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Nicolaus Taurellus on Forms and Elements

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Argument

This article examines the conception of elements in the natural philosophy of Nicolaus Taurellus (1547–1606) and explores the theological motivation that stands behind this conception. By some of his early modern readers, Taurellus may have been understood as a proponent of material atoms. By contrast, I argue that considerations concerning the substantiality of the ultimate constituents of composites led Taurellus to an immaterialist ontology, according to which elements are immaterial forms that possess active and passive potencies as well as motion and extension. In Taurellus's view, immaterialism about elements provides support for the theological doctrine of creation *ex nihilo*. As he argues, the ontology of immaterial forms helps to explicate a sense in which creatures are substances, not accidents of the divine substance. In particular, he maintains that immaterial forms stand in suitable relations of ontological dependence to God: creation dependence (since forms would not exist without the divine act of creation), but neither subsistence dependence (since forms continue to exist without continued divine agency) nor activity dependence (since forms are active without requiring divine concurrence).

1. Introduction

The Altdorf-based physician and natural philosopher Nicolaus Taurellus (1547–1606) plays a somewhat enigmatic role in the development of early modern atomism.[1] Famously, he is a proponent of the view that the generation and decay of all natural things is due to the composition and separation of parts[2] – a view that played a crucial role in the formation of medieval and early modern corpuscular matter theory

[1] Taurellus studied philosophy at the University of Tübingen under Jacob Schegk and medicine at the University of Basel. He held a chair in ethics in Basel, and then from 1580 a chair in medicine and natural philosophy at the University of Altdorf. On Taurellus's biography, see Bayle 1730, 4: 327; Baier 1728, 1–14; Zedler 1732–1754, 42: col. 401–402; Schmid 1860; Mayer 1959; Mayer 1960. For the philosophical scene in sixteenth-century Tübingen, see Methuen 1998.

[2] For overviews of Taurellus's metaphysics, see Petersen 1921, 219–258; White Beck 1969, 117–121; Leinsle 1985, 1:147–165; Wollgast 1988, 148–153.

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and experimental "chymistry" (see Newman 2006, 69–79). This is how Taurellus formulates the hypothesis: "What is composite behaves in such a way that it does not exist as a singular thing but as a manifold brought into being by various principles, into which it can be dissolved again. For if things were born through the conjunction of parts, they decay through the separation of the same parts" (Taurellus [1573] 2012 [hereafter: *PT*], 256).[3] And drawing out the consequences of such a conception of composites, he holds that a human being, like any other composite being in the world, is not an *unum per se* (*PT*, 110).[4] Other proponents of the view that the generation and decay of natural things is due to the composition and separation of parts shied away from drawing such a counterintuitive consequence. For example, in his widely read *Initia Doctrinae Physicae* Philip Melanchthon maintains there are cases of mixture – in particular those relevant for the generation of living beings – where parts lose their membership in a natural species and give rise to a composite that belongs to a different natural species (Melanchthon [1549] 1555, fol. 195r-v). Similarly, Taurellus's teacher Jacob Schegk (1511–1587), whose philosophical rigor Taurellus greatly admired (see Taurellus 1597, sig. 4r; Taurellus 1603, sig. 4v), believed that, even if the parts of living beings and chemical substances retain their substantial forms, the entire composite possesses an immaterial substantial form that determines the structure of the mixture and thereby conveys substantial unity to the composite (Schegk 1585, 17–18). By contrast, Taurellus maintains that through composition no substantial form can arise and that, therefore, all composites possess no substantial unity but only accidental unity (*PT*, 274).

In spite of his own intention to provide a unified account of philosophical and theological truth and thereby to offer a philosophical defence of the doctrine of creation,[5] Taurellus's works triggered a long series of hostile responses from Lutheran theologians, which focused on two points: the charge that Taurellus's views are incompatible with the Lutheran conception of providence, and the charge that Taurellus's views are a hidden expression of atheism.[6] The latter charge certainly involves a misrepresentation of Taurellus's theistic ontology which, as we will see, is central for his arguments concerning the nature of elements. Also the former charge does not seem to have been perceptive since Taurellus accepts the idea of divine concurrent causation central to Lutheran accounts of providence (see Melanchthon [1549] 1555, fol. 28v-30v; *PT*, 144–148; 214; 464).[7] But there were also responses that relate more specifically to Taurellus's natural philosophy, and although it will turn

[3] "Quae composita sunt ita se habent, ut non unum quid existant, sed multiplex quiddam ex variis ortum principiis in quae vice versa resolvi possint: Nam si ex partium coniunctione res natae sint earundem secretione corrumpuntur . . . "

[4] On these aspects of Taurellus's thought, see Leinsle 1985, 1:160–162; Lüthy 2001, 281–283.

[5] For Taurellus's rejection of the doctrine of double truth, see *PT*, 250–252; on his project of providing rational support for the doctrine of creation, see *PT*, 220–222.

[6] Feuerlein 1734 contains a detailed account and refutation of these responses.

[7] For a discussion of the Lutheran doctrine of providence, see Bernhard 2008, 61–86.

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out that these responses, even if they, too, were misguided in some respects, will provide useful starting points for clarifying Taurellus's views concerning the ultimate constituents of reality and the theological motivations of these views. As Christoph Lüthy has pointed out, some of his contemporaries saw a connection between Taurellus's views and the views of two other controversial thinkers, the Arminian theologian Conrad Vorstius (1569–1622)[8] and the atomistic natural philosopher David Gorlaeus (1591–1612).[9] The connection between Taurellus and Gorlaeus seems to be particularly direct because Gorlaeus develops a long series of arguments in support of the claim that a human being is "one being by aggregation, not by essence" (*unum ens per aggregationem, non per essentiam*) (Gorlaeus 1620, 222–234).[10] Moreover, to spell out the implications of such a view of composites Gorlaeus presents a fully developed theory of material atoms, according to which nature is constituted by minimal, quantitative, indivisible, and corporeal particles interspersed with small regions of vacuum (ibid., 239–243). The close connection between the endorsement of the existence of material atoms and the denial of the existence of composite unities in Gorlaeus makes it tempting to conjecture that such a close connection could be found also in Taurellus.[11] Moreover, in critical responses to Vorstius, Taurellus has been charged with having been the author of the view that God is a limited quantitative being – a view that his critics also ascribed to Vorstius (see Anon. 1611, 8–9; Vorstius 1611, 22–23). Drawing such a parallel between Vorstius and Taurellus makes it tempting to conjecture that both thinkers understood God as being spatially separated from the universe.[12]

Yet, it would seem seriously misleading to ascribe an earlier, even if perhaps less coherently developed theory of material atoms to him. In this article, I will focus on his most sustained discussion of the nature of the ultimate constituents of reality, found in his first work, *Philosophiae Triumphus* (1573). As I will argue in section 2, for Taurellus the basic constituents of reality are immaterial, purely formal beings. Since in his view the essence of these formal beings is not changed when they enter composition, they indeed have an atomistic aspect to them. Nevertheless, they are not simple beings in the sense that they are resistant and therefore indivisible. Rather, they are simple beings in the sense that they are characterized by active and passive potencies and forces that cannot be separated from each other. What is more, while a theory of material atoms

[8] On the controversies concerning Vorstius, see Shriver 1970.

[9] On Gorlaeus, see Lasswitz 1890, 1:455–463; Gregory 1966, 46–51; Hattab 2009, 168–172; Lüthy 2012.

[10] As Lüthy points out, the similarity between Taurellus und Gorlaeus on this issue has already been noted by the Utrecht theologian Gisbert Voetius; see Voetius 1643, 28, quoted in Lüthy 2012, 181, note 169.

[11] In fact, Christoph Lüthy suggests that Taurellus's ontology "entails a clearly atomist ontology. For an atomist framework is clearly guaranteed by a system according to which i) all *entia* are actually existing and numerically unique; ii) all compounds that result from them are mere *composita*, or *entia per accidens*; and iii) all natural entities, including prime matter, are fully actualized substances" (Lüthy 2001, 284). The substance of Lüthy's account of Taurellus's influence on Gorlaeus is included in Lüthy 2012, 122–129.

[12] As Lüthy suggests, "to treat God as a determinate quantity meant, for example, to localize the divine essence and to separate it from terrestrial events . . . or from the actions of men" (Lüthy 2001, 284).

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would connect coherently with a conception of God as a limited, corporeal being, such a view of the nature of the divine being does not seem to be present either in Taurellus or in Vorstius.

Still, Taurellus's analysis of the nature of elements is meant to explicate a sense in which created beings are separate from the divine being. What matters for him, however, is not spatial separateness but rather diversity of substance. As he argues, only an analysis of elements as something constituted by immaterial active and passive potencies and forces, in his view, can guarantee the substantiality of created beings because only then do elements stand in the right relations of ontological dependence to the divine being: they stand in the relation of creation dependence to the divine being because without an act of creation they would not exist; however, they do not stand in subsistence dependence to the divine being because they do not require any continued divine agency for continuing their existence; and they do not stand in activity dependence to the divine being because they are the source of their own active and passive potencies and forces. To develop these matters will be the task of section 3.

2. Forms and Elements: Taurellus's Immaterialism

In Taurellus's *Kosmologia* (1603), one finds a group of remarks on atoms and atomism that, as Christoph Lüthy has pointed out, pose a consistency problem. Taurellus remarks that "atoms are the principles of magnitude" and that everything "is composed out of first, minimal and individual parts" (Taurellus 1603, 145). Likewise, he remarks that these "individual parts" touch each other but do not become continuous, but remain merely contiguous, without merging into a single unity (ibid., 119). Yet, shortly before the first of these passages he also distances himself from atomism: "What is said about atoms from the position of the atomists, is irrelevant. For atoms are not the matter of the world or of the worlds to be brought into being" (ibid., 142–143).[13] Taken together, these passages are certainly bewildering because they seem to threaten Taurellus's ontology with inconsistency: the first two passages seem to imply a commitment to the view that atoms are the ultimate building-blocks of the compositional structure of the world, while the last passage seems to deny the reality of material atoms.[14]

The inconsistency, however, may be apparent only because the emphasis of Taurellus's disclaimer with respect to the doctrines of the atomists may concern exactly

[13] "Quod de atomis dicitur ex atomistarum sententia, nullius est momenti, non enim atomi mundi, mundorumve condendorum materia sunt." (Unless otherwise noted, translations are my own; for the passages from *PT*, I have consulted with great profit the German translation by Henrik Wels.)

[14] Lüthy seems to accept that there is a genuine inconsistency between these two passages, an inconsistency that, however, carries less weight given Taurellus's overall theological goals: "Taurellus' theologically motivated ontology happened to entail a doctrine of atomized matter. But both its provenance and its larger aims were such that it could owe but little to the view attributed to Democritus, Leucippus, Epicurus, or Lucretius" (Lüthy 2001, 286).

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the idea mentioned, namely, that atoms are the *matter* of the universe. Once one denies materiality to the ultimate constituents of reality, the claim that the ultimate constituents of reality possess some properties traditionally associated with atoms – being indivisible, being principles of magnitude, being capable of touch but not of fusion, being capable of motion – is compatible with denying that atoms are the matter of the universe. Of course, if this should turn out to be Taurellus's view, he would have to say something about how these properties could be understood as properties of immaterial entities. As it will turn out, Taurellus indeed does have something to say about these issues. But first it has to be established whether or not Taurellus is committed to an immaterialist conception of the ultimate constituents of reality.

In his later writings, there is little textual evidence to settle this issue in any definitive way. In *De Rerum Aeternitate* (1604), Taurellus reinterprets prime matter as "the nothing" out of which the world is created, and therefore denies that prime matter could be regarded as a constituent of created things, without however developing any sustained argument for either claim (Taurellus 1604, 420). Similarly, in a passage from his annotations to the *Opera Omnia* of Arnaldus de Villanova (ca. 1240–1311), Taurellus denies the reality of prime matter and claims that "it is the common opinion of physicians that there exists nothing prior to, nor more simple than the elements" (Arnaldus of Villanova 1585, col. 8).[15] In fact, the dismissal of prime matter and the adoption of the medical conception of elements is a move that is already found in Melanchthon's *Initia Doctrinae Physicae* (see Melanchthon [1549] 1555, fol. 110v). However, Melanchthon's motivation seems to have been an aversion against unnecessary curiosity rather than an insight into any substantive philosophical problems connected with the doctrine of prime matter (see ibid.). And there is no hint that Melanchthon intended to give any novel interpretation to the medical conception of the four elements (air, fire, water, earth). In both respects, Taurellus diverges from Melanchthon. To be sure, in his annotations to Arnaldus de Villanova's *Opera*, Taurellus does not expand on how the medical view relates to his own denial of the reality of prime matter. But he points out that he has given a demonstration of why there exists nothing prior to, nor more simple than, the elements, in two other works: his commentary on Hippocrates's *De natura hominis* and his *Philosophiae Triumphus* (Arnaldus of Villanova 1585, col. 8). Since the former work either has never been published or has been lost,[16] we have to focus on the latter work.

In fact, in *Philosophiae Triumphus*, Taurellus develops an intricate argument for denying that prime matter enters into the constitution of things. At the same time, while Taurellus accepts the traditional view that air, fire, water, and earth are the four elements, he offers a reinterpretation of the nature of these elements. The argument starts with a consideration of the motivation for introducing the notions of form and prime matter. As he describes it, the motivation arises out of the view that in

[15] "Sed vera haec est Medicorum sententia, nihil elementis prius et simplicius existere . . . " (Lüthy's translation).
[16] For a discussion of this point, see Lüthy 2001, 285, note 141.

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natural things there are contrary properties: active properties such as the capacity of bringing forth changes in other things, and passive properties such as the capacity of undergoing change through the agency of other things. If these properties are understood as contrary, then they seem to require two different origins (assuming that no single origin can bring forth contrary properties). For this reason, the active properties of natural things were seen as requiring the existence of forms, while the passive properties of natural things were seen as requiring the existence of primary matter (*PT*, 292). However, Taurellus challenges the assumption that active and passive properties of natural things should be regarded as contraries. This is why: "Nothing takes on its contrary but rather cedes when the contrary comes; but passivity increases with the increase of activity" (*PT*, 284).[17] Hence, his argument against the contrary nature of active and passive properties is that an increase of passive power is compatible with an increase of active power. But if activity and passivity are not contraries, "they are present in the same subject and proceed from the same cause" (*PT*, 292).[18] At the same time, Taurellus holds on to the assumption that the active properties of things have to be explained by the existence of an active principle. This is why he does not eliminate the notion of form from his ontology. On the contrary, because active and passive properties are not contraries, he believes that they proceed from forms alone: "We say that a thing is active and passive with respect to the same form; but in such a way that action is its proper effect, while the other does not arise from matter conjoined with it but from an externally existing contrary principle" (*PT*, 294).[19]

Regarding forms as the unique kind of origin of the active and passive properties of natural things also leads to a reinterpretation of the compositional structure of the world. Clearly, it implies that natural things cannot be understood as composites of form and prime matter. This is why, in Taurellus's view, forms are the only beings underlying the compositional structure of the world: "Matter plainly does not exist, and nothing but forms can be and can enter composition" (*PT*, 280).[20] And again: "[O]nly forms can be conjoined and can compose a whole" (*PT*, 278).[21] Accordingly, "mixture or composition is . . . a mere conjunction of forms that in no way changes them" (*PT*, 276).[22] At the same time, understanding composition in this way implies that through composition no new form arises that could confer genuine unity onto the composite:

[17] "Nihil enim suum suscipit contrarium, sed cedit potius eo veniente, cum tamen passio pro actionis incremento augescat."
[18] "eidem insunt subiecto, ab eademque causa prodeunt . . . "
[19] "Sic ab una eademque forma rem agere dicimus, eiusdemque pati respectu, sed ita ut actio proprius sit illius effectus, haec vero ipsi non a sibi coniuncta materia, sed extrinsecus existente principio contrario proveniat . . . "
[20] "materiam plane non existere, nilque praeter formas vel esse, vel componi posse . . . " This view is reaffirmed at *PT*, 300.
[21] "solae siquidem formae coniungi, totumque componere possint . . . "
[22] "Mixtio vel compositio . . . mera est formarum coniunctio, ipsas nequaquam immutans."

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> What is one in itself, can for this very reason not be many, such that if the unity is substantial the multiplicity must be accidental. Therefore we do not attribute composition to form itself, because it is one, and without multiplicity nothing can be or be understood to be composite; rather, we say that it is an accident of it. (*PT*, 274)[23]

Hence, composition itself is an accident that belongs to a multiplicity of genuine unities, and the changes that relate to the composition and separation of parts take place on the level of accidents.

Taurellus uses the idea of a hierarchy of forms to explicate a sense in which one can speak about matter without being committed to matter as a constitutive principle of natural things. His reinterpretation of secondary matter in terms of subordinate forms allows Taurellus to continue to talk about bodies (*corpora*) and corporeal beings (*entia corporalia*) (see *PT*, 160–162; 182; 352–354; 552–554). As he puts it, "if it is not understood as a less noble form, . . . matter does absolutely not compose anything" (*PT*, 278).[24] Thus, there is a sense in which one can talk about matter which uses a traditional connotation of the notion of matter, namely, that it is something less noble that underlies something more noble (see *PT*, 296). Thus, even if the idea that prime matter underlies form is given up, the structure of something less noble underlying something more noble can be upheld. More specifically, less noble forms can be understood as the subjects of more noble forms. In Taurellus's view, things receive the character of subjects "for the same reason that makes that they are less noble, such that forms that are within nothing else but serve as subjects for something else are the most ignoble, but those that do not serve as subjects for anything else but are within something else are more noble" (*PT*, 330).[25] Here, Taurellus takes up an idea that is already found in the work of Schegk but also modifies it in an interesting way. To get a grip on the parallels and differences between Schegk and Taurellus on these issues, it will be useful to consider some details of Schegk's account of mixture.

Schegk took a keen interest in the work of Alexander of Aphrodisias (fl. ca. 200 AC) and published a Latin translation of Alexander's *De mixtione*. The core idea of this work is expressed in the following account 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

[23] "[Q]uod per se unum est, eadem ratione multa esse non posse, ut si unitas sit substantialis, multitudo accidens esse debeat. Quamobrem non ipsi formae compositionem attribuemus cum una sit, et sine multitudine nil quicquam compositum vel esse, vel intelligi possit, sed eius accidens esse dicemus."
[24] "materia . . . nisi pro forma ignobiliori sumatur . . . nihil omnino componat."
[25] "qua minus sunt, quae nullis insunt formae, sed aliis subiiciuntur, ignobilissimae sint, quae vero subiiciuntur nulli, sed insunt, nobiliores, magisque caeteris existant."

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> composition of minimal parts . . . , and third, as it were through some agreement, they jointly bring about a single form of the entire mixed body. (Schegk 1540, fol. 65r)[26]

Similarly, 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. (Schegk 1585, 122)[27]

Schegk points out that this conception of the origin of animate forms has the consequence that "an animate form also is a physical form" (ibid.).[28] In fact, such a view of the origin of souls is found in Alexander's *De anima*. 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 [1495] 1559, 78; cf. Alexander of Aphrodisias 2008, 104 (*De anima* 25.6–8).[29] As Victor 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). 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 characterizes Alexander as one of the ancient thinkers who were committed to emergentism (ibid.).

Within this emergentist framework, Alexander maintains that the notion of matter can be applied not only to characterize primary matter and secondary matter (understood as primary matter informed by elemental forms) but also as a relative notion that can characterize the relation between higher and lower levels of beings. Alexander explains that if the soul is understood as a form that supervenes upon the mixture of simple bodies and their temperament, then "no doubt this temperament by its essence plays the role of matter" (ibid., 79).[30] Somewhat differently, Schegk suggests

[26] "Constat etiam ea quae contemperantur inter se primum minutatim dividi atque confringi, mox minimorum compositione actionem paulatim debilitari . . . , tertio, quasi consensione quadam in mixti totius corporis formam unam aliquam conspirare . . . " Cf. Todd 1976, 158 (*De mixtione* 233.2–5).

[27] "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 . . . " Note, however, that Schegk makes an exception for immortal human souls (see Schegk 1580, sig. B4v-B5r; Hirai 2007, 396–398).

[28] "Ex quo par est intelligi animatam formam etiam esse physicam formam . . . "

[29] "Est enim vis & forma, quae per eiusmodi mistionem ex corporum temperamento supervenit: non autem ratio aut compositio temperamenti."

[30] "proculdubio temperamentum illud materiae rationem habebit essentia."

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that the forms that are dominated by the most perfect form of the entire composite behave "as if they were the mediate matter [*materia mediata*] with respect to the perfect forms" (Schegk 1585, 42). What these two versions of a relative notion of matter have in common is that the subordination relation is analyzed in terms of final causation. As Alexander puts it: "An entelechy and perfection is of such a nature that it cannot exist without that to which it belongs, very much like a limit cannot exist without that whose limit it is" (Alexander of Aphrodisias [1495] 1559, 76; cf. Alexander of Aphrodisias 2008, 90 (*De anima* 17.12–14).[31] Likewise, Schegk writes: "Some forms are said to arise later, and as it were with the advent of some perfection, such that the later form does not destroy the earlier form but rather perfects it" (Schegk 1585, 42).[32]

As we will presently see, Taurellus accepts some aspects of emergentism. However, what he clearly rejects is the view that souls could emerge from the mixture of elements. As he puts it: "Soul is not so earth-like that it would arise out of the seed or that it would decay together with the body" (*PT*, 168).[33] More generally, he rejects the view that substantial forms could emerge from the mixture of elements: "Because through generation something arises that is really one, viz., substantial form, we hold that this is not simple with respect to the conjunction or some other accident and also not composite, whether it arises from a single being or from many beings" (*PT*, 274). Moreover, as he makes clear immediately afterwards, the situation in which something simple arises out of many beings is a situation in which a mixture is resolved into its elementary components (ibid.). Consequently, Taurellus cannot invoke the idea that, by emerging from the temperament of elements, a substantial form confers perfection upon the elemental forms. This is why he offers a different explication of the sense in which the less noble forms could be regarded as the "matter" of the nobler forms:

> If a form is by itself less noble, as water undergoes change more easily than fire, why does it undergo these changes accidentally and not in the same way simply by itself? Substance means what is expressed by itself or simply, but accident what is understood with respect to something else, such that if this belongs to the form by itself, it has to be ascribed with stronger reasons to the form. Therefore we say that the form is less noble such that it can receive effects itself, simply, and not accidentally, or with respect to something else, and that a form is more noble or less noble when it is compared with another form, such that it receives effects faster or with greater difficulty. (*PT*, 298)[34]

[31] "Talis enim est entelechia & perfectio, quae absque eo cuius est, esse non potest: quemadmodum neque terminus, absque eo, cuius est terminus."

[32] "Aliae autem formae dicuntur posterius fieri, & quasi successione quadam perfectionis, ut posterior non perimat priorem formam, sed eam perficiat . . . "

[33] "nec terrena sit anima, ut ex semine oriatur, nec in corpore intereat . . . "

[34] "Si per se forma sit ignobilior, ut igne magis aqua patiatur, cur per accidens, & non eodem modo simpliciter ipsa pateretur? Substantiam quod per se, vel simpliciter exprimitur, denotat, sed accidens, quod respectu alterius intelligitur, ut si hoc formae per se competet, illud eidem multo potiori ratione sit attribuendum. Formam itaque per se, simpliciter, non secundum accidens, aut alterius respectu ignobiliorem ut pati possit, nobiliorem vero vel ignobiliorem si alteri conferatur, ut citius vel difficilius patiatur, esse dicimus . . . "

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According to this line of thought, a form is more noble than other forms if it is more prone to cause changes in other forms, and form is less noble than other forms if it is more prone to receive the effect of the activities of other forms. Passive changes of forms thus are seen as a result of the contingent activity of other forms together with the internal constitution of the forms that have undergone change. In this sense, in Taurellus's view the subordination relation between substantial forms reduces to relations of efficient causation between substantial forms.

The ensuing view of the nature of elements is one that ascribes the origin of all activities found in the corporeal world to the activities of immaterial forms. This becomes clear when Taurellus uses a thought experiment to argue against the assumption that the most common activities of bodies should be ascribed to prime matter and only the activities that are specific to a different kind of bodies should be ascribed to immaterial forms:

> In addition to the reason for which we have rejected matter, one can see the absurdity of this assumption from the fact that whatever comes into being somewhere is a singular thing, such that the common nature of the activities does not make any difference. This holds because a multiplicity does not constitute things nor is it operative, nor does it change their actions. (*PT*, 346)[35]

As an example, Taurellus uses the qualities of the element earth: it is touched and moved, cold and dry. The view that he criticizes would ascribe the qualities of being touched and moved to prime matter because these qualities are shared by other elements and only the qualities of coldness and dryness to form because this combination of qualities is specific to earth. To undermine this view, Taurellus asks us to consider a counterfactual one-element universe: "Assume that nothing but earth would exist, which could bring forth these activities, would you not attribute the activities that belong only to earth to its form?" (*PT*, 348).[36] The implication of this thought-experiment seems to be that, if in a one-element universe there is no reason to ascribe the qualities of being touched and moved to prime matter, then there is also no reason to make such an ascription in the real universe because the constitution of other elements does not contribute anything to the constitution of the element earth.

Consequently, Taurellus ascribes to forms qualities that are traditionally ascribed to prime matter: "The constitution that can be ascribed to form without matter is such that it is both touched and moved" (*PT*, 348).[37] Of course, one may wonder whether immaterial forms are the right kind of entity to be touched and moved. For instance,

[35] "[P]raeter ea quibus materiam supra refutavimus, haec absurda esse conspiciuntur, quod singulare sit, quicquid modo fit usquam, ut nullam actionum communitas differentiam faciat, tum quod multitudo res nec constituat, nec operatur, aut ipsas immutet actiones . . . "

[36] "At si (causam ponito) praeter terram nihil existere, quod eas exerere posset actiones, an eas ideo quod solius essent terrae, eiusdem formae tribueres?"

[37] "Talis enim est rei constitutio quae formae sine materia possit adscribi, ut et tangatur, et moveatur."

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Alexander denies that souls have by themselves a capacity of motion (Alexander of Aphrodisias [1495] 1559, 77; cf. Alexander of Aphrodisias 2008, 98 [*De anima* 21.22–22.7]). However, Alexander presents this as an immediate consequence of his view that, because souls supervene upon the mixture of elements, they cannot be separated from the body (ibid.). Once this view is rejected, there is no need for denying to substantial forms the capacity of local motion. The only qualification that Taurellus adds to his view that substantial forms are capable of motion is that souls that possess sensation and will are not moved by necessity, as inanimate substantial forms are, but rather by their own free will (*PT*, 350). Things may be more puzzling with respect to the capacity of touch, and indeed Taurellus seems to have been aware of this difficulty when he writes "In some sense, incorporeal beings also show the capacity of touch, both because they move the bodies with which they are joined, and because the soul is in various ways afflicted by some demons" (*PT*, 352).[38] Thus, the capacity of touch reduces to relations of efficient causation both between soul-like substantial forms and between the souls and subordinate substantial forms that constitute the human body.

What is more, Taurellus regards the activities of substantial forms as the origin of all of the forces found in the natural world: "Nature is the unique principle of corporeal things and consists in a single substance, not in two or three substances. This substance seems to be manifold because it expresses itself in various forces" (*PT*, 376).[39] But how should the relation between the variety of physical forces and the activities of substantial forms be characterized? Interestingly, in this respect Taurellus takes up an aspect of emergentism, and here it becomes clear that he accepts a notion of composite form, as long as composite forms are not regarded as something substantial:

> When by mutual action and passion the mixed things are changed in such a way that none of them remains entirely the same, but some new form arises out of it that is related to the forces of all of them, without doubt there exist mixed forms that have the forces of many, bring about different effects, which is most evident in the changes of things and especially in the use of medicaments: Nevertheless, if this is accepted, then the metaphysical axiom has to be rejected according to which ONE and BEING have the same meaning, such that whatever exists is not many but only one: For multitude is not substance but quantity. (*PT*, 272)[40]

[38] "Tactum etiam demonstrant aliquatenus incorporea, tum quod assumpta moveant corpora, tum quod anima varie a daemonio quibusdam affligatur . . . "

[39] "unicum rerum corporearum naturam principium esse dicimus, non duabus aut tribus, sed una constans substantia, quae cum variis se prodat viribus multiplex esse videtur."

[40] "Cum . . . actione mutua, et passione res mixtae sic immutentur, ut earum nulla integra maneat, sed nova quaedam forma inde oriatur quae vires omnium referat, dubium non est quin compositae sint formae, quae multarum vires habent, differentesque proferunt effectus, quod in rerum mutationibus, tum maxime usu medicamentorum est evidentissimum: Hoc tamen si admittatur Metaphysices axioma reprobabitur, quod UNUM et ESSE idem valere dicuntur, ut quicquid est non multa, sed unum sit tantummodo: Non enim substantia, sed quantitas est multitudo."

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Accordingly, what emerges from the mixture of elements is a plurality of novel, but non-substantial causal powers. To be sure, Taurellus does not go into a detailed analysis that tells us how exactly different higher-level causal powers arise from the active powers of elements. But at least he indicates a sense in which his immaterialist account of elements can provide an ontological framework for understanding the origin of the causal powers of composites – these powers can be understood as supervening upon and emerging from the tempering of elemental qualities without, however, thereby giving rise to a novel kind of substance.

The passage just cited may be remarkable in a further respect. Taurellus's own subject index refers to this passage as the only one in the entire book that explicates the nature of quantity (*PT*, 588). This is why his remark about quantity may bear more weight than may be obvious on first sight. The view that is implied by the rejection of the axiom of the equivalence of one-ness and being is that multitudes can be regarded as real beings because they possess causal powers that none of their constituents possess. Moreover, in the final remark of the passage quantity is clearly attributed not to substances but to beings that are constituted by a multitude of constituents. Taken together with its immediate context, this remark may suggest that quantity, like the pharmacological powers of medicaments, could be regarded as one of the causal powers that supervene upon the mixture of elements. If this is what Taurellus has had in mind, then extension could be understood not as a property of immaterial forms themselves but rather as an emergent property that their composition brings about.

Certainly one may have wished that Taurellus had clarified in more detail the relation between the active and passive features of immaterial forms and the observable qualities and powers of the corporeal world. Nevertheless, there is strong textual evidence that indicates that Taurellus's ontology does not imply anything like material atomism. Rather, the only entities that at a basic level underlie the compositional structure of the world are form-like elements. As it will turn out presently, his immaterialist conception of the compositional structure of the universe is crucial for understanding how Taurellus believed that his conception of the ultimate constituents of reality could support his goal of providing a philosophical foundation for the doctrine of creation. In his view, only forms have the right kind of ontological dependence on God – a kind of dependence that supports the doctrine of creation and excludes the alternative doctrine of natural things as eternal divine attributes. To substantiate this suggestion, we will have to proceed step by step.

3. Forms and Elements: Taurellus's Theological Motivation

Let us start with the view that Vorstius's critics ascribed both to Vorstius and to Taurellus: the view that God is a *quantum* that is limited and possesses accidents. As it turns out, such a reading does not adequately represent either Vorstius's or Taurellus's views concerning divine extension. Vorstius holds that God is infinite not only with

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respect to duration and potency but also with respect to omnipresence (Vorstius 1610, 221).[41] Because God is omnipresent, there is a quantitative aspect to his nature; however, Vorstius is clear that "this does not relate to physical or corporeal and sensible quantity but has to be understood with respect to the true and by no means fictional but evidently for us imperceptible and spiritual magnitude of God" (Vorstius 1611, 2).[42] Also, Vorstius emphasizes that he "never claimed that God is finite unless perhaps in the sense that God is a definite being, that is, a determinate being on its own that is distinct from other beings" (ibid., 2–3).[43] Accordingly, when Vorstius talks of the "place" of God, he does not mean any physical place in the Aristotelian sense – a place defined by the boundaries of other bodies – but rather wishes to express the view that God extends throughout the whole of space (ibid., 3).[44]

On first sight, the views of Vorstius may seem to differ from Taurellus's conception of divine infinity, because Taurellus's conception seems to involve a sense in which God is a material being. Consider the following passage: "We say that God is almighty both in the sense that he has an infinite potency due to his substance, and in the sense that he also has infinite matter due to his essential characteristics, that is, one that in no way hinders the agent through any potency of acting" (*PT*, 484).[45] However, although infinite matter, in a certain sense, here seems to be included among the essential characteristics of God, Taurellus gives an explication that clearly marks talk of "infinite matter" as metaphorical. "Infinite matter" as a metaphor for the infinite divine potencies indicates that there are no further potencies that could function as an external impediment to divine agency. Such a metaphorical usage of the notion of infinite matter evidently does not imply that God has material (and, hence, limited) properties. Likewise, Taurellus suggests a metaphorical usage of the notion of prime matter. As he puts it, with respect to God prime matter is "the NOTHING" (in capital letters) out of which God creates the world (ibid.).

The connection that Taurellus establishes between the notion of prime matter and the notion of nothing strongly differs from the use of the epiteton "nothing" that is often attributed to matter in the Neoplatonic tradition. In the sixteenth century, there were at least two influential ways of explicating the idea that matter is something that lacks positive determinations. Perhaps the most careful early modern statement of the

[41] "Deum triplici ratione infinitum esse affirmo, duratione, omnipraesentia, & virtute."

[42] "id … a me declaratur, ut nihil ad quantitatem hanc physicam, seu corpoream & sensilem pertinere; sed de vera tantum, & minime fictitia, attamen plane nobis imperceptibili, & mere spirituali, *Dei magnitudine* accipiendum esse … "

[43] "*Finitum vero Deum esse*, nusquam a me ipso dicitur: nisi fortassis talis eo sensu, quo *finitum* pro ente *definitio*, hoc est certo, proprio, & ab aliis distincto sumitur."

[44] "[Q]uod de *Loco & habitatione Dei* … disseritur, id non de aliquo physico loco qualem Aristoteles nobis in 4. Physicorum descripsit; sed … generatim de spacio abstractissime sumpto, quod Deus suo divino modo adimpleat, (ut quidem vulgo tradunt, Deum esse in omni loco repletive) … "

[45] "Deum itaque omnipotentem esse dicimus, tum quod infinitam pro substantia potentia habeat, tum quod materiam suarum ope rationum pariter infinitam habeat, id est: quae nulla penitus agendi facultate operantem impediat: Nec est quod non impedire quidem, sed iuvare quis existimet."

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first way of explicating this idea is found in Carolus Bovillus's *Libellus de nihilo* (1509).[46] As Bovillus explains, what is meant by calling matter "nothing" is that matter by itself lacks differentiation into individual entities and that matter, for this reason, can be described only by means of negations (Bovillus [1509] 1510, fol. 63v). Nevertheless, he suggests that matter possesses reality in the sense of being an undifferentiated mass in which all beings are potentially contained and out of which all beings arise (ibid.). In his view, matter also possesses permanence in the sense that it was created at the beginning of the world and is immune to corruption (ibid., fol. 64r). Accordingly, he emphasizes that matter is not altogether nothing but rather occupies an intermediary position between being and nothing: strictly speaking, it is not nothing but "close to nothing" (ibid., fol. 63v).

A different version of Neoplatonic matter theory was first formulated by the sixth-Johannes Philoponus, a sixth-century commentator on Aristotle, and made prominent again in Gianfrancesco Pico della Mirandola's *Examen vanitatis doctrinae Gentium* (1520). Philoponus understands prime matter as something undetermined *except* for its three-dimensional characteristics.[47] Still, three-dimensional extension is thought of as being connected by its nature with forms. As Pico emphasizes, according to Philoponus, "space is a place that, even if by itself it is vacuous of body, nevertheless is never an actual vacuum, just as we say that matter differs from form but is never devoid of form" (Pico della Mirandola [1520] 1573, 1189).[48] In fact, Philoponus maintains that the dimensions "are not without body but in the body" (Philoponus 1554, fol. 83v).[49] As he points out, this is what sets his view apart both from Aristotle's conception of place as the surface of the surrounding bodies and from the atomists' conception of a vacuum as an immaterial receptacle of bodies. His argument for the mutual existential dependence between extension and body concerns the conditions for the activity of forms and for the divisibility of bodies:

> Matter is the cause why forms are active and passive ... And contrary forms would not receive effects from each other if the efficient cause and the passive cause were not in matter; that is, if in matter there were no natural affections; this is why if this threefold dimension ... is incorporeal and devoid of matter, also a body that enters it and is located there would not produce any effect in it nor receive any effect from it. For only those beings act and receive effects that possess matter, hence even if the vacuum would be taken up by the body there is no necessity that it would divide it nor be divided by it. (Ibid.)[50]

[46] For detailed discussions of Bovillus's natural philosophy, see Cassirer [1927] 2013, 104–113; Margolin 1986.
[47] For a detailed study of Philoponus's theory of prime matter, see Haas 1997; for a discussion of Pico's relation to Philoponus, see Schmitt 1967, 138–159.
[48] "Spatium itaque locus est, ex sese corpore quidem vacuum, sed numquam tamen re ipsa vacuum, sicuti materia aliud est quam forma, nunquam tamen sine forma."
[49] "Etenim longitudo & latitudo non sunt sine corpore, sed sunt in corpore ..." Cf. Philoponus 1888, 557.
[50] "Nam materia est causa cur formae agant, & patiantur ... Neque enim contraria mutuo paterentur si causa efficiens, & patiens non essent in materia, dico scilicet si non essent in materia naturales affectiones, quare si

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According to this line of argument, only if three-dimensional extension is understood as the prime matter that is the subject of forms can the extension of bodies and the active and passive powers of forms explain why bodies are divisible (see De Haas 1997, 117–119).

What these different versions of Neoplatonic matter theory have in common is that they regard matter as a constituent of created beings – either as a constituent that explains the origin of the passive qualities associated with mass or as a constituent that explains the activity of forms and the divisibility of bodies. By contrast, as we have seen in section 2, Taurellus denies that prime matter is a constituent of created beings and holds that immaterial forms have active and passive characteristics of their own. His point is not that matter, due to its lack of determination, is "close to" nothing, nor that matter is undetermined except for its three-dimensional characteristics. Rather, when he calls prime matter "nothing" he has in mind a strict identity statement. This is why it is a suitable metaphor for what is there before the divine act of creation, namely, no created being. Prime matter in this metaphorical sense is absolute non-being.

Evidently, such a conception of prime matter does not lead to a conception of God as a material being that is spatially separated from the created world. In fact, for Taurellus creatures are separated from God in an entirely different sense. As he argues, "since an infinite substance fills out everything, nothing can be separated from it." This is why we differ numerically from God "not with a view to God's being in us and our being in him but in the respect that we differ due to our substance" (*TP*, 412).[51] Here, God is clearly not characterized as a being that possesses limited extension but rather as a being that extends throughout the whole of space. And this means that no creature can be spatially separated from God. Rather, the only sense in which creatures can be understood to be separated from God thus must have to do with the nature of their substance. And to differ from God with respect to substance presupposes that creatures are substances. This is why establishing the sense in which creatures can be understood to be substances is so central for Taurellus's project.

When Taurellus discusses the relation between creatures and God, he considers two different kinds of effects:

trina dimensio ... incorporeum expersque materiae est, neque producet in ipso corpore ingresso & collocato affectionem, neque ab eodem pateretur. Nam ea sola agunt, & econtra patiuntur, quae materiam habent, nihil igitur cogit, & si vacuum reciperetur per corpus, ipsum dividere neque ab ipso dividi."

[51] "Cum vero infinita substantia compleat omnia, nil est a quo separari possit ... Nos a Deo numero non differimus hac ipsa quam hic ponimus ratione, quod & Deus in nobis, & nos in eo simus, tum quod ipsamet nostri substantia differamus." See also the following passage from his *De rerum aeternitate* (1604): "Nothing can emanate outside of God; for because he is infinite and fills out all space, he contains everything in himself. Hence, if it is said that something is outside of God, this cannot be said with respect to local position but with respect to the diversity of substance. Only what completes its essence is in God" (Taurellus 1604, 458: "Extra Deum nihil emanare potest, cum enim sit infinitus, & omne compleat spatium, omnia etiam intra se continet. Proinde si quid extra Deum esse dicatur, locali hoc positu describendum non est, sed substantiae diversitate. Solum id igitur in Deo est, quod eius complet essentiam.")

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> Either they are really separated from the causes, or they have one substance in common with them; the nature of the separate effects is such that, when the causes are removed, they still persist and, vice versa, when they are removed, the causes still persist; but those effects that inhere in the causes cannot be separated from them without perishing entirely because they are not themselves a substance or its parts but only accidents . . . Hence, the world is either . . . really separate from the first cause, such that the substance of both differs, or it is conjoined with it in such a way that if its essence would be sustained it could not persist. (*PT*, 420)[52]

Taurellus is clear that the latter hypothesis would lead to a kind of substance monism according to which the world would be an accident of the divine substance: "If the world is not separated by its substance from God but always exists conjoined with him and in the same way will persist to eternity, it does not subsist in itself . . . But it will be an accident of God that can neither be separated from him nor persist separately" (*PT*, 428).[53] Of course, such a view of the relation between God and the world might seem attractive to some philosophers. Not so to Taurellus. In his view, the world cannot be an accident of the divine substance both due to the nature of God and due to the nature of natural things. As to the nature of God, Taurellus argues that regarding the world as a divine accident has the absurd consequence that one would have to ascribe to God finite accidents: "The absurdity cannot be avoided that an infinite substance will be defined by finite accidents, for the nature of accidents consists in limiting substances or to define them is some other way" (*PT*, 430).[54] In particular, "it would follow . . . that we are the perfection of the substance of God because actions perfect the substance from which they proceed" (*PT*, 492).[55] Taurellus argues that this cannot be right because, due to his infinity, God cannot be said to have accidents at all: "Because God exists infinitely with respect to substance, he does not receive anything through which he could be defined, which is the reason why accidents are as foreign to him as possible since they limit or define substances" (*PT*, 454).[56]

As to the nature of things, Taurellus's view that forms are the only beings that underlie the compositional structure of the world contributes to explicating a sense in

[52] "vel a causis revera separati sunt, vel substantiam cum iis unam habent, separatorum ea est ratio, ut causis sublatis restent nihilominus, aut vice versa illae sublatis hisce supersint, sed qui causis inhaerent, ab iis quidem separari nequeunt, quin penitus intereant, cum non substantia sint ipsa, vel eius partes, sed accidentia solum . . . Mundus ergo . . . vel revera est a prima causa separatus, ut utriusque substantia diversa sit, vel ei sic est coniunctus, ut nisi eius essentia sustineatur, consistere nequeat . . . "

[53] "si substantia mundus a Deo separatus non sit, sed coniunctus ab eo semper ut nunc extiterit, sicque sit in aeternum perduraturus, per se nequaquam subsistet . . . sed accidens eius erit, quod ab eo separari, vel separatim consistere non possit . . . "

[54] "absurdum evitare non poterit, infinitam nimirum substantiam aliquibus definiri accidentibus, eorum siquidem natura sit substantias vel circumscribere, vel alio quovis definire modo."

[55] "Hinc enim quod absurdissimum et impium fuerit, nos substantiae Dei perfectionem esse consequeretur, actiones siquidem substantiam qua prodeunt perficiant . . . "

[56] "Infinitus substantia Deus existens, suscipit nihil quo possit ipse definiri, quae causa est ut accidentia sint ab eo quam alienissima, quod substantias vel circunscribant, vel alias definiant."

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which the world differs by its substance from God. In the preface to the second treatise of *Triumphus Philosophiae* Taurellus points out that there is a close connection between his criticism of the theory of prime matter and his theological aim of defending the doctrine of creation. This connection has to do with a consequence that, in his view, follows from the theory of prime matter, namely, that prime matter is an accidental being. As he remarks, the Aristotelian principles "want matter which is nothing by itself to be something accidentally. For if this is true, it will be an accident, not a substance" (*PT*, 240).[57] As Taurellus argues, something analogous holds for the conception of form in the hylemorphistic tradition: "The natural philosophers have stated that natural forms cannot subsist without a subject; if this were admitted, they would not be substances but accidents, because substances are not in something or from something but subsist through their own force, while one says of accidents that they do not subsist but rather are in something" (*PT*, 318).[58] This objection applies in particular to the emergentist conception of substantial forms found in Alexander of Aphrodisias and Schegk. Alexander explicates the relevant sense of substantiality by pointing out that the qualities of the form that emerges from elemental qualities cannot be separated from matter and therefore have to be ascribed to the entire form-matter-composite (Alexander of Aphrodisias [1495] 1559, 72; cf. Alexander of Aphrodisias 2008, 70–72 [*De anima* 5.3–18]). Evidently, such an explication is vulnerable to the objection that it is not clear how a principle that itself depends for its existence on matter could be regarded as something substantial. What is more, Taurellus does not think that a conception of matter and form as accidental beings could be given a consistent formulation. As he argues, a theory of mutual existential dependence between primary matter and form leads to the absurd consequence "that the effect is in this case its own cause. For what gives essence to something else is a cause, a form that cannot subsist without matter is its effect; and conversely because matter is absolutely nothing without form, its subsistence depends on its own effect" (*PT*, 320).[59]

Still, one may wonder why Taurellus did not take the difficulties of the assumption of mutual existential dependence between prime matter and form as an argument for adopting an immaterialist ontology rather than for adopting the medical theory of elements. At this juncture, the limitation of the available source materials is unfortunate because, in *Philosophiae Triumphus*, Taurellus does not discuss the medical conception of elements. As he points out, he has covered this issue in his commentary on Hippocrates's *De natura hominis* (Arnaldus of Villanova 1585, col. 73); but since this commentary is

[57] "materiam quae per se nihil est, per accidens aliquid esse velint: Hoc enim si verum sit, accidens erit non substantia . . . "

[58] "Formas . . . naturales Physici sine subiecto subsistere non posse statuerunt, quod si concederetur non substantiae, sed accidentia forent, illae siquidem per se non in aliquo, vel ab aliquo, sed vi propria subsistant, haec vero non subsistere, sed inesse dicantur."

[59] "axioma possit aliud absurdum inde concludi, effectum videlicet suae ipsius causae causam esse: Cum enim causa sit quod alteri tribuit essentiam, forma sine materia non valens subsistere, huius est effectus, cumque vicissim materia sine forma nil omnino sit, a proprio subsistit effectu."

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no longer extant, we are left with an argumentative lacuna. Nevertheless, when his insistence on the notion of substantiality in *Philosophiae Triumphus* is read in conjunction with a remark about the medical conception of elements from his annotations to Arnaldus of Villanova, it becomes clear why the medical conception of elements is unsuitable for achieving his theological goals. Arnaldus characterizes the medical conception of elements as follows:

> The physician knows that elements are the first principles of the body that can be cured only because the body is affected by the contrary nature of the primary qualities . . . From this is it evident that the physician defines elements, not insofar as they are principles of motion towards a place, but insofar as they are a principle of alteration. (Arnaldus of Villanova 1585, col. 7)[60]

Taurellus comments upon this passage:

> Elements are considered by the physicians insofar as they are principles of alteration, especially of the kind that happens in the human body. This is a motion, not according to substance or place, but according to quality. In order to refute those who believed that there is only a single element of humans, Hippocrates in the first instance derived an argument from pain. When he interpreted the opinion of Hippocrates, Galen reduced it to alteration by saying that what senses pain is necessarily alterable and endowed with sense; and the nature of the body of a being that is in pain must undergo change. (Arnaldus of Villanova 1585, col. 8)[61]

Thus, due to its emphasis on the role of elemental qualities in bringing about qualitative changes in the human body, the medical conception of elements does not offer the theoretical resources for explicating the sense in which elements can be regarded as substances. This is possibly why Taurellus felt the need of going beyond a medical analysis of the nature of elements by understanding elemental qualities as the outcome of the active and passive powers of immaterial forms.

In fact, in his view, a theory of immaterial forms is exactly what yields an analysis of the substantiality of elements. This is so because, once the assumption that form depends existentially on prime matter is given up, there is no need to regard form as an accidental being: "Tell me, does nature subsist by itself or does it subsist in something

[60] "Medicus cognoscit elementa esse prima principia sanabilis corporis, nisi quia contrarietati primarum qualitatum subiicitur . . . Ex his patet, quod Medicus non definit elementa, secundum quod sunt principia motus ad ubi, sed secundum quod sunt alterationis principium . . . "

[61] "[E]lementa . . . a Medicis considerari, quatenus alterationis, & quidem eius, quae fit in humano corpore principia sunt. Haec motus est, non secundum substantiam vel locum, sed qualitatem. Hippocrates eos confutaturus, qui unum existimarunt esse duntaxat hominis elementum, a dolore primum desumit argumentum. Galenus Hippocratis sententiam interpretatus, ad alterationem deducit, statuens id quod dolet alterabile & sensu praeditum esse necessario: siquidem eius quod dolet corporis immutari naturam oportet." See Galenus 1553, 55 (Hippocrates); 32–33, 55–57 (Galenus).

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other? If you say that nothing underlies it, why shouldn't one be allowed to ascribe the same to form, such that it is nature and subsists without matter?" (*PT*, 376).[62] Taurellus's immaterialism about the basic constituents of the compositional structure of reality thus explicates a sense in which these basic constituents are substances. This is crucial for Taurellus's characterization of the relation between God and the world: "Because the world is separated from God by its substance, it is not conjoined with him from eternity" (*PT*, 426).[63] The ensuing view of the relation between God and creatures accepts creation dependence of creatures on God but denies the dependence of creatures' continued subsistence on God. Consider the following characterization of physical change: "Nothing happens accidentally if not something that is in itself is presupposed. The natural philosophers propose this as an axiom, that something active does not have any effect unless the subject on which this action is directed possesses the disposition to receive this activity" (*PT*, 266–268).[64] Thus, what natural things, in Taurellus's view, possess are active potencies that bring forth changes in other natural things and passive potencies that make them capable of undergoing changes through the agency of other natural things. These natural changes are determined by natural active and passive potencies of immaterial forms, but these natural potencies cannot bring about any kind of change for which immaterial forms do not have a disposition. This is why these changes do not carry with them any threat to the subsistence of the world: "Because the world is substance and because one says that something is changed naturally when it is changed in a direction for which it has some disposition in it, it follows that if the world does not decay in this way, it does not carry any potency [for decay] in itself" (*PT*, 498).[65] In this sense, the existence of natural things is due to a divine act of creation but the subsistence of these natural things does not require any continuous divine concurrence: "Things . . . have received substance from him, but they do not continue to receive it" (*PT*, 492).[66] This is the crucial point that Taurellus's rejection of prime matter is meant to make. Only if the subsistence of the forms that underlie the compositional structure of the world as well as their active and passive potencies do not depend on continued divine agency can the hypothesis that the world is an eternal accident of the divine substance be refuted. And in this way, an immaterialist conception of the ultimate constituents of reality contributes to an

[62] "dic quaeso an per se natura vel in aliquo subsistat, quod si nihil ei subesse dixeris, cur non idem formae liceret adscribere, ut et natura sit ipsa, et per se sine materia subsistat."
[63] "Cum . . . mundus a Deo substantia separatus sit, ab aeterno ipsi nequaquam coniunctus fuit . . . "
[64] "per accidens nihil fit, nisi aliquid per se praesupponatur, quod ipsimet Physici certo velut axiomate proponunt, nihil videlicet efficere quod agit, nisi subiectum quod patitur habilitatem habeat ut eam actionem suscipere possit . . . "
[65] "Quamobrem cum natura mundi sit substantia, eaque naturaliter transmutari dicantur, quae in id ad quod habilitatem in se quandam habent, mutantur, mundum si non hac ratione corrumpatur, potentiam in se nullam habere consequitur."
[66] "Res . . . substantiam ab eo quidem accepisse, non accipere dicenda sint."

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indirect defence of the theological doctrine of creation *ex nihilo* by refuting the rival doctrine of the eternity of the world.

4. Conclusion

True to his reputation, Taurellus rejects some assumptions that his contemporaries took to be central to Aristotelian natural philosophy. However, his criticism of the theory of prime matter did not lead him to accept a theory of material atoms, nor did it lead him to restrict himself to an analysis of elements as bearers of primary qualities responsible for alterations in the human body relevant for diseases and their cures. Rather, Taurellus holds that immaterial forms alone are the bearers of the active and passive qualities from which all of the forces observable in the natural world emerge. Moreover, he reinterprets elements as a basic kind of forms – the forms that serve as subjects of other forms and in this sense are the "matter" of other forms. In addition to the difficulties inherent in the theory of prime matter that Taurellus has identified, his rejection of prime matter is an integral part of his project of developing a unified account of philosophical and theological truth. This becomes clear in the theological motivation that he develops for the rejection of the theory of prime matter. As he argues, the doctrine of prime matter implies that both prime matter and forms are accidents rather than substances. This challenges the doctrine of creation *ex nihilo* because, if matter and forms are understood as accidents, there is no cogent way of excluding the view that they are accidents of the divine substance. And in this case, there is no cogent way of excluding the view that matter and form eternally emanate from the divine substance. By contrast, Taurellus's account of form is meant to explicate a sense in which forms are genuine substances: If there is no prime matter, forms do not inhere in matter and therefore are not accidents but substances. Moreover, understanding immaterial forms as substances with determinate active and passive potencies makes their continued subsistence and activity independent from divine agency. In Taurellus's view, it is the substantiality of immaterial forms that establishes that the difference between God and natural beings is a difference of substance. And only if forms are substantial beings that possess active and passive potencies of their own can the hypothesis that the world is an eternal accident of the divine substance be excluded.[67]

Let me close with some tentative remarks about how my interpretation of Taurellus's conception of forms as elements fits into the framework of recent interpretations of the nature of Lutheran natural philosophy in the sixteenth century. Of course, the problem of how to characterize Lutheran natural philosophy in general terms has occupied historians of science for some decades, and it seems fair to say that – due to the heterogeneous nature of the available source materials – no strongly unified picture has

[67] The question of emanative causation remained a central concern of Taurellus's thought. For a detailed discussion of the objections to an emanation theory of creation in his later writings, see Blank 2009.

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emerged. Some scholars have tried to locate the essence of Lutheran natural philosophy in a renewed interest in the results of anatomical research and astronomical observation (see Nutton 1993; Cunningham 2001; Kusukawa 1995, 16–26). According to such a line of interpretation, there is a substantial analogy between the Lutheran interest in the literal meaning of Scripture and the interest in reading "the book of nature" (see Harrison 1998). Such a renewed interest in observation also explains why Lutheran anatomists and astronomers were inclined to deviate from the Aristotelian tradition. Other scholars have emphasized the persistence of elements of Aristotelian logic, metaphysics, psychology and natural philosophy in Lutheran thought. According to such a line of interpretation, the a priori aspects of Lutheran natural philosophy did not lead so much to conceptual innovation but rather to innovative applications of traditional lore in educational contexts (see Petersen 1921; Leinsle 1985; Frank 2003, 102–104; Methuen 2008). Taurellus's work cannot be subsumed easily under either of these interpretive strategies. As Sachiko Kusukawa has pointed out, as far as matters of methodology go, Taurellus takes up Melanchthon's conception of three criteria of certainty – innate ideas, syllogistic demonstration, and experience (see *PT*, 208–212; 506–508; Kusukawa 1995, 204).[68] Also, she notes that Taurellus agrees with Schegk's defence of the difference between demonstrative and topical reasoning (see Schegk 1570; Kusukawa 1995, 204).[69] At the same time, as I have argued in this article, Taurellus uses arguments based on an a priori analysis of concepts such as prime matter, element, and form to develop a conception of the ultimate constituents of the corporeal world that profoundly differs from a hylemorphistic account of elements and also gives an entirely novel sense to the medical view that elements are the ultimate, not further analysable constituents of reality. In Taurellus's case, a novel conception of the nature of the ultimate constituents of reality did not spring from anything like a renewed interest in observation or experience but rather from a priori reasoning. It is such a combination of a priori reasoning and conceptual innovation that makes his account of forms as elements distinctive within the context of sixteenth-century Lutheran natural philosophy.

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[68] For a discussion of Melanchthon's methodological views, see Kusukawa 1997.
[69] For a discussion of Schegk's methodological views, see Kusukawa 1999.

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