms of non-animate composites such as chemical blends, Caston therefore characterizes Alexander as one of the ancient thinkers who were committed to emergentism.

Caston’s interpretation thus corresponds closely to Fernel’s understanding of Alexander’s views on medicaments and the soul. Nevertheless, Fernel rejects emergentism due to two problems. The first problem—call it the “Substantiality Problem”—concerns the categorial status of forms in Alexander. This problem is developed by juxtaposing two quotations from Alexander’s *De anima*, presented by the figure of Brutus. This is the first quotation: “[A] form which exists from nature is undoubtedly a substance, just as nature itself is. Of course, however, we suppose that in fire (a natural and simple body) the heat and dryness are a form, and the lightness that arises from them and in them”[[10]](#endnote-10) (Fernel, 2005, 146/47) On this passage, Brutus comments: “Here he clearly states that the form of a composite natural thing is a substance, but the form of an element is a quality …”[[11]](#endnote-11) (ibid.). This view, however, seems to be in tension with the second quotation:

Although a form cannot exist itself on its own in separation from matter, nevertheless we have no doubt that both are substances. For a natural form is a substance too, like matter; the parts of a substance are indeed substances. Indeed, as each part is a substance, what is composed of both is both a substance and a single nature, not like what we see being made by craftsmanship. Their substrate is surely a substance; but the form is regarded as a quality.[[12]](#endnote-12) (Ibid., 146/47–148/49)

Eudoxos points out the relevance of this passage from the question of the substantiality of elements: “If Alexander shows by this argument that the form of a natural composite thing is a substance, he will establish by the same argument that the form of an element itself should also be assigned to the kind of a substance”[[13]](#endnote-13) (ibid., 148/149). However, Eudoxos argues that both for elementary forms and for the forms of composites, Alexander faces a problem: “No accident can really accomplish the essence of a substance; in the same way, what some call the essential difference between things cannot be supplied from an accident, because an accident could not alter the essence of a natural thing”[[14]](#endnote-14) (ibid., pp. 152/153). Thus, neither saying that the emerging form is a quality nor saying that a substantial form can emerge from qualities will be satisfactory.

The second problem—call it the “Simplicity Problem”—is developed by juxtaposing quotations from Alexander’s treatment of elements with quotations from his treatment of composites. On the one hand, Alexander writes:

Simple bodies which have a simple substrate, have taken on a simple form and nature. But those in which the substrate is not simple, but is already some body, or a composite: in them the form is more perfect, with more prominent and complex embellishment. And deservedly so, for the form which is in the matter and the substrate contributes something to the form of things that are composite.[[15]](#endnote-15) (Ibid., 162/63)

On the other hand, Alexander adds a little later: “The multitude of forms, and their diverse mingling, can contribute a reasonable cause of change in substrate bodies”[[16]](#endnote-16) (ibid.). Brutus comments on the latter passage: “Does not this say clearly that the forms of mixed bodies are themselves mixed too, and from them springs a form of the whole, to be itself composite?”[[17]](#endnote-17) (ibid.). Eudoxos is not satisfied: “[T]he simple form of a whole composite has to be single, and being different from the forms of the simple items and the parts, can constrain these forms, unspoilt and intact, into a whole, though they would otherwise perish”[[18]](#endnote-18) (ibid., 164/65). As Eudoxos argues, a mere composite of substantial forms could not possess simplicity (ibid., 180/181) and therefore also could not possess new causal powers (ibid., 186/87).

3. Schegk’s Critique of Stoic Physics

As numerous references document, Fernel was one of the prominent sixteenth-century natural philosophers who were on Schegk’s mind.[[19]](#endnote-19) Hence, the metaphysical difficulties of an emergentist view identified by Fernel can hardly have gone unnoticed by Schegk. What is more, it may even seem counterintuitive to consider whether Schegk’s natural philosophy could be a plausible candidate for an emergentist view. This is so because, in his account of the generation of living beings, developed in *De plastica seminis facultate* (1580), he is committed to the existence of an entity in seeds that he describes as the “instrument” of the plastic faculty and that he characterizes as being neither a composite of elements nor something to which elements could give rise.[[20]](#endnote-20) With a view to this entity, dubbed “divine body” (*corpus divinum*), Schegk quotes approvingly the passage from Aristotle’s *De generatione animalium* II.3 according to which an animal seed contains an entity, variously called “vital heat”, “ether” or “pneuma”, which does not arise from the mixture of elements but rather stands in a relation of analogy to celestial bodies (*De gen. an.*, 736b29–727a7). As Friedrich Solmsen has argued, Aristotle should here be understood as being committed to the existence of a subtle, non-elementary kind of matter that functions as the carrier of formative power.[[21]](#endnote-21) Whether or not such an interpretation captures Aristotle’s intentions, one thing is obvious: the existence of a corporeal entity that does not arise from the basic material building blocks of the natural world certainly would not fit well into an emergentist world view.

 Fernel certainly make an anti-emergentist use of this entity, when he fuses Aristotelian and Neoplatonic conceptions to explain the origin of simple forms through celestial causation. Fernel maintains that “the single Form of the Heaven comprehends in potency all forms, be they already existent or simply possible, of living beings, plants, stones, and metals, and as if pregnant with innumerable forms, begets and spawns from Herself everything; the one Force and Faculty of Him discloses the forces of every perishable thing that ever appeared or will appear in the future” (Fernel, 2005, 111). Giancarlo Zanier and Hiro Hirai have pointed out that Fernel here takes up a tradition dominant in Renaissance Platonism that regards the heavens as the origin of sub-celestial forms (Zanier, 1987; Hirai, 2002; see Ficino, 1489, III.1; Pico della Mirandola, 1557, 1: 11–12). As Fernel holds, mixed bodies such as metals, stones, plants, and animals “draw their essence of their form from heaven” (Fernel, 2005, 315). He is explicit about the view that sub-celestial bodies derive their form from the heavens because the motions of sub-celestial bodies are influenced by the movements of celestial bodies (ibid., 307; see Aristotle, *Meteorologica* I, 2, 339a22 onward). Since motions presuppose forces that move both heavenly and sub-celestial bodies, Fernel maintains that “there surely must be a single uninterrupted power of the whole of nature, which is all diffused in the universe” (Fernel, 2005, 313). As far as spontaneous generation goes, Fernel maintains that the form of spontaneously generated living beings derives from a complex combination of movements of heavenly bodies (ibid., 317–319). In this sense, his view of celestial causation is combinatorial: the complex motions of composite bodies on earth are the result of the combination of motions of heavenly bodies.

To explain how the motion of distant heavenly bodies is communicated to composite bodies on earth and how the transmission of motion accounts for the substantiality of living beings, Fernel invokes the theory of *spiritus* or innate heat. According to Fernel, this entity is not only a force that pervades the universe, but also a subtle, material medium.[[22]](#endnote-22) He writes: “The spirit that carries the world along, dispersed by heaven throughout the universe, endows everything with these [powers], and at the same time with a form …”[[23]](#endnote-23) (Fernel, 2005, 358/59). This *spiritus* not only transmits celestial motions in a way such that composite bodies on earth would be purely passive, but also transmits something of the powers of heavenly bodies to bodies on earth, such that the simple forms of composite bodies become principles of activity of their own. Fernel maintains that the divine spirit “distributes itself” into the whole of a composite body and “dispatches and installs the simple form into the prepared matter” (ibid., 318/19).

Schegk’s own views concerning the nature of this entity seem to be ambiguous. On the one hand, he compares it with the Stoic all-pervading “containing cause” (Schegk, 1580, sig. B2v), thereby suggesting that the entity that he has in mind has something in common with the material *pneuma* of the Stoics. In fact, he ascribes to this entity the capacity of penetrating physical bodies (ibid., sig. B3r)—a property that it shares with the Stoic *pneuma*. On the other hand, Schegk seems to take the relevant entity to be “spiritual” and “devoid of *physis*” (ibid.), thereby suggesting that it is an immaterial entity and perhaps even an entity devoid of a “nature” capable of defining a substance. Since the text of *De plastica seminis facultate* seems to be inconclusive as to the nature of this entity, a consideration of Schegk’s early response to Stoic physics may be helpful here. This is so because, even if Schegk never directly criticized Fernel’s account of *spiritus* and vital heat, he criticizes an aspect that Fernel’s account has in common with the Stoic conception of *pneuma*: the view that the universe is pervaded by a subtle but material medium that transmits motion.

In his discussion of the nature of containing causes, Schegk rejects two central claims of Stoic physics: (1) the claim that the divine mind is an ethereal and corporeal principle; and (2) the claim that matter, due to a divine principle inherent in it, contains hidden forms (Schegk 1540, fol. 11r). Schegk argues that, due to its imperfection, no part of matter is capable of receiving the divine nature, such that the divine nature cannot be thought to be divided according to the division of matter (ibid., fol. 12r). Rather, because the divine being is indivisible, it cannot be extended because every extension is capable of being divided (ibid., fol. 12v). Moreover, Schegk uses the supervenience relation between the body and its powers and an argument against divine immanence:

Corporeal … power diminishes and is weakened through the diminution and weakening of the body, and likewise is augmented and strengthened through the augmentation and growth of the body; but any body, no matter how big, can be augmented; by contrast, nothing can be added to God; hence he exists in an incorporeal way.[[24]](#endnote-24) (Ibid., fol. 13r)

Also the supposed capacity of ether to penetrate elementary matter seems problematic to Schegk: If the divine principle is ethereal, it is itself a physical body; however, a physical body cannot go through another physical body (ibid., fol. 14r)—an argument that is taken up also in *De plastica seminis facultate* (Schegk, 1580, sig. B3r). Furthermore, Schegk points out an explanatory gap in Stoic physics: it remains unclear how the ether can carry all the manifold potencies that are ascribed to it, especially if the ether is supposed to be the same everywhere (Schegk, 1540, fol. 16r). Since Schegk in *De plastica seminis facultate* holds the line of argument developed in *De causa continente* still to be valid (Schegk, 1580, sig. [B6v]), it seems highly improbable that he would have taken the “divine body” included in the seed to be a physical body. As we shall presently see, Schegk offers a more appealing alternative for interpreting this entity.

4. Schegk on Mixture, Innate Heat and Emergent Forms

As an alternative to Stoic physics, Schegk adopts in *De causa continente* much of Alexander’s theory of mixture. The core idea of Alexander’s *De mixtione* is expressed in the following account that Schegk gives of the role of the tempering of elemental qualities in mixture:

Those entities that constitute a temperament are first divided and split up amongst each other into minute parts, then their activity is gradually diminished through the composition of minimal parts …, and third, as it were through some agreement, they jointly bring about a single form of the entire mixed body.[[25]](#endnote-25) (Schegk, 1540, fol. 65r)

This view is still present in one of Schegk’s last writings, *De occultis seu abditis, et manifestis medicamentorum facultatibus* (1585). There, Schegk maintains that both inanimate forms and animate forms depend on the mixture of elements:

Some forms are merely natural, and without them animate forms cannot exist. However, the natural forms can exist without the animate forms, as when the form of the animate flesh decays. Both kinds of form have their mixture, and when the mixture is destroyed, also its substantial form is destroyed …[[26]](#endnote-26) (Schegk, 1585, 122)

Such conception of the origin of animate forms has the consequence that “an animate form also is a physical form”[[27]](#endnote-27) (ibid.). This is why Schegk takes natural forms to be inseparable from matter (ibid., 54). The only exception that Schegk wants to allow concerns human souls, which he takes to be the result of separate acts of divine creation (Schegk, 1580, sig. G5r). But he is clear that this sets human souls apart from all other substantial forms of living beings which are “educed” from the potencies of matter (ibid.). Consequently, all natural forms are understood as being not only inseparable but also causally dependent on matter:

In nature, there is no essential potency, either manifest or hidden, without a natural potency or impotency that arises in natural things due to the mixture of the four elements—the mixture through which as an instrumental cause also natural potencies are generated and destroyed.[[28]](#endnote-28) (Schegk, 1585, 66)

As he explains, “[w]e call an instrumental cause a cause due to which substances and their properties are generated and without which neither substances nor their properties can be saved from corruption” (ibid., 88). More specifically, the relation between mixture as instrumental cause and the essential form generated through it is characterized as a supervenience relation. As Schegk maintains, what cannot be the case is the situation in which different substantial forms and joined with the same temperament (ibid., 123). Or, as he expresses it: “As many differences as there are of substantial forms, so many differences are there between temperaments of mixtures of elements, through which such differences between substances are generated …”[[29]](#endnote-29) (ibid., 152).

To the natural forms that depend in this way on matter belong not only the substantial forms of living beings but also the plastic faculty inherent in seeds. This becomes clear when Schegk uses the phenomenon of plant degeneration—the process by means of which a cultivar reverts back to its corresponding wild variety—to illustrate the way in which the plastic faculty depends on matter. Schegk interprets this phenomenon as an instance of species change: A change in natural potencies modifies the essential potencies of the seed and, hence, the “essential form” of the seed (ibid., 85). The analogy between plant degeneration and the origin of the plastic faculty suggests that, as the substantial forms of the wild varieties of plants emerge from the change in the natural potencies of matter, so does the plastic faculty emerge from the instrumental causes contained in the seed.

This leads us back to the question of how one particular instrumental cause contained in seeds—the “divine body”—could be interpreted. To fill in the explanatory gap left by his rejection of *pneuma*, Schegk uses the concept of innate heat (*calidum nativum*, *thermos emphytos*). For present purposes, the most pressing questions are (1) what is the causal role of innate heat in the generation of substantial forms, and (2) why did Schegk believe the assumption of the existence of innate heat to be necessary? As to the first question, Schegk maintains in *De causa continente* that innate heat should not be regarded as the primary cause of generation but rather as one cause among others (Schegk, 1540, fol. 15r). In his late *De caloris vi et efficacia in rebus naturalibus* (1585), he returns to this issue and maintains that innate heat does not emerge from elementary qualities but rather derives from celestial bodies (Schegk, 1585, 294). What is more, he unambiguously characterizes this kind of heat as a quality:

Because innate heat is a quality, it must necessarily inhere in its proper subject, which is that which, being of the same genus due to mixture, underlies the substantial form as the ultimate or proper matter. Before this heat is perfect, in ultimate matter, form will not be in it … Hence, simultaneously with ultimate matter the form arises and, simultaneously with it, it perishes, in such a way, however, that innate heat is a proper quality of the ultimate matter which is the proper subject of the nascent form.[[30]](#endnote-30) (Schegk, 1580, sig. [I8r])

Thus, innate heat for Schegk is not a kind of subtle matter but rather a quality that is one of the causal factors that play a role in the emergence of substantial forms. Due to this causal role, he characterizes innate heat also as “plastic heat” (*plasticus calor*) (Schegk, 1585, 294) and—after some hesitation (Schegk, 1580, sig. L3r)—identifies it with the entity that, according to Aristotle, bears an analogy with the celestial bodies (Schegk, 1585, 295–296). The qualitative, non-corporeal nature of this entity may explain why Schegk takes it to be “spiritual” and “without physis” (Schegk, 1580, sig. B3r). Moreover, it may explicate the sense in which it shares with Stoic *pneuma* the capacity of penetrating physical bodies.

Still, this leaves us with the question of why it should be necessary to stipulate the existence of such a non-elementary causal factor. Schegk offers an answer that derives from a traditional assumption concerning the nature of a temperament, namely, the assumption that, once a temperament has reached its completion, the tempered elementary qualities have reached an equilibrium or “balance”, understood as the stable end-point of processes of interaction between elementary qualities (see Kaye, 2014, 4). Schegk maintains that such a mixture can bring forth a new substantial form that has new causal powers that act upon other bodies; but he argues that, due to the stability of the equilibrium of elementary qualities the mixture and its substantial form do not acquire the powers of changing themselves (Schegk, 1585, 273, 277–278). This distinction between active powers working on other bodies and active powers working within a body produced by mixture motivates Schegk’s usage of the distinction between elementary heat and innate heat. He introduces the notion of innate heat as a non-elementary causal factor that continuously disturbs the state of equilibrium of elementary qualities. Only such a continuous disturbance of equilibrium is what, as he argues, can explain the emergence of the ability of a composite to change itself because the composite will perpetually strive towards restoring the equilibrium (ibid., 275–276). Such an ability of self-change is exactly what is needed in living beings. This, then, is the kind of novel causal power of the emergent plastic faculties inherent in seeds and the substantial forms of living beings—active powers of self-change that are absent in elements and in mixtures that have reached a stable balance between elementary qualities.

5. Schegk on Diachronic Downward Causation

Both self-motion and self-reproduction involve the capability of living beings of acting upon themselves. This is why the role of emergent substantial forms in downward causation, for Schegk, is crucial for characterizing the new causal powers that the emergent substantial forms. Another ancient emergentist thinker on whose views Schegk has commented in some detail (see Schegk, 1550, 160–163, 166–169) may be relevant for understanding the version of emergentism defended by Schegk: Johannes Philoponus. The textual connection to Philoponus in Schegk’s work is certainly much weaker than the connection to Alexander, and I do not want to make any claims concerning influence. Still, using Philoponus as a point of comparison may make a strand of thought in Schegk more salient than it might otherwise be. As Richard Sorabji has noted, what is distinctive in Philoponus’s emergentism is the view that the mental potencies that emerge from the temperament of elementary qualities not only have new causal powers in relation to other substances but that these new causal powers also act downward upon the temperament of the parts of the organic body (Sorabji, 2010, 33–34). For instance, Philoponus holds that learning renders the body warmer and, thereby, has an influence on further mental potencies, for example, by thereby rendering a person less irascible.[[31]](#endnote-31) Consequently, each emergent property that arises later in time can be regarded as the outcome of an emergent property that occurred earlier in time, together with the material causation of parts of the organic body that have been modified by the agency of the emergent property that occurred earlier. As Jonardon Ganeri notes, the ensuing view of emergence combines a conception of synchronic causation in the case of material causation with a conception of diachronic causation in the case of the downward causation (Ganeri, 2011, 691–692).

Arguably, the distinction between synchronic upward causation and diachronic downward causation is also useful for analyzing Schegk’s position. And, as it turns out, in his discussion of pharmacological potencies, Schegk seems to have envisaged a modification of this framework that is not found in Philoponus. In *De occultis seu abditis, et manifestis medicamentorum facultatibus* Schegk maintains that the temperament of the mixture determines the substantial form, which in turn determines the further accidents that belong to the natural thing (Schegk, 1585, 26). In particular, diachronic downward causation is described as being relevant for the generation of plant-based medicaments. In the first instance, downward causation affects the temperament of elementary qualities: “The soul of rhubarb is the cause of proper and ordinary temperaments without which rhubarb could not have its forces and potencies”[[32]](#endnote-32) (ibid., 89). But given the potency of the temperament of generating substantial forms, this change of temperament can also bring about the generation of the substantial form of a plant part. Thus, the juice of rhubarb possesses a “form that it receives from the soul and that can subsist without the soul”[[33]](#endnote-33) (ibid., 90). Likewise, Schegk conjectures that water-hemp and absinth do not make our body dry and hot because they are dry and hot but because they have a potency that derives from their substantial form that constitutes their essence (ibid., 30).

Moreover, as Schegk explains, when the soul produces posterior and perfect forms in similar plant parts, the forms previously inhering in these parts are thereby not abolished. Rather, the posterior form existentially depends on the previous forms such that, if the previous forms were abolished, the more perfect form would perish as well. This is what Schegk has in mind when he says that the previous forms stand in the relation of mediate matter to the perfect forms (ibid., 42). He therefore describes diachronic downward causation as a process of perfecting some previously existing forms:

In this way, the posterior does not arise out of the prior but arises and is generated after that which is prior, such that its coming into being is nothing but that the prior is perfected by the posterior, as when we say that out of a boy there arises a man, not as if the subsequent perfection of the man would destroy the nature of the boy but that he perfects it with the degree of age.[[34]](#endnote-34) (Ibid., 43)

This analysis of downward causation adds something significant to the view of downward causation articulated by Philoponus. While Philoponus focuses on physiological changes brought about by emergent mental potencies and the role of these physiological changes in the material causation of emergent mental potencies that occur at a later point in time, Schegk focuses on physiological changes brought about by emergent vegetative and sensitive forms and the role of these physiological changes in the material causation of non-mental emergent substantial forms that occur at a later point in time. Moreover, he analyses these non-mental emergent forms as resulting from forms that emerged from the mixtures constituting plant parts even before the emergence of vegetative and sensitive potencies of the plant.

Before leaving the issue of the circle of upward and downward causation, it will be useful to point out that Schegk’s ontology of a plurality of forms connected with this view of a causal circle is put to various explanatory functions. First, it is used to explain why the prior forms persist when the posterior forms are destroyed: even if the posterior forms are required for the changes in the physiology from which the modifications of the prior forms emerge, these modifications persist as long as their physiological basis persists (ibid., 44). In particular, this applies to medical powers of plants: even when the vegetative soul perishes, the substantial forms of the parts of the plant can persist (ibid., 45). Second, the plurality of forms of plant parts explains why different plant parts have different medical powers (ibid., 77). Thereby, the powers of plant-based medicaments are explained through the agency of their substantial forms. This, then, is a further example for the emergence of novel causal powers: these medicaments have causal powers that cannot be reduced to the causal powers of elements or mixtures. Third, the activities of emergent forms always depend on the presence of a suitable temperament: “Because natural substances are generated together with matter, their function and actions can be hindered, in such a way however that the substance does not decay or perish …”[[35]](#endnote-35) (ibid., 28). This is why different temperaments of the patient can lead to different actions of the same medicament (ibid., 132). The only condition that has to be fulfilled is that matter is not divided beyond the size of a natural minimum understood as the minimal portion of suitably organized matter capable of sustaining a substantial form of a particular kind (ibid., 79).

6. Schegk on Unity and Substantiality

Schegk thus has developed a sophisticated conceptual framework to characterize the relation between the constituents of plants and the causal properties emerging from the causal properties of the constituents. Does this conceptual framework offer the theoretical resources needed to counter Fernel’s critique of the tradition originating with Alexander of Aphrodisias? Characterizing the emergence relation as a relation in which something substantial arises from something non-substantial, as Schegk does (Schegk, 1550, 143–144), and characterizing emerging forms as substantial forms implies a clear commitment as to the categorial status of these forms and the composites informed by them. In particular, this applies to plant-based medicaments. Schegk ascribes the purging power of rhubarb or the power of water-hemp to strengthen the liver to the presence of a *logos* or substantial form (Schegk, 1585, 31) and holds that such medicaments form genuine unities (ibid., 36). However, in which sense does he ascribe substantiality and unity to medicaments and other composites?

Schegk seems to have been aware of the unity problem since in *De purgantibus medicamentis* (1585) he addresses the problem of the unity of the soul. As he holds, the soul is nothing but the entirety of new causal powers arising from the instrumental causes: “The soul itself is nothing other than all of its potencies”[[36]](#endnote-36) (ibid., 218). Obviously, this suggestion seems to pose the threat of a mere unity by aggregation. This would be the case if the constituents of the soul were nothing but a collection of powers. However, Schegk takes the causal powers that constitute the soul to emerge from all elementary constituents taken together. This seems to be the consequence of his conception of mixture, where he opts for the view that in genuine mixture (as opposed to the mere juxtaposition of particles) the constituents as wholes undergo change, in the sense that change occurs in their minimal parts (Schegk, 1550, 215). Schegk’s thought seems to be that, because such powers originate from a change in all of the minimal parts of a mixture, the only location that can be assigned to these powers is the location of the whole mixture. This may be why Schegk claims that, if several powers emerge from the same mixture, they can be distinguished with respect to their effects but not with respect to their spatial location (Schegk, 1585, 220). Consequently, these powers “do not constitute substances that are separate from each other, because they do not enter into composition with matter but are rather immaterial *logoi*”[[37]](#endnote-37) (ibid.). Rather, they are “inseparable and undivided parts of a single essence, such that one is in another without mixture and without confusion and without separation, such that they are not substances composed out of matter and form, nor composed of quantitative parts”[[38]](#endnote-38) (ibid.).

To explicate the relation between different powers emerging from the same mixture, Schegk uses an example familiar from late Scholastic theories of sense perception. According to a widely shared view, sense perception involves an entity called “sensible species”, understood as structural features of a material medium such as a diaphanous body that are caused by and carry information about structural features of sensible objects.[[39]](#endnote-39) These entities behave unlike material objects because more than one of them can occupy the same place at the same time. For instance, sensible species relevant for visual perception that carry information about colors, shapes and quantities can be transported by light in such a way that in a transparent body indefinitely many of these species can occur at the same location (Schegk, 1585, 220–221). They can be said to be mutually contained in each other without undergoing confusion or mixture: none of them is occupies only a part of the location occupied by another; and none of them excludes the presence of any other; rather, each of them as a whole is contained in all of the others (ibid., 221).

Illustrating the relation between the potencies of the soul through the example of the relation between sensible species in a medium leads Schegk to a further comparison. As he notes, the relation that he has in mind corresponds closely to the Patristic notion of *perichoresis*: “The Greek theologians use ‘perichoresis’ to designate this unity of the multiplicity of some entity, by which all things are in all things without confusion, without mixture, without matter, and without quantity, and they use this term also in the explication of the mystery of the holy Trinity”[[40]](#endnote-40) (ibid.). Schegk gives a novel application to this notion when he suggests that *perichoresis* characterizes exactly the relation between new causal powers that emerge from their instrumental causes: The potencies that constitute the soul are “in each other without quantity and matter”[[41]](#endnote-41) (Schegk, 1585, 222); in this sense, they constitute a unity.

Something analogous holds for the unity of the potencies of the formative faculty:

The potentialities of all parts of the body transfer their actualities upon the seed, through which as an instrument something similar in species can be generated. Similarly, the species of the visible body causes vision through its actuality that it diffuses in the transparent part of the eye, in such a way that all external things seems to be contained within the confines of the eye … For in the transparent part of the eye, diffused through the actuality of the visible body, all things are in all without quantity, without part, without mixture, without confusion, as wholes in the whole of others …[[42]](#endnote-42) (Schegk, 1580, sig. [A8r])

This non-quantitative conception of both the actualities generated by visible species in the transparent part of the eye and the actualities generated by living beings in their seeds implies a notion of unity akin to the notion of *perichoresis*. As Schegk expresses the point of the analogy between formative powers and the actualities produces by visible species: The *logos* of the seed possesses no quantity and no quantitative parts but rather exists “as a whole in the whole” (ibid., sig. [A8v]).

 Thus, Schegk has a carefully developed notion of unity that applies in similar ways both to souls and to the plastic *logos* contained in seeds. Is this notion sufficient for specifying a notion of substantiality? Schegk cautions us that the unity displayed by the actualities caused by visible species is only a unity of accidents. As he argues, this is so because these actualities exist only as long as the visible species emanating from visible objects continue to act upon the eye. Because they depend on their causes for their continued existence, they are accidents and not substances (ibid., sig. [B1r]). This, however, indicates a sense in which the unity of the potencies of the plastic *logos* can be understood as giving rise to substantial unity: The potencies that constitute the plastic *logos* are separable from their primary actualities because they have a material substrate that can be separated from the living beings that have produced the seed.[[43]](#endnote-43) Unity together with persistence independence of the material substrate from which the powers that form a unity emerge thus seems to be what explicates the substantial nature of the seeds endowed with plastic faculty.

As far as I can determine, Schegk does not discuss the notions of unity and substantialitywith respect to the substantial forms of medicaments. Still, placing the discussion of the unity characteristic of the soul and the plastic *logos* into the context of a work on purging medicaments suggests that Schegk regarded his discussion as pertinent also for the question of the unity of medicaments that act by means of their substantial form. In any case, nothing in Schegk’s natural philosophy seems to prevent the application of this conception to the substantial forms of other composites. And what is more, the criterion of persistence independence applies to the separable plant parts with persisting substantial forms of their own. Thus, Schegk’s natural philosophy seems to contain the theoretical tool that could serve to analyze the unity and substantiality of medicaments that are active by means of their emergent substantial forms, as well.

7. Conclusion

By now it should be clear that Schegk develops a version of emergentism that diverges in some significant respects from Fernel’s reading of Alexander of Aphrodisias. According to Fernel, Alexander is committed to the view that the *only* cause of substantial forms is the temperament of elementary qualities, and Fernel considers only the direction of causation that leads from the temperament to the substantial form. By contrast, considerations concerning the origin of the capacity of living beings to act upon themselves lead Schegk to the view that, even if substantial forms of composites that are incapable of acting upon themselves could emerge from the temperament alone, the emergence of substantial forms of living beings requires an external cause that constantly prevents the occurrence of a stable equilibrium between elementary qualities. This seems to be the reason why Schegk subscribes to the theory of innate heat, understood as a non-elementary quality that functions as a “containing” cause. To be sure, innate heat does not emerge from elementary heat, but together with the elementary qualities it is one of the natural causes that educe from the potencies of matter new potencies that constitute the substantial forms of living beings (other than humans). Moreover, in his view the substantial forms of living beings subsequently play a role in downward causation in so far as they, together with the temperament of elements constituting organic parts and previously educed substantial forms of plant part, they bring forth novel substantial forms of more complex plant parts. Since these forms can persist even when the body part is separated from the living being, emergent forms can explain the powers of the plant-based medicaments.

Schegk’s natural philosophy also offers the theoretical resources to respond to the two problems identified by Fernel—the Substantiality Problem and the Simplicity Problem. Schegk would certainly concede that the potencies that arise through emergence always belong to the realm of qualities. However, he would contend that the emergence of several new potencies in the same process can give rise to a conception of unity and substantiality. This is so because he regards the new qualities not as mere collections of potencies but rather as potencies that cannot be assigned different spatial locations. Thus, the impossibility of distinguishing the new qualities spatially from each other brings in unity. Does the unity that Schegk has in mind fulfil the demands of simplicity raised by Fernel? The answer seems to have to be affirmative since Schegk uses a relation traditionally applied to the analysis of the simplicity of the divine nature—if the three persons of the Trinity possess simplicity due to *perichoresis*, so do Schegk’s emergent potencies that constitute the soul. Does the unity of emergent potencies that Schegk has in mind fulfil the demands of substantiality raised by Fernel? Again, the answer seems to have to be affirmative since Schegk distinguishes the unity of the purely qualitative actualities of visible species in the transparent part of the eye from the unity of emergent potencies in the seed since these potencies have material carriers that can be separated from the living beings from which they originate. The same holds for the pharmacologically operative plant parts. This suggests a notion of substantiality that combines unity of emergent potencies with existential independence of the material substrate from which these potencies emerge—a notion that can be applied not only to living beings and their seeds, but also to plant-based medicaments.

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1. On the role of Alexander in Pomponazzi’s thought, see Kristeller, 1951; Gilson, 1961; Pine, 1965. [↑](#endnote-ref-1)
2. Erastus, 1574. On Erastus, see Newman, 2006, ch. 2. [↑](#endnote-ref-2)
3. For a bio-bibliographic overview, see Melchior, 1620, 290–301. On the intellectual situation in sixteenth-century Tübingen, see Methuen, 1998. [↑](#endnote-ref-3)
4. See Ramus and Talon, 1577, 207–249; Schegk, 1570. [↑](#endnote-ref-4)
5. See Schegk, 1565; Schegk, 1566a; Schegk, 1566b; Simoni, 1566; Erastus, 1567; Schegk, 1568a; Schegk, 1568b. [↑](#endnote-ref-5)
6. “[C]ompositi formam vim quandam esse, ex subiectorum sibi corporum temperamento ac mistione. Subiecti enim ex mistione praeparationem, ipsamque potentiam cum ad absolutionem pervenerit, tum *entelecheian*, id est perfectionem fieri, quae rei sit forma. Ita formam de potentia materiae educi sentio, quod ispa potentia continenti progressione, transeat in formam, actusque fiat.” [↑](#endnote-ref-6)
7. “[I]lla ex corporis temperamento prodire videtur, ceu vis quaedam simplex ex subiectorum corporum temperie et concordi harmonia profecta … Sic enim compositae theriaces aut medicatae potionis vim, ex simplicium commistis temperatisque viribus extitisse intelligimus, quod cum Galeni etiam mente consentaneum est.” See also ibid., pp. 184/185. [↑](#endnote-ref-7)
8. “Necesse est eo quidem authore, subiecti praeparationem, non accidentem solum adiuvantemque, sed primam et efficientem causam statui: quippe quae de se omnem formae essentiam proferat ac suscitet. Simul vero ex subiecto sibi corpore, animam omnemque speciem emergere: et a corporum differentia, formarum varietates proficisci.” [↑](#endnote-ref-8)
9. See Fernel, 2003, 52, 66, 76, 78, 80, 92, 102, 108, 110, 118, 120, 124, 126, 128, 130, 132 etc. [↑](#endnote-ref-9)
10. Fernel, *On the Hidden Causes of Things*, p. 146/147: “[F]orma vero quae est a natura, proculdubio substantia est, quemadmodum et ipsa natura. Verum enimvero in igne quod et naturale et simplex corpus est, calorem et siccitatem speciem facimus, et ab iis atque in iis genitam levitatem.” See Alexander of Aphrodisias, 2008, 70–72 [*De anima*, 5.1–6]. [↑](#endnote-ref-10)
11. “His plane affirmat compositi naturalis formam esse substantiam, elementi, qualitatem …” [↑](#endnote-ref-11)
12. “Quandoquidem non potest ipsa species, per se seorsum a materia separata et abiuncta subsistere: utranque tamen substantiam esse non ambigimus. Nam sicut materia, ita et naturalis species substantia est: partes enim substantiae, substantiae sunt. Quinimo quia pars utraque substantia est, id quod ex ambabus constat, et substantia et una quaepiam natura est …” See Alexander of Aphrodisias, 2008, 72 [*De anima*, 6.1–6]. [↑](#endnote-ref-12)
13. “Hac ratiocinatione si demonstrat Alexander, naturalis compositi formam esse substantiam, eadem conficiet, ipsius quoque elementi speciem, ad substantiae genus esse referendam.” [↑](#endnote-ref-13)
14. “Ut enim substantiae essentiam nullum accidens explere potest, sic neque potest illa rerum *ousiodes*, id est, ut quidam loquuntur, essentialis differentia ex accidente constitui, quippe quod rei naturalis essentiam immutare nequeat.” See ibid., 176/77–178/79. [↑](#endnote-ref-14)
15. “Simplicia … corpora, quorum subiectum simplex est, simplicem quoque speciem et naturam adepta sunt. In quibus autem non simplex subiectum est, sed iam corpus aliquod, sive compositum: in iisdem species, ornatu distinctiore et compositiore perfectior est. Neque immerito: species enim illa, quae est in materia et in subiecto confert aliquid ad eorum speciem, quae composita sunt.” Alexander of Aphrodisias, 2008, 74–76 [*De anima*, 7.14–8.1]. [↑](#endnote-ref-15)
16. “Multitudo formarum, earumque diversa commistio, in subiectis corporibus aequabilem mutationis causam adferre potest.” See Alexander of Aphrodisias, 2008, 76 [*De anima*, 8.15–17]. [↑](#endnote-ref-16)
17. “Haec nonne plane loquuntur eorum quae miscentur, corporum formas etiam ipsas permisceri, et ex illis formam totius exurgere, quae sit ipsa quoque composita?” [↑](#endnote-ref-17)
18. “[E]st necesse, totius compositi unam esse formam simplicem, quae a simplicium partiumque formis diversa, illas incorruptas et integras in toto coerceat, alioqui perituras.” [↑](#endnote-ref-18)
19. See Schegk 1580, sig. L3r; Schegk, 1585, 289, 564, 567, 576, 586, 648–650, 731. [↑](#endnote-ref-19)
20. Schegk, 1580, sig. A2r; on the theological connotations of Schegk’s concept of an instrument, see Hirai, 2007, 380–386. [↑](#endnote-ref-20)
21. Solmsen, 1957. For critical discussion, see Preus, 1970, 35–38; Freudenthal, 1999, 19–29, 40–46, 114–129; Lennox, 2001, 229–249. [↑](#endnote-ref-21)
22. On Fernel’s theory of *spiritus*, see Walker, 1958; Bono, 1981; Clericuzio, 1988, 36–39; Bono, 1990, 356–364; Dessi, 1995; Hirai, 2005, 88–96; Blank, 2010; Deer Richardson, 2018, ch. 15. [↑](#endnote-ref-22)
23. “Has autem vector mundi spiritus, coelo in totam universitatem diffusus, rebus omnibus impertit, simul et speciem …” On Stoic elements in early modern theories of the substance of the heavens, see Barker, 1991. [↑](#endnote-ref-23)
24. “Corporea enim virtus, ut una cum corporis diminutione ac decessione descrescit & languet, ita accessione & incremento augetur & vegetior redditur, corpus autem quodlibet quantumvis magnum augeri potest, at vero nihil est quod Deo accedere possit, nulla re augeri potest, incorporeus igitur existit.” Translations from Schegk’s works are my own. [↑](#endnote-ref-24)
25. “Constat etiam ea quae contemperantur inter se primum minutatim dividi atque confringi, mox minimorum compositione actionem paulatim debilitari, atque habescere, nam integra viribus plus valent, & confestim ad agendum incumbunt, tertio, quasi consensione quadam in mixti totius corporis formam unam aliquam conspirare, cum agendo patiendoque prope paria, unum in alterius potestatem redigi nequeat.” See Todd, 1976, 158 [*De mixtione* 233.2–5]. [↑](#endnote-ref-25)
26. “Quaedam sunt naturales duntaxat formae, & sine quibus animatae non esse possunt. Naturales autem possunt esse sine animatis, ut quando desinit forma carnis animati. Utraque forma suam crasin habet, qua perempta perimitur etiam ipsius forma substantialis …” [↑](#endnote-ref-26)
27. “Ex quo par est intelligi animatam formam etiam esse physicam formam …” [↑](#endnote-ref-27)
28. “In natura nullam esse potentiam essentialem, sive sit manifesta, sive sit occulta, sine potentia naturali, aut impotentia, quae provenit in rebus naturalibus propter mixtionem quatuor elementorum, qua mixtione generantur etiam & corrumpuntur, ut instrumentali causa potentiae naturales.” [↑](#endnote-ref-28)
29. “quotquot formarum substantialium differentiae sunt, totidem etiam sunt temperamentorum ex elementis mixtorum quibus tales substantiae generantur differentiae …” [↑](#endnote-ref-29)
30. “*Emphytos* autem calor qualitas cum sit, in suo proprio subiecto ipsum necesse est inesse, quod ipsum nimirum est, *ton homophylon* causa concrementi quoad ut *eschate* seu *oikeia hyle* formae substantiali subijcitur. Antequam illud calidum sit perfectum, in materia ultima, non inerit ei forma … Simul ergo cum materia ultima forma nascitur, & simul cum ea interit, sic tamen, ut calor *emphytos* sit propria qualitas ultimae materiae, quae *oikeios* subijicitur nascenenti formae.” [↑](#endnote-ref-30)
31. Philoponus, 2013, 125 [771,21–772,3]. For detailed discussion, see Berryman, 2002. [↑](#endnote-ref-31)
32. “anima rhabarbari causa est crasews [sic] propriae & vernaculae, sine qua rhabarbarum vires suas & facultates habere nequit.” [↑](#endnote-ref-32)
33. “forma, quam accipit ab anima, & qua etiam sine anima subsistere potest.” [↑](#endnote-ref-33)
34. “Et hoc modo posterius non ex priore, sed post illud, quod prius fuit, fieri & generari dicitur, ut nihil aliud sit illud fieri, quam prius a posteriore perfici: ut si dicamus e puero fieri virum, non quod viri perfectio succedens, corrumpat naturam priorem pueri, sed quod cum gradu aetatis perficiat.” [↑](#endnote-ref-34)
35. “Quum enim substantiae naturales sint concreatae cum materia, & facultates & actiones earundem impediri possunt, ut tamen substantia earum non corrumpatur aut pereat …” [↑](#endnote-ref-35)
36. “Anima vero ipsa nihil aliud est, quam ipsius omnes potentiae …” [↑](#endnote-ref-36)
37. “Animam autem multis potentiarum *logois* definimus, qui tamen inter se separatas substantias non constituant, propterea quod sint non cum materia concreti, sed *ahyloi* quidam *logoi*.” [↑](#endnote-ref-37)
38. “sint unius essentiae inseparabiles & individuae partes, ut quarum una in alia insit sine mixtione & sine confusione, sineque separatione, cum non sint compositae tales substantiae ex materia & forma, nec sint compositae etiam ex partibus quantitatis …” [↑](#endnote-ref-38)
39. On the theory of sensible species, see Maier, 1963. [↑](#endnote-ref-39)
40. “Graeci theologi *perichoresin* appellant hanc unitatem multitudinis alicuius, qua omnia sunt in omnibus sine confusione, & sine mixtione, sineque materia, & sine quantitate, quo vocabulo utuntur etiam in explicando mysterio sanctae Trinitatis.” On the history of this notion, see Deneffe, 1923; Stemmer, 1983. [↑](#endnote-ref-40)
41. “quae in se mutuo sine quantitate & materia dicuntur esse …” [↑](#endnote-ref-41)
42. “Animati enim corporis omnium partium *dynameis*, suas *energeias* conferunt in spermate, quo posterius, tanquam instrumento, simile sibi in specie generare possit. Ut species aspectabilis corporis, sua energeia, quam diffundit in pellucido, visionem excitat, ut quae sunt extra, eadem omnia intra oculi complexu contineri videantur … Nam in pellucido, per *energeia* corporis aspectabilis diffusa, sine quantitate, & sine partibus, omnia sunt in omnibus sine mixtione, sine confusione, & tota in totis aliis …” [↑](#endnote-ref-42)
43. Ibid. [↑](#endnote-ref-43)