

Tschirnhaus's Proposal to Spinoza and Leibniz's *De Summa Rerum*: On the Origin of Finite Things from God's Attributes

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Ehrenfried Walther von Tschirnhaus (1651-1708) has been noted as a key figure of the philosophical intercourses in 17th century, as well as a renowned mathematician and natural scientist. He was one of the first people who got a copy of the *Ethics* from Spinoza. As his letters to Spinoza demonstrate, he precisely understood Spinoza's metaphysics. Moreover, Leibniz knew Spinoza's doctrines from Tschirnhaus. Leibniz's *De Summa Rerum* of 1675-76 can be regarded as a product of his first serious reaction to the Spinozistic philosophy, and it is undoubtedly a benchmark of the developmental history of Leibniz's metaphysics. In this paper, I first introduce how Tschirnhaus encountered Spinoza and Leibniz, taking note of his biographical information. I then compare metaphysical discussions in Tschirnhaus's letters to Spinoza and Leibniz's *De Summa Rerum*, with an aim to figure out their common features and the difference between them.

1. Tschirnhaus's Relationship with Spinoza and Leibniz

Tschirnhaus was from a noble family of Saxony.¹ He arrived at Leiden when he was 17 years old, and intensively studied mathematics and philosophy at University of Leiden.² He came to Paris for further mathematical inquiries at the end of August 1675. He had a recommendation from Henry Oldenburg, and soon got an acquaintance with Leibniz. Although Tschirnhaus and Leibniz respected each other's talent,³ Tschirnhaus did not strongly support Leibniz's project of the infinitesimal analysis, since Tschirnhaus was remarkably influenced by Descartes, and he was not willing to introduce a sign to represent a mathematical object which we do not intuitively conceive.

As for Spinoza, Tschirnhaus met him by January 1675.⁴ Tschirnhaus then sent a letter to him, and impressed him with a good understanding of philosophy. In fall of 1675, the Amsterdam physicist Georg Hermann Schuller⁵ told Spinoza that Tschirnhaus had met Leibniz and wanted to show him a copy of the *Ethics*.⁶ Many scholars note that Spinoza was reluctant to show it to Leibniz, and it is unlikely that Tschirnhaus actually showed his copy to

1 Antognazza 2009, p. 161.

2 Antognazza, *ibid.*; Israel 2001, p. 637.

3 One of Tschirnhaus's remarkable contributions to mathematics is a discovery on "the determination of tangents and of quadratures." See Antognazza *ibid.*, p. 164.

4 Antognazza *ibid.*, p. 168.

5 Matthew Stewart wrote that Schuller at first saw Tschirnhaus at the University of Leiden, when both of them were students. See Stewart 2006, p. 126.

6 Nadler 2008, p. 224.

Leibniz.⁷ But Tschirnhaus could talk about the content of the book to Leibniz, and shortly after that Leibniz wrote a note on Spinoza's metaphysics.⁸

Although Spinoza passed away in 1677, he had a massive impact upon Tschirnhaus's matured philosophy.⁹ Following Spinoza, he emphasized that anatomical investigations of a human body reveal our important psychological features. He also continued exchanges with Leibniz.¹⁰ However, I do not follow details of their correspondence. Instead, I focus upon Tschirnhaus's correspondence with Spinoza in the next chapter.

2. Tschirnhaus's Proposal to Spinoza

The correspondence between Spinoza and Tschirnhaus started on 8 October 1674. In the following, I introduce all the letters from Tschirnhaus for understanding the context of his proposal to solve problems of Spinoza's metaphysics.

2.1 The First Letter

The first letter is mainly about an epistemological problem concerning the philosophy of Descartes (Geb. IV.262-4 = SM.906-8). Tschirnhaus was interested in methods and rules for philosophical inquiries. From his youth, he greatly respected Descartes, and was influenced by the Cartesian method and rules of investigation.

Tschirnhaus was also interested in whether a human being is free. He suggested that some external cause may compel him to do something. In this case, *pace* Descartes, we may not have a freewill. Yet he was not sure that such an external cause actually compelled him to do something. Here it is not easy to figure out his view on the human freedom.¹¹ As well known, Spinoza had a clear and controversial view on the topic: he emphasized that it is

7 See Klever 1996, p. 46; Nadler *ibid.*, p. 225. Indeed, according to Georges Friedmann, Leibniz did not know the texts of the *Ethics* when he visited Spinoza in Haag in November 1676. (Friedmann 1962, p. 83; Nadler 1999, p. 387).

Mogens Laerke recently proposes a hypothesis that Tschirnhaus introduced contents of Spinoza's *Short Treatise on God, Man, and his Well-being* (not a copy of the *Ethics*) to Leibniz, given that the discussions in Leibniz's note of early 1676 fairly fit with the contents of the *Short Treatise* (Laerke 2011).

8 See Klever 1996, pp. 46-47.

9 The following passage, for example, shows a remarkable influence from Spinoza. "By physics I understand nothing else than the science of the universe demonstrated a priori by the rigorous method of the mathematicians and confirmed a posteriori by the most evident experiences which even convince the imagination. [...] This science is truly divine. [...] Since when we bring the study of all the general items of this science to a good end, then not only the knowledge of our mind and its eternity, but also of God himself [...] becomes clear and evident for us." (Tschirnhaus 1686; Klever 1996, p. 52)

According to Jonathan Israel, since Christian Thomasius noted a strong influence from Spinoza upon Tschirnhaus's work, he explicitly denounced it as a book of disguised Spinozism (Israel 2001, p. 640).

10 For instance, Leibniz emphasized the importance of his binary number system to Tschirnhaus in 1682. Leibniz also noted that Malebranche did not have a robust method of analysis and to this extent he was inferior to his rival Arnauld. Leibniz once had a bad relationship with Tschirnhaus, but he later asked him for a help when he attempted to establish the scientific academy of Dresden.

11 According to Steven Nadler, Tschirnhaus wanted to suggest that "human freedom does not require the absence of all determination" (Nadler 1999, p. 328), and that even if we are partially determined by external causes, we can be free. Jonathan Israel also introduces Tschirnhaus's complex attitude concerning human freedom, inspired by Johannes Verwey's study on Tschirnhaus (Israel 2001, p. 639; Verwey 1905).

impossible that a human being is free from external cause, and freedom is nothing but an illusion. But Tschirnhaus did not explicate his position here.

2.2 The Second Letter

Tschirnhaus mentioned to Spinoza's *Ethics* in the second letter on 5 January 1675:

“[S]ince extension when conceived through itself is indivisible, immutable, etc., how can we deduce a priori the many and various forms that it can assume, and consequently the existence of figure in the particles of a body, which yet are various in any body and are different from the figures of the parts which constitute the form of another body?”¹² (Geb.IV.268 = SM.911)

Here Tschirnhaus asked a question concerning how two bodies are differentiated. According to him, extension is indivisible and simple, and the extension of one thing does not differ from that of another. Both Body A and Body B have extension, and to this extent they are not different. Thus generally speaking, extension alone cannot provide the difference between these two things. It seems that something in addition to extension is required to produce two different bodies, and Tschirnhaus wanted to know what it is.

2.3 The Third Letter

The third letter, dated 12 August 1675, includes not only Tschirnhaus's new question to Spinoza, but a presentation of his own view. He started the letter with the following question:

“Will you please let me have a proof of your assertion that the soul can not perceive any more attributes of God than extension and thought. Although I can understand this quite clearly, yet I think that the contrary can be deduced from the Scholium to Prop. 7, Part II of the *Ethics*, perhaps only because I do not sufficiently perceive the correct meaning of this Scholium. I have therefore resolved to explain how I come to this conclusion, earnestly begging you, esteemed Sir, to come to my aid with your customary courtesy wherever I do not rightly follow your meaning.”¹³ (Geb.IV.279 = SM.920)

Tschirnhaus suggested that although Spinoza denied that the human soul can perceive attributes other than

12 “[C]ùm extensio, quatenus per se concipitur, indivisibilis, immutabilis, &c. sit, à priori deducere possimus tot, tamque multas oriri posse varietates, & per consequens existentiam figurae in particulis alicujus corporis, quae tamen in quovis corpore variae, & diversae sunt à figuris partium, quae alterius corporis formam constituunt?”

13 “Abs te peto Demonstrationem ejus, quod dicis; nempe quòd anima non possit plura attributa Dei, quàm Extensionem, & Cogitationem percipere. Quod quidem licet evidenter videam, contrarium tamen ex Schol Prop. 7. part. 2. Ethices posse deduci, mihi videtur, fortè non aliam ob causam, quàm quia sensum hujus Scholii non satis rectè percipio. Constitui ergo, haec quâ ratione deducam, exponere, te, Vir Cl. obnixè rogans, ut mihi velis, ubicunque sensum tuum non rectè assequor, solitâ tuâ humanitate succurrere.”

extension and thought, the framework of the *Ethics* does not undermine the possibility of perceiving other attributes. His suggestion is based upon the following passage of the *Ethics*, namely the Scholium to Prop. 7 Part II:

“At this point, before proceeding further, we should recall to mind what I have demonstrated above – that whatever can be perceived by infinite intellect as constituting the essence of substance pertains entirely to the one sole substance. Consequently, thinking substance and extended substance are one and the same substance, comprehended now under this attribute, now under that. So, too a mode of Extension and the idea of that mode are one and the same thing, expressed in two ways. This truth seems to have been glimpsed by some of the Hebrews, who hold that God, God’s intellect, and the things understood by God are one and the same. For example, a circle existing in Nature and the idea of the existing circle – which is also in God – are one and the same thing, explicated through different attributes.

And so, whether we conceive Nature under the attribute of Extension or under the attribute of Thought or under any other attribute, we find one and the same order, or one and the same connection of causes – that is, the same things following one another.”¹⁴ (Geb.II.110 = *Ethics*. 2P7S = SM.247)

Tschirnhaus suggested that the scholium implies that the soul can perceive an attribute of God other than extension and thought. Perhaps he thought that an attribute understood by God’s infinite intellect can also be understood by the human intellect, while Spinoza thought that unlike God’s intellect, the human soul is finite and there are many attributes that are unconceivable for it.¹⁵ At any case, Tschirnhaus presented his own view in the latter part of the letter:

“My position is as follows. Although I do indeed gather from your text that the world is one, it is also no less clear therefrom that the world is expressed in infinite modes, and that therefore each single thing is expressed in infinite modes. Hence it seems to follow that, although the particular modification which constitutes my mind and the particular modification which expresses my body are one and the same modification, this is expressed in infinite modes – in one mode through thought, in another through extension, in a third through some attribute of God unknown to me, and so on to infinity. For there are infinite attributes of God, and the

14 “Hic, antequam ulterius pergamus, revocandum nobis in memoriam est id, quod supra ostendimus; nempe, quod quicquid ab infinito intellectu percipi potest, tanquam substantiae essentiam constituens, id omne ad unicam tantum substantiam pertinet, et consequenter quod substantia cogitans et substantia extensa una eademque est substantia, quae jam sub hoc, jam sub illo attributo comprehenditur. Sic etiam modus Extensionis et idea illius modi una eademque est res, sed duobus modis expressa; quod quidam Hebraeorum quasi per nebulam vidisse videntur, qui scilicet statuunt Deum, Dei intellectum resque ab ipso intellectas unum et idem esse. Ex. gr. circulus in natura existens et idea circuli existentis, quae etiam in Deo est, una eademque est res, quae per diversa attributa explicatur; et ideo sive naturam sub attributo Extensionis, sive sub attributo Cogitationis, sive sub alio quocunque concipiamus, unum eundemque ordinem sive unam eandemque causarum connexionem, hoc est, easdem res invicem sequi reperiemus.”

15 Cf. Donagan 1996, pp. 351-353.

order and connection of their modifications seems to be the same in all cases. Hence there now arises the question as to why the mind, which represents a particular modification – which same modification is expressed not only by extension but by infinite other modes – why, I ask, does the mind perceive only the particular modification expressed through extension, that is, the human body, and not any other expression through other attributes?"¹⁶ (Geb.IV.279 = SM.920)

Here Tschirnhaus suggested that the human soul is identical to some mode of an attribute that is different from extension and thought. According to Spinoza, the human soul and its body are "one and the same" (Ethics 2P7C; 3P2S).¹⁷ If so, for Tschirnhaus, it seems that generally speaking a mode of one attribute is identical to a mode of another attribute, and the human soul should be identical to a mode of some unknown attribute. In fact, Spinoza did not deny that there is a mode of an unknown attribute that is considered as one and the same with the human body. For him, even if we do not have an epistemic access to other attributes, we are certain modes of these attributes as well.

2.4 The Fourth Letter

The fourth letter of 2 May 1676 is short, which starts as the following:

"First, I find it very difficult to understand how the existence of bodies having motion and figure can be demonstrated a priori, since there is nothing of this kind to be found in Extension, taken in the absolute sense."¹⁸ (Geb.IV.331 = SM.955)

Here Tschirnhaus came back to his question in the second letter. He again noted that we cannot find any reason to specify finite things that constitute the universe of extended things. Unlike the second, the fourth letter includes a discussion of motion. Following Descartes, Spinoza argued that a body is individuated through its motion (AT. VIIIA.52-3 = Pr.II.23 = CSM.1.232).¹⁹ Parts of a body belong to that body since they share a common motion. Thus

16 "Ea autem sic sese habent. Quòd, licet inde colligam, mundum utique unicum esse, id tamen exinde non minùs quoque clarum est, eum ipsum infinitis modis expressum; ac proinde unamquamque rem singularem infinitis modis expressam esse. Unde videtur sequi, quòd Modificatio illa, quae Mentem meam constituit; ac Modificatio illa, quae Corpus meum exprimit, licet una, & eadem sit Modificatio, ea tamen infinitis modis sit expressa, uno modo per Cogitationem, altero per Extensionem, tertio per attributum Dei mihi incognitum, atque sic porrò in infinitum, quia infinita dantur Attribute Dei, & Ordo, & Connexio Modificationum videtur esse eadem in omnibus. Hinc jam Quaestio oritur, quare Mens, quae certam Modificationem repraesentat, & quae eadem Modificatio non solùm Extensione, sed infinitis aliis modis est expressa; quare, inquam, tantùm Modificationem illam per Extensionem expressam, hoc est, Corpus humanum, & nullam aliam expressionem per alia attributa percipiat."

17 Also see Della Rocca 1993, 1996.

18 "Primò difficulter admodùm concipere queo, quì à priori corporum existentia demonstretur, quae motùs, & figuras habent; cùm in Extensione, absolutè rem considerando, nil tale occurrat."

19 Michael Della Rocca argues that "Spinoza's debt to Cartesian mechanism is apparent," since Descartes thought "all variety in the extended world could be accounted for simply by differences in the degree of motion and rest of parts of matter," and

motion is essential for the individuation of a body. But Tschirnhaus did not think Spinoza's explanation as satisfactory, since he could not find a reason why a particular body has some motion rather than others.

2.5 The Fifth Letter

In the fifth letter of 15 July 1676, Tschirnhaus himself tried to explain the variety of things utilizing Spinoza's framework:

“However, my particular reasons for making this request are as follows. In mathematics I have always observed that from any thing considered in itself – that is, from the definition of any thing – we are able to deduce at least one property; but if we wish to deduce more properties, we have to relate the thing defined to other things. It is only then, from the combination of the definitions of these things, that new properties emerge. For example, if I consider the circumference of a circle in isolation, I can infer nothing other than that it is everywhere alike or uniform, in respect of which property it differs essentially from all other curves; nor shall I ever be able to deduce any other properties. But if I relate it to other things, such as the radii drawn from the centre, or two intersecting chords, or many other things, I shall in some way be able to deduce more properties.”²⁰ (Geb.IV.332-4 = SM.957)

In the passage, Tschirnhaus suggested that many properties may be brought about by combining many items. “The circumference of a circle” is analogical to the attribute of extension, since Tschirnhaus wrote “I fail to see how from an Attribute considered only by itself, for example, Extension, an infinite variety of bodies can arise” (SM.957). And I take “the radius” as analogical to another attribute. Just like that a circumference has a relational property with respect to the radius, the attribute of extension has a certain relational property with respect to another attribute. To sum up, Tschirnhaus did not propose a sufficient explanation of how a particular body is produced. He just tried to introduce an idea of how the attribute of extension comes to have different properties by being related to other items.

3. Leibniz's Metaphysics in *De Summa Rerum*

Rightly after knowing Spinoza's doctrines from Tschirnhaus, Leibniz wrote a note on Spinoza's

Spinoza completely accepted this view (Della Rocca 2008, p. 72). Although Spinoza gave a critical note on Descartes' principles of natural things (SM.956; Gabbey 1996, p. 188), we find a decisive impact upon Spinoza from the Cartesian philosophy.

20 “Rationes tamen, cur illud specialiter desiderem, hae sunt, quòd in Mathematicis semper observarim, quòd nos ex quavis re in se consideratà, hoc est, ex definitione cujusque rei, unicam saltem proprietatem deducere valeamus; quòd si autem plures proprietates desideremus, necesse esse, ut rem definitam ad alia referamus: tunc siquidem ex conjunctione definitionum harum rerum novae proprietates resultant. Ex. gr. Si circuli peripheriam considerem solam, nihil aliud concludere potero, quàm quòd ubique sibi similis, sive uniformis existat, quâ quidem proprietate ab omnibus aliis curvis essentialiter differt, nec ullas alias unquam potero deducere. Verùm si ad alia referam, nimirum ad radios ex centro deductos, ad duas lineas sese intersecantes, aut plures quoque, plures utique hinc proprietates deducere valebo[...].”

metaphysics.²¹ Leibniz then started to write a collection of articles. He did not intend to write a single and long work. Rather, he seems to have tried to describe what passed by his mind concerning metaphysics. But these articles were collected, and edited with the title *De Summa Rerum* (hereinafter DSR) in the Academy Edition.²² At least they were edited as one collection with a good reason: the topics in them have something in common, discussing demonstrations of God's existence, God's important features, and the ontological status of human mind and body.

Like Tschirnhaus, Leibniz tried to explain how different things are produced through the attributes of God. Leibniz endorsed some claims of Spinoza: God is the only substance; finite things are modes or modifications, rather than substances; God has an infinite number of attributes; finite things are produced through God's attributes.²³ Here we find a significant influence from Spinoza.

Based upon his monistic metaphysics, Leibniz tried to explain how various finite things come out as modes of God. In *On Simple Forms*, one of the articles of DSR written in April 1676, Leibniz wrote as the following:

“There is the same variety in any kind of world, and this is nothing other than the same essence related in various ways, as if you were to look at the same town from various places; or, if you relate the essence of the number 6 to the number 3, it will be 3×2 or $3 + 3$, but if you relate it to the number 4 it will be $6/4 = 3/2$, or $6 = 4 \times 3/2$.”²⁴ (A.VI.iii.522 = DSR.83)

In this passage, Leibniz explains how “various things” are brought about by the same essence of things, which

21 The note, supposedly written in February 1676, was translated by Richard Arthur, with the title *On Spinoza's Ethics; and On the Infinite* (A.VI.iii.384-5 = RA.41-3). Although Arthur assumes that the note is about the *Ethics*, as I introduced before, Laerke suggests a hypothesis that Leibniz got information about the content of the Short Treatise from Tschirnhaus, but did not about the *Ethics* (Laerke 2011). This may be true. But at least Leibniz knew from Tschirnhaus that according to Spinoza, “God alone is substance” whereas “all creatures are nothing but modes,” and “there are infinitely many other affirmative attributes besides thought and extension” (A.VI.iii.384-5 = RA.43). Thus when Leibniz discussed these doctrines in DSR, he substantially dealt with some important doctrines in the *Ethics*.

22 Antognazza characterizes DSR as representing “Leibniz's most coherent body of metaphysical texts between the *Confessio Philosophi* of 1671 and the *Discours de Métaphysique* of 1686” (Antognazza 2009, p. 163).

Antognazza also notes that Leibniz's reflections, eventually crystallized as DSR, were “possibly stimulated by his intensive reading of Descartes's *Principia* and by his conversations with Tschirnhaus on Spinoza's philosophy” (Antognazza 2009, p. 172).

23 Robert Adams takes note of *That a Perfect Thing is Possible* from DSR, in which Leibniz asserted “[i]t can easily be demonstrated that all things are distinguished, not as substances (i.e., radically) but as modes” (A.VI.iii.573 = DSR.93). In commenting on this passage, Adams has argued that Leibniz had come to a “monistic conclusion” (Adams 1994, p. 129). By referring to the same passage, Mogens Laerke also suggests that Leibniz held a quasi-Spinozistic system of metaphysics at that time (Laerke 2008, pp. 507-8). Although in a new paper he suggests that Leibniz was not necessarily committed to the claim “all things are one” considering the correspondence between Leibniz and Malebranche, he still argues that Leibniz was probably committed to it. See Laerke 2009.

24 “Varietas eadem in quolibet genere mundi, nec est quicquam aliud, quam eadem essentia diversimode relata, lit si urbem eandem ex diversis focis aspicias, aut si essentiam senarii referas ad ternarium, erit 3×2 vel $3 + 3$, sin ad quaternarium erit $6/4 = 3/2$ seu $6 = 4 \times 3/2$.”

consists in an infinite number of simple forms of God.²⁵ In *On Simple Forms*, Leibniz previously wrote that “there are infinitely various things,” and the “infinite variety can result only from an infinite cause, that is, from various forms” (A.VI.iii.522 = DSR.83). On the basis of this fact, Leibniz argued that “simple forms are infinitely many” (*ibid.*). In another article *On Forms, or the Attributes of God* of DSR, written in April 1676, Leibniz stated that “[a]n attribute of God is any simple form” (A.VI.iii.514 = DSR.69), which implies that any simple form must belong to God as his attribute.²⁶ Leibniz added that “the essence of God consists in the fact that he is the subject of all compatible attributes” (*ibid.*). Thus, Leibniz thinks that God has an infinite number of simple forms or attributes, and all the simple forms taken together are considered as the essence of God. The number 6 in the passage of *On Simple Forms* is a metaphor of God’s essence or all the simple forms taken together, while the number 3 is associated with some of the simple forms or attributes. In *On the Origin of Things From Forms*, supposedly written in April 1676, Leibniz again suggested that 6 is analogous to God’s essence or all of his attributes taken together.²⁷ Thus the passage seems to suggest how various things are produced by introducing some simple forms related to the other forms or all of the forms.

Leibniz also tried to explain how various things are produced through relations of God’s attributes in *On the Origin of Things from Forms*:

“It seems to me that the origin of things from God is of the same kind as the origin of properties from an essence; just as $6 = 1 + 1 + 1 + 1 + 1 + 1$, therefore $6 = 3 + 3, = 3 \times 2, = 4 + 2$, etc. Nor may one doubt that the one expression differs from the other, for in one way we think of the number 3 or the number 2 expressly, and in another way we do not; but it is certain that the number 3 is not thought of by someone who thinks of six units at the same time.”²⁸ (A.VI.iii.518-519 = DSR.77)

Here Leibniz asserted that many distinct properties arise from one essence, which is fairly close to a claim of the passage from *On Simple Forms* that variety is “nothing other than the same essence related in various ways.” This passage also includes a discussion of how attributes are related. The number 3 (as well as the number 2) is a metaphor of some collection of attributes. There are many ways of selecting a collection of attributes, and Leibniz

25 Mark Kulstad takes this passage as supporting “the pure relation theory,” according to which finite things are produced by relations of attributes (Kulstad 1999). He differentiates this theory with other theories suggested in DSR. Following Kulstad, Laerke also introduces four distinct theories in DSR concerning the origin of finite things. But both of them admit that theories may be consistent to each other. If so, we can take the passage as representing a system of metaphysics to which Leibniz was committed.

26 In *On Forms, or the Attributes of God*, Leibniz used “form” and “attribute” as synonyms, as we can guess from the very title. For instance, he wrote that “[i]t is a wonderful fact that a subject is different from forms or attributes” (A.VI.iii.514 = DSR.69).

27 Leibniz also suggested that 6 is essentially $1 + 1 + 1 + 1 + 1 + 1$, but it can be considered as $3 + 3, 3 \times 2$, and $4 + 2$ (A.VI.iii.518 = DSR.77). As he did in *On Simple Forms*, Leibniz suggested that the same essence is considered in many different ways.

28 “Mihi videtur origo rerum ex Deo talis esse, qualis origo proprietatum ex essentia, ut senarius est $1 + 1 + 1 + 1 + 1 + 1$. Ergo $6 = 3 + 3, = 3 \times 2, = 4 + 2$, etc. Nec dubitandum est unam expressionem ab alia differre, nam uno modo ternarium expresse cogitamus, aut binarium, alio non idem, certum est autem ternarium ab eo non cogitari, qui sex Unitates simul cogitate[...].”

seems to suggest that different properties are brought about in accordance with a way of selecting a collection of attributes that are related to the others.

4. Concluding Remark

Leibniz's theory in DSR has something in common with what Tschirnhaus proposed to Spinoza. In his second letter to Spinoza of 5 January 1675, Tschirnhaus asked how the particular bodies come to exist given that "extension when conceived through itself is indivisible" (SM.911).²⁹ Since Spinoza did not provide a satisfactory answer for this question, he offered an explanation for how different properties are given in the framework of the *Ethics*, arguing that "new properties emerge" if we relate one thing to others (Geb.IV.334 = SM.957). For instance, the circumference of a circle has many properties when it is related to its radius and others. Hereby he suggested that many properties of particular bodies are given when the attribute of extension is related to other attributes. As Tschirnhaus did, Leibniz deviated from Spinoza's view. Spinoza did not attempt to explain the variation of finite things on the basis of relationships among attributes. And both Tschirnhaus and Leibniz did not clearly explicate how God's intellect relates many attributes and produce finite things.

Although Tschirnhaus's proposal is similar to Leibniz's discussion in DSR, they are not exactly the same. Leibniz suggested that properties are given when some attributes are related to the others. Here all the attributes are involved, while according to Tschirnhaus, a property is given when an attribute is related to another attribute. By involving all the attributes or God's essence, Leibniz suggested that finite things do not substantially differ from God. In contrast, Tschirnhaus tried to explain the actual variety of things without emphasizing his commitment to the monistic metaphysics.

Abbreviations of Primary Texts and Translations

- A: *Sämtliche Schriften und Briefe*. Herausgegeben von der Deutschen Akademie der Wissenschaften zu Berlin. Darmstadt, 1923 ff., Leipzig, 1938 ff., Berlin, 1950 ff. Cited by series, volume, and page.
- AT: *Oeuvres de Descartes*. Edited by Adam and P. Tannery. Paris: L. Cerf, 1897-1913. Cited by volume and page.
- CSM: *The Philosophical Writings of Descartes*. Translated and edited by John Cottingham, Robert Stoothoff, and Dugald Murdoch, 1984-91. Cambridge: Cambridge University Press.
- Ethics: *Ethica*. Cited by book and axiom (A), definition (D), or proposition (P).
- Geb: *Baruch de Spinoza Opera*. Ed. Carl Gebhardt. Heidelberg: Carl Winters, 1925. Cited by volume and page.
- DSR: *De Summa Rerum*. Translated and edited by G.H.R. Parkinson, 1992. New Haven: Yale University Press.
- Pr: *Principia Philosophiae*. Cited by part and proposition.
- RA: *G.W. Leibniz The Labyrinth of the Continuum*. Translated and edited by Richard T.W. Arthur, 2001. New Haven: Yale University Press.
- SM: *Spinoza Complete Works*. Translated by Samuel Shirley, Edited by Michael L. Morgan, 2002. Indianapolis: Hackett Publishing Company.

²⁹ Tschirnhaus also asked how the motion of a body is brought about in this letter. This question is quite related to how a particular body is given if its figure is only given by motions.

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