

///// studie / article //////////////////////////////////////

**HENRY MORE'S "SPIRIT OF NATURE" AND NEWTON'S AETHER**

**Abstract:** *The paper presents the notion of "Spirit of Nature" in Henry More and describes its position within More's philosophical system. Through a thorough analysis, it tries to show in what respects it can be considered a scientific object (especially taking into account the goals of More's natural philosophy) and in what respects it cannot. In the second part of this paper, More's "Spirit of Nature" is compared to Newton's various attempts at presenting a metaphysical cause of the force of gravity, using the similarities between the two to see this notorious problem of Newton scholarship in a new light. One thus sees that if Newton drew from Stoic and Neo-Platonic theories of aether or soul of the world, we need to fully acknowledge the fact that these substances were traditionally of a non-dualistic, half-corporeal, half-spiritual nature. Both More's "Spirit of Nature" and Newton's aether can thus be understood as different attempts at incorporating such a pneumatic theory into the framework of modern physics, as it was then being formed.*

**Keywords:** *Henry More; Isaac Newton; Spirit of Nature; aether; pneuma; gravitation*

**JACQUES JOSEPH**

Department of Philosophy and History of Science  
 Faculty of Science, Charles University  
 Viničná 7, 128 00 Praha 2  
 email / LePabouk@gmail.com

**Morův Spirit of Nature a Newtonův éter**

**Abstrakt:** *Příspěvek představuje pojem Spirit of Nature u Henryho Mora a jeho pozici v rámci Morova filosofického systému. Důkladnou analýzou se pokouší ukázat, v jakých ohledech je možné jej (s ohledem na cíle Morovy přírodní filosofie) považovat za vědecký objekt a v jakých nikoli. Následně se pokouší na základě podobností Morova Spirit of Nature s Newtonovými pokusy o metafyzické vysvětlení příčiny gravitační síly nabídnout nový vhled do této v rámci newtonovských bádání zásadní otázky. Ukazuje se totiž, že pokud Newton čerpal ze stoických a novoplatónských teorií éteru a světové duše, je třeba vzít v potaz silně nedualistické, tělesně-duchovní pojetí těchto substancí. Spirit of Nature i Newtonův éter by tak bylo možné chápat pouze jako různé pokusy, jak takovéto tradiční pojetí pneumatu začlenit do rodící se moderní fyziky.*

**Klíčová slova:** *Henry More; Isaac Newton; Spirit of Nature; éter; pneuma; gravitace*

## Introduction

The main topic of my paper is going to be the “Spirit of Nature”, a spiritual substance that, according to 17<sup>th</sup> century Cambridge Platonist Henry More, pervades the whole of the universe and moves inert matter in such a way as to bring about all sorts of phenomena that cannot be explained by purely mechanical laws. This topic may feel a bit out of place, since such a thing doesn’t really look like a scientific object. That’s why I am first going to present a general description of More’s metaphysical system and of the place of the “Spirit of Nature” in it, arguing that if we take into account the preoccupations of More and the interconnectedness of metaphysics and physics in that period, there definitely are respects in which the “Spirit of Nature” can be considered as a scientific object.

In my analysis, however, it will also become apparent that the “Spirit of Nature” acts rather as a metaphysical ground for mechanicism than as a direct explanatory principle. This, as I shall argue, is one of the reasons why it didn’t really have a place in the newly-formed physics of Newton and his followers. As such, it is only natural that the “Spirit of Nature” as a scientific object disappeared from scientific discourse before it ever really entered into it. In this sense, it can be put in parallel with Newton’s aether theories and other attempts at providing a cause for gravity. In both cases we are looking at a metaphysical ground of science, the main difference being that while Newton pushes it into the background and focuses on mathematical formulae, for More, the “Spirit of Nature” is supposed to act as a full-fledged explanatory principle. Paradoxically enough, it is Newton’s aether that ultimately became a *bona fide* scientific object and inspired a long tradition of ether theories in modern physics. Although my intention won’t be to strictly claim any form of direct influence of More on Newton, I will try to develop A. R. Hall’s claim that “only if Newton’s metaphysical views are irrelevant to the writing of the *Principia* (and, we might add, of *Opticks* too) is it possible to deny to More any possible influence upon the transformation of the mechanical philosophy effected by Newton in these works.”<sup>1</sup> The parallels I am going to draw between More’s “Spirit of Nature” and Newton’s possible causes of gravity will, I believe, shed some new light on the question of how

This paper was created as part of the project “Renaissance philosophy and science” (GA ČR 15-0680S).

<sup>1</sup> Alfred R. HALL, “Henry More and the Scientific Revolution.” In: HUTTON, S. (ed.), *Henry More (1614–1687). Tercentenary Studies*. Dordrecht: Kluwer 1990, p. 50 (37–54).

much Newton drew from (and transformed) ancient Stoic and Neo-Platonic theories.

### I. Henry More's "Spirit of Nature"

In Henry More's philosophy, two different traditions of thought intertwine. The first of these is Neo-Platonism, drawing from sources like Plotinus, Proclus or Ficino, while the other is the philosophical tradition of 17<sup>th</sup> century natural philosophy, especially its debates around mechanicism and the related threat of atheism. Although More was one of the first to introduce Descartes's new philosophy to England, his opinion of it wasn't as uncritical as it might have seemed at first. While he sees himself and Descartes as ultimately aiming for the same goal, "the one travailing in the lower Rode of *Democritisme*, amidst the thick dust of Atoms and flying particles of *Matter*, the other tracing it over the high and aiery Hills of *Platonisme*, in that more thin and subtil Region of *Immateriality*,"<sup>2</sup> at the same time, when he sets out to write to Descartes as early as 1648, he finds he cannot agree with him on everything, writing:

But indeed, illustrious Descartes, so as not to conceal anything, although I value very much the most beautiful bulk and essence of your Philosophy, I must however confess there are some minor things that elude me in the second part of the Principles that certainly my spirit is either too dull to understand or too repugnant to accept. Yet your most excellent Philosophy is in no way endangered in the main strokes thereof, since these scruples are such that while they may be judged deservedly to be false or uncertain, they do not reach to anything that is fundamental or essential to your philosophy; and it might very well stand on its own without them.<sup>3</sup>

Later on, when he composes his *Enchiridion Metaphysicum* in 1671, it is with the explicit intention of dismantling Cartesianism, as can be seen from More's correspondence during that time.<sup>4</sup>

<sup>2</sup> Henry MORE, *Collection of Several Philosophical Works*. James Fleisher: London 1662, *Preface*, p. xii (More's emphasis).

<sup>3</sup> More to Descartes, Dec. 11, 1648. In: ADAM, C. – TANNERY, P. (eds.), *Oeuvres de Descartes* V. Paris: Léopold Cerf 1903, p. 238.

<sup>4</sup> Cf. Alexander JACOB, *Henry More's Manual of Metaphysics 1: Chapters 1–10 and 27–28*. Hildesheim: G. Olms Verlag 1995, p. vff.

Despite the appearances, this is not an example of a philosopher doing an ideological U-turn, as has already been pointed out by others.<sup>5</sup> More's first and foremost concern had always been the fight against atheism. Originally, he perceived Cartesianism as a great weapon, showing the full strength and scope of the new mechanistic philosophy, while – more importantly – also showing all its shortcomings, leading to the postulation of immaterial substances, the most perfect of which (and the only necessarily existing) was God. In the end, however, he realized that Descartes gave too much attention to mechanicism and played down the importance of spiritual substances – most of all by not granting them extension (more on that later). What this meant was that although Descartes's intentions were undoubtedly good, his followers, seeing only the mechanical aspects of his philosophy and fascinated by them, fell into full-fledged atheism. The only way to combat this threat, then, was to fully show all the weaknesses of Cartesianism and demonstrate the extent to which spiritual substances are needed to support mechanical philosophy. Simply put, More eventually realized that all those minor scruples he mentioned in his first letter turned out to sway the whole system in a strongly atheistic direction, a thing he could not tolerate, no matter how highly he esteemed Descartes's mechanical genius.

The first step in reasserting the importance of spiritual substances was to grant them extension. For More, extension is a characteristic not just of physical matter but of any substance whatsoever, according to the principle that “there is no real Entity but what is in some sense extended.”<sup>6</sup> While Cartesians thought that spirits are present in space only by virtue of their power, for More, denying any actual spatial extension to them was tantamount to saying they don't exist at all. The problem was that Descartes perceived extension as tied to impenetrability. More thinks that there very well can be extended substances that can share their space with other substances – that is exactly what spirits and souls are! So while More accepts the general traits of Descartes's dualistic view of the world, he draws the dividing line in a quite different way. All substances are extended, even having parts outside parts,<sup>7</sup> with matter being divisible, impenetrable and absolutely passive,

<sup>5</sup> Cf. Alan GABBEY, “Henry More and the Limits of Mechanism.” In: HUTTON, S. (ed.), *Henry More*, pp. 19–36.

<sup>6</sup> MORE, *Collection of Several Philosophical Works, Preface General*, § 12, p. xii.

<sup>7</sup> In the *Enchiridion Metaphysicum*, chap. 27, § 14 (JACOB, *Henry More's Manual of Metaphysics 2: Chapters 11–26*. Hildesheim: G. Olms Verlag 1995, p. 111f.), More claims that the sensitive part of the soul is localized in the head, so that even if we grew an eye on our foot, it wouldn't be able to see, unless connected to the head with some nerves.

while spirits are indivisible, penetrable and the only possible source of activity in the world.<sup>8</sup> This aspect of the passivity of matter as opposed to the activity of spirits is very important, as More is convinced that the interaction of purely passive pieces of matter very often falls short as an explanatory principle. Spiritual substances are needed to account for the behaviour of humans and animals – these all have individual souls – but they are also needed to explain a lot of other phenomena like gravitation, magnetism or thunder, lightning and rainbows. These are all caused by a specific spiritual substance, namely the “Spirit of Nature”.

More defines the “Spirit of Nature” as “A Substance incorporeal, but without Sense and Animadversion, pervading the whole Matter of the Universe, and exercising a Plastical power therein according to the sundry predispositions and occasions in the parts it works upon, raising such Phaenomena in the World, by directing the parts of Matter and their Motion, as cannot be resolved into Mere mechanical powers.”<sup>9</sup> We see that – to use Alan Gabbey’s phrase – the “Spirit of Nature” is basically defined as a “Spirit of causal gaps”, an omnipresent spirit devoid of any free will or thoughts of its own that steps in whenever something happens that could not be caused by purely mechanical interactions.

For example, let’s take gravitation, a very puzzling problem for 17<sup>th</sup> century science. Hobbes’s explanation was that gravitation is caused by tiny particles of ethereal matter moving randomly through space and constantly hitting other bodies thus pushing them down, while for Descartes, these particles were swirling in a vortex around the Earth. These theories had to face a lot of problems. If the particles move in a more or less random fashion, how come they always end up pushing the objects down instead of pushing them in all directions more or less equally, cancelling each other out? How come, also, that the particles cannot be blocked by an especially smooth surface thus changing the angle at which things fall to the ground? If someone shoots a bullet up into the air, how come that the tiny and very light particles of aether still somehow manage to slow down the bullet and pull it back down, despite both its velocity and its density?<sup>10</sup> According to More, these

<sup>8</sup> See e.g. Henry MORE, *The Immortality of the Soul*, book I, chap. 3, § 1, p. 21 (in: MORE, *Collection of Several Philosophical Works*), or Henry MORE, *Divine Dialogues*. Joseph Downing: London 1713, dial. 1, §§ 29–30, p. 61ff.

<sup>9</sup> *The Immortality of the Soul*, book III, chap. 12, § 1 (in: MORE, *Collection of Several Philosophical Works*, p. 193; emphasis omitted).

<sup>10</sup> These common objections are formulated by Henry More e.g. in *The Immortality of the Soul*, book III, chap. 13 (MORE, *Collection of Several Philosophical Works*, p. 196ff.).

are all valid objections. The bullet *should indeed* continue flying straight up into space (More reports this has even sometimes been observed with cannonballs), a sufficiently smooth mirror *should indeed* deflect the aether thus changing the direction of gravitation, and most of all, the random movement of the particles of aether *should indeed* be pushing in all directions equally, so that there wouldn't be any gravitation at all in the first place, *if everything went purely according to mechanical laws*. The fact that things are not like this serves in itself as proof that there are some non-mechanical and therefore immaterial causes at work, namely the "Spirit of Nature" that acts as the vital force unifying the movement of the tiny particles so that things fall down to the ground.<sup>11</sup>

In the *Enchiridion Metaphysicum*, the most notable of More's works in this regard, a lot of other natural phenomena get a similar treatment. The *modus operandi* is the same in all cases, be it with pressure, tides, rainbows, magnetism or thunder and lightning. A mechanical explanation (most usually the Cartesian one) is presented, followed by several objections. After More has shown the necessary insufficiency of the mechanical explanation, he concludes an immaterial cause has to be responsible, this cause being the "Spirit of Nature".

In all these cases, then, it could be argued that the "Spirit of Nature" is presented as a scientific object, something that is brought in to explain a given phenomenon, to integrate it into a scientific framework. Yet at the same time, the "Spirit of Nature" doesn't seem to be doing that much explanatory work. Given the way the "Spirit of Nature" is defined, saying that it is the cause of this or that phenomenon doesn't really say anything more than that the laws of mechanics we have available fail to explain it. To repeat, the "Spirit of Nature" indeed acts as a "Spirit of causal gaps" that just steps in whenever we don't have a more satisfactory explanation.

This problem becomes all the more evident when we consider how we know whether a given phenomenon should be explained through mechanical laws or by the "Spirit of Nature". The best criterion at our disposal seems to be whether the phenomenon behaves regularly or not. From one point of view, this would mean that the "Spirit of Nature" acts according to certain laws and thus brings regularity into a world that would otherwise consist

<sup>11</sup> The fact that some cannonballs have been observed not to fall back to the ground is due to the fact that at a certain distance from the surface of the Earth, the "Spirit of Nature" stops trying to pull the cannonball down and just lets it behave according to mechanical laws (*The Immortality of the Soul*, book III, chap. 13, § 6; MORE, *Collection of Several Philosophical Works*, p. 198f.).

only in bits of matter chaotically flying around and bumping into each other. On the other hand, we would be intuitively inclined to feel that these purely mechanical interactions have some regularity of their own – More himself speaks of mechanical *laws*, after all. Albeit mechanical interactions are not teleologically ordered, anytime two particles hit each other, their respective directions and speeds after the collision are *determined* in a law-like manner. This point of view leads to the opposite of what we have originally stated: it would then seem that the mechanical interactions are what behaves according to a set of laws and the "Spirit of Nature" steps in whenever these laws have to be circumvented. But this would transform the "Spirit of Nature" into some sort of permanent miracle-worker, leading to the question whether a law-like, permanent miracle can still be called a miracle.

More, for one, does not seem to see the "Spirit of Nature" as permanently breaking the laws of nature but rather as *constituting* those laws. This is exactly one of the reasons why he so emphatically insists on the fact that the "Spirit of Nature" has no "Sense or Animadversion". Devoid of any free will, the "Spirit of Nature" does not choose to act in a certain way, it just does. That is why gravitation can sometimes cause a falling object to hurt an innocent person or why the "Spirit of Nature" can sometimes act against its own "interest".<sup>12</sup> But if the opposition between mechanical interactions and the "Spirit of Nature" is the case of one set of law-like regularities opposing another (as I already pointed out, More is talking about "purely mechanical laws" as well), how do we tell into which category a given phenomenon fits? Later, we will see that this dichotomy is for More at least partially a false one but right now, unfortunately, the only answer we seem to have available is a circular one: some phenomena in principle cannot be explained mechanistically. This brings us back to the point I mentioned earlier – the "Spirit of Nature" only acts as a catch-all phrase for whatever we cannot explain otherwise. Or at least for whatever we *think* we cannot explain otherwise, as we can never really be sure whether an as of yet unknown mechanical explanation may not be coming.

Concerning this, More was convinced that Descartes presented pretty much the most accomplished form of mechanistic philosophy possible. That is why, in the *Enchiridion Metaphysicum* as well as in other works, he feels that confuting Descartes (*a fortiori* in what he considers to be the most basic

<sup>12</sup> That would be the case with Boyle's experiments with the vacuum air-pump, more on that below.

mechanical phenomena) amounts to confuting mechanicism in general. In a letter to Hyrne (who came up exactly with this remark), he writes:

As for your two objections, whereof the former is, That though these Mechanicall solutions be false, yet my inference of an incorporeall being from thence is not solid or necessary, because, we are not assured, but other Mechanicall solutions in time may be found that will truly solve these Phaenomena, I answer first, That though this doth not amount to a perfect dry demonstration, such as is in Mathematicks, yet it is an exceeding high probability, scarce any higher in the guidance of y<sup>e</sup> affaires of our life. For it seemes exceeding improbable that so excellent a Wit, the greatest Mathematician in Europe, and of such an eximious Architectonical Genius in Mechanicks as Cartesius, should faile in y<sup>e</sup> solutions of so many & so plain & simple Phaenomena as I have proved he has failed in, if y<sup>e</sup> presence it self of such Mechanicall solutions were not without foundation or a groundlesse presumption.<sup>13</sup>

Thus More really explicitly assumes that if Cartesianism fails, mechanistic philosophy as a whole fails as well and furthermore, that if these fail, the best alternative explanation is his “Spirit of Nature”. But how does the “Spirit of Nature” work as an explanatory concept? What does such an explanation look like? These are quite difficult questions related directly to a change in the perception of science that occurred during the Scientific Revolution. This is of course too vast a subject to cover in one paper so we will have to stick only to some general remarks. These remarks are however crucial in understanding in what respects the “Spirit of Nature” was a scientific object and in what respects it was not.

## II. The “Spirit of Nature” as a Scientific Object

During the Scientific Revolution, during More’s lifetime and later on, there occurred an ideological shift as to what was expected of science. If we are allowed a little simplification, this shift may be designated as a shift from natural philosophy, intrinsically tied to metaphysics, to experimental philosophy and later physics, expanding under Newton’s famous motto, *hypotheses non fingo*. We can get a good idea of this shift if we compare Descartes and Newton. In some regards, Descartes has a very modern project of physics but he founds this project on metaphysical grounds. This leads to a big gap

<sup>13</sup> More to Hyrne, 21 Aug. 1671, quoted in: GABBEY, “Henry More and the Limits of Mechanism,” p. 31.

between the level of phenomenological description (e.g. of light refraction) and the more basic, ontological level where Descartes's mostly speculative models are supposed to explain these phenomena (his theory of rotating light globules). Newton, on the other hand, manages to unify the overall picture (thanks – at least in part – to his introduction of calculus) – but reaches this goal at the cost of downplaying the metaphysical aspect to the point that it ultimately disappears from physics (or at least from its explicit discourse).<sup>14</sup> In this dichotomy, More stands fully on the side of Descartes. Although he is a member of the *Royal Society*, he is not really concerned with experimental results, he even shows open contempt for experimenting which, combined with his criticism of mechanicism, leads to a controversy with the more prominent members of the *Society*.<sup>15</sup> While science was slowly becoming an endeavour to mathematically describe law-like regularities between measurable quantities standing in for various aspects of reality, More was much more interested in the ontological foundations of these relationships and in their metaphysical consequences. That is why, for example, in the chapters on the air-pump experiments and on hydrostatics of his *Enchiridion Metaphysicum*, he does not question the instruments, the techniques or the exactitude of the experimental results but the metaphysical lesson that we should draw from them. This framing of the debate is also the reason why he doesn't feel he needs to provide an explanation as to *how* the "Spirit of Nature" does what it does.<sup>16</sup> Interpreting phenomena and experiments so as to show that they contradict mechanical laws is for him proof enough that some non-mechanical factor is involved and if it is non-mechanical, it must be immaterial (since all matter obeys the laws of mechanics). In the case of phenomena involving non-living matter, this immaterial principle obviously cannot be any individual human or animal soul. Furthermore, it cannot be God either, as that would lead to a crass and blasphemous

<sup>14</sup> For a more detailed analysis, see Ladislav KVASZ, "Galileo, Descartes, and Newton – Founders of the Language of Physics." *Acta physica slovacica*, vol. 62, 2012, no. 6, esp. p. 548ff. and 573ff. (519–614). A more general description of this transformation can be found in Stephen GAUKROGER, *The Emergence of a Scientific Culture: Science and the Shaping of Modernity 1210–1685*. Oxford: Oxford University Press 2006, chap. 8–12.

<sup>15</sup> Cf. HALL, "Henry More and the Scientific Revolution," esp. p. 40f. Also Robert CROCKER, *Henry More 1614–1687. A Biography of the Cambridge Platonist*. Dordrecht: Springer 2013, p. 151ff.

<sup>16</sup> At least not in the same sense as more experimentally oriented philosophers would expect him to do, that is on a level analogical to mechanical explanations. As we will see later, that is because of the fact that More takes the "Spirit of Nature" to be a principally different type of explanation than mechanicism is.

immanentism (and possibly even to pantheism). So the only option left is a different separate spiritual substance about which it can easily be proven that given the circumstances it must be omnipresent and devoid of any intelligence and free will, leading us to the notion of a “Spirit of Nature”, *quod erat demonstrandum*.

Yet such a systematic presentation of the introduction of the “Spirit of Nature” into More’s system does not tell the whole story. The “Spirit of Nature” is a concept that came with a historical baggage that was very important for More. In a tradition going from Platonism and Stoicism, through Plotinus, later Neo-Platonists and Marsilio Ficino up to More, we find very strongly rooted the idea that the whole universe is a living organism and that as such, it has to have a soul. Furthermore, in order to be able to act on its body, this soul – just as any soul – needs an intermediary, a vehicle (*vehiculum, okhema*), usually termed spirit (*spiritus, pneuma*). This spirit is sometimes described in more “spiritual” (in the contemporary sense) terms, sometimes in more material terms, but it is in any way something in between soul and body, allowing for the interaction of the two. According to this doctrine, we all have such spirits, and so does the world.<sup>17</sup>

While these concepts could hardly be considered scientific and while More transformed them quite a bit, we need to be aware of this origin of the concept of “Spirit of Nature” when considering its place. More’s primary motivation is metaphysical (the demonstration of the existence of souls) but it leads him into the domain of natural philosophy and, therefore, of science. Thus More’s neglect of a more detailed study of the way the “Spirit of Nature” works is not a consequence of his using the concept intuitively, for he is not. It is only that the conceptual work done on the “Spirit of Nature” takes place within a different context than that of experimental science. This is confirmed if we consider the two most important occasions where he tells us more about the way the “Spirit of Nature” works.

The first would be a comment on the 13<sup>th</sup> chapter of the *Enchiridion Metaphysicum* treating of the problem of a wooden plate placed in a bucket full of water. According to mechanical laws, the gravity pulling all the water down should hold the wooden plate in place, yet the plate rises to the surface

<sup>17</sup> Such a short summary is hardly exhaustive of the history of these concepts. More details can be found in Gérard VERBEKE, *L'évolution de la doctrine du pneuma du stoïcisme à S. Augustin*. Leuven: Desclée de Brouwer 1945; E. Ruth HARVEY, *The Inward Wits. Psychological Theory in the Middle Ages and the Renaissance*. London: Warburg Institute 1975, or in Dodds's introduction and commentary to his translation of Proclus' *Elements of Theology* (Eric R. DODDS – PROCLUS, *The Elements of Theology*. Oxford: Clarendon Press 1963).

nonetheless. After proving that all possible mechanical explanations fail, More addresses some objections presented by Christoph Sturm and as part of his answer, lays down some laws according to which the "Spirit of Nature" acts:

First, that, although it [i.e. the "Spirit of Nature" – JJ] is one, it permeates all the parts and particles of the matter in the bucket. Next, it not only permeates but vitally activates them. Third, that this Spirit puts forth this vital *energeian* from a certain omniform essential life in itself in the parts or particles of matter, according to given circumstances, in various ways. Fourth, that this omniform life which contains the laws of moving the matter of the world is within individual points as it were – if one may say so – of this Spirit of Nature. Fifth, finally, since this Spirit is a certain essential or substantial life containing the laws of the motions of the matter of the world, and *sympatheia* & *synenergeia* agree with a spirit as such, and finally the said Spirit of Nature is created by the most wise God, from these things it is clear that all its operations, motions, sympathies and synergies are so constituted as, according to certain general rules of the universe, God himself has foreseen that they will be.<sup>18</sup>

According to this and to some later remarks as well,<sup>19</sup> we thus see that the "Spirit of Nature" really acts as a (at least vegetative) soul, making non-living matter alike to a living body, therefore providing a very different sort of explanation than what later experimental philosophers would perceive as scientific.

The second insight into the way the "Spirit of Nature" works is provided collaterally, as part of the debate about action through contact. Besides all the phenomena already mentioned, More points out one more question that mechanicism can't even ask, let alone answer, namely, how does mechanicism itself work? If we take a collision between two particles – the paradigm example of mechanical interaction and the basic explanatory principle of mechanistic philosophy – the fact that a transmission of motion between the two particles occurs should not be taken for granted, thinks More. How is such a thing possible? As most mechanistic philosophers would agree, matter is inert and passive but how exactly are we to understand this passivity? As opposed to the Cartesian conception of passivity as the inability

<sup>18</sup> *Enchiridion Metaphysicum*, Scholia to chap. XIII, sec. 4 (Alexander JACOB, *More's Manual of Metaphysics* 2, p. 75).

<sup>19</sup> E.g. "[the Spirit of Nature], with a corporeal instrument as it were, presses the bottom of the bucket, [...]; the Spirit of Nature, I say, and the watery particles, as if one living, not mechanical, entity, act on the bottom of the bucket." (*ibid.*, p. 76).

to generate any new motion (only conserving the quantity of it that God has imparted to the world), More believes the absolute passivity of matter simply to mean that a particle all by itself could never transmit any of its motion at all. The first mention of this problem can be found as early as 1649 in a letter More sent to Descartes. There, he follows up with one more objection: in Descartes's metaphysical system, motion (just as rest) is a mode of substance and it is therefore quite unclear just how could either of them simply "jump" from one substance to another.<sup>20</sup> At the time of this correspondence, More was still very much in his earlier, Neo-platonic period and his solution to this problem reflects that. He proposes an emanationist theory in which there is no such thing as non-living matter – what we usually call body "is really a stupefied and sottish life, inasmuch as [...] it constitutes the last and faintest shadow and image of the divine essence, which I take to be the most perfect life."<sup>21</sup> The problem is thus solved, as there is in fact no transmission of motion and it is the "sottish life" of the particle that allows it to set itself into motion upon being hit.

Later, More himself grew dissatisfied with this solution because such a vitalism could easily create the impression that matter all by itself is enough to explain all forms of life thus threatening the belief in immaterial substances and God.<sup>22</sup> The new explanation of this "action through contact problem" that More brings to the table is – again – the "Spirit of Nature". This of course changes completely the dynamic between explanations by mechanical laws and by the "Spirit of Nature" and More himself admits this, confessing that he is "abundantly assured that there is no purely Mechanical Phenomenon in the whole Universe."<sup>23</sup> This heavily impacts both the question of distinguishing between mechanical and non-mechanical phenomena and the just mentioned analogy of the "Spirit of Nature" as if "enlivening" the non-living pieces of matter. While in so-called mechanical phenomena, the interaction of colliding pieces of matter may provide some sort of explanatory intermediary level, they are ultimately caused by the "Spirit of Nature" as well. On this intermediary level, a mathematical description may be available – that would be Descartes's mechanical laws, but that would also later be e.g. Newton's law of gravitation. As such, mechanicism may very

<sup>20</sup> More to Descartes, 23 Jul 1649, in: ADAM – TANNERY (eds.), *Oeuvres V*, p. 382ff.

<sup>21</sup> More to Descartes, 23 Jul 1649; English translation taken from Jasper REID, *The Metaphysics of Henry More*. Dordrecht: Springer 2012, p. 247.

<sup>22</sup> This change is related to the need to defend Christianity against a new threat, namely Spinoza's (perceived) divinization of matter.

<sup>23</sup> MORE, *Divine Dialogues*, The Publisher (More) to the Reader, p. viii (emphasis omitted).

well give us very exact predictions as to *what* is going to happen in some experimental setup but what is important for More is that if we want to know *how* it happens (on a metaphysical level), mechanicism cannot but remain silent and the real answer is going to be that it is the "Spirit of Nature" that "vivifies" and orders pieces of matter and their respective movements in such a way that makes the mechanical description possible.<sup>24</sup>

More even considered his theory of the "Spirit of Nature" to be open to (indirect) experimental verification. The aforementioned confutations in the *Enchiridion Metaphysicum* are not all on the level of metaphysical speculation. The chapters 12 to 22 are, among others, full of examples where More overcomes his dislike of experiments and gets into a very detailed analysis of experimental results to show how other, mechanistic, theories lead to consequences that blatantly contradict measured outcomes. As I already mentioned, More's method is mostly negative – he only shows that other theories fail to conform to the experience of our senses – but indirect as it may be, from More's point of view, this still is an experimental verification of the existence of the "Spirit of Nature".

In another famous example, he is convinced experiments prove that the "Spirit of Nature" has no free will, as it can sometimes work blindly against its own interest. For example, when we place an empty tube bottom up in water and close down the hole with a valve, the "Spirit of Nature" wants to balance up the difference of pressure. Yet, in trying to do so, it pushes water against the valve, thus preventing itself from accomplishing the very thing it tries to do. The laws according to which the "Spirit of Nature" acts in these cases are "certain general plastic reasons implanted in it by God and most useful to the common good of the universe and destined to it, and sufficiently accommodated to the end towards which they aim in the ordinary course of Nature."<sup>25</sup> But in such experiments, the "Spirit of Nature"

is beset and assailed by the ludicrous artifices and useless curiosities of the human mind, and is drawn or provoked by irritation to put forth the power of some general plastic reason in circumstances thought of and put forward perversely and sharply, [so] it is most wisely that, in applying those general laws of motion on a given occasion, it is ensnared and impeded so that it does not

<sup>24</sup> As we can see, with the only difference of replacing activity inherent to matter by the "Spirit of Nature", More's later position on this matter is quite similar to the one presented in the correspondence with Descartes.

<sup>25</sup> *Enchiridion Metaphysicum*, Scholia to chap. XIII, sec. 15 (JACOB, *More's Manual of Metaphysics* 2, p. 91).

attain the end to which those very laws naturally tend. All of which prove not, certainly, that the Hylarchic Principle [i.e. the “Spirit of Nature” – JJ] is nothing, but that it is not endowed with any counsel or reason or free judgement.<sup>26</sup>

Yet even from these considerations it is pretty clear that the experimental verification More was working with is a bit different from what we would usually expect. The “Spirit of Nature” was not for More a scientific object in the sense of being an object of scientific research. That is because More was not a physicist or a natural scientist, he was a metaphysician or, at best, a natural philosopher. Yet in natural philosophy, metaphysics and natural science are very often related, especially in More’s time, and the “Spirit of Nature” finds itself exactly at this point of junction. That is, I believe, what creates this sense of tension when speaking of the “Spirit of Nature” as a scientific object – even in the field of science, More’s motivation is always *metaphysical*. Yet insofar as the metaphysical foundations of science are a part of it, we have to consider the “Spirit of Nature” a scientific object; not necessarily something that science examines, but most definitely something that contributes in a non-trivial way to how science is structured.

If we then widen our view further, we may appreciate in which ways the “Spirit of Nature” impacts the overall shape of More’s metaphysical and natural philosophical system. First of all, there are the obvious theological implications – as has already been said, defending the existence of God was one of More’s *leitmotivs* and proving the existence of spiritual substances in general was the first step in doing that. More generally, the “Spirit of Nature” served in delimiting More’s overall metaphysical position. For one, he was very much aware of how dangerously close to pantheism his system may seem to some and the “Spirit of Nature” was definitely one of the tools that allowed More to subtly navigate his position between extremes that he wanted to avoid (like pantheism or materialism). On a less metaphysical note, the “Spirit of Nature” allowed More to group a certain set of phenomena by postulating a common, hidden cause for them. In this context, it should also be noted that most of the phenomena concerned were notoriously problematic for 17<sup>th</sup> century science (like gravitation or magnetism) and besides theories like those of Descartes (of gravitational vortices or magnetic effluvia), a lot of explanations considered were non-mechanistic (Kepler’s or Gilbert’s, to cite a few). All things considered, More’s spiritualistic theory was not necessarily worse than any of these.

<sup>26</sup> *Ibid.*

### III. Newton's Aether

To resume the first part of my paper, I tried to present the position of the "Spirit of Nature" within More's system and to show why and how it in fact worked as a scientific object. The "Spirit of Nature" grouped a set of phenomena and provided a unified explanation for them, one More believed could be confirmed by experimental data. At the same time, I have shown in what respects these reasons do not correspond to the expectations of modern science. These stem mostly from the sort of explanation the "Spirit of Nature" provided. For More, explanations in natural philosophy had to lead back to metaphysical causes behind the phenomena and as soon as modern science turned to explaining by presenting mathematical descriptions of observed regularities, the "Spirit of Nature" became just an extravagant metaphysical hypothesis. I would now like to turn my attention to Isaac Newton. While he is often regarded as a representative of the "new" approach in experimental philosophy (as I have mentioned above), he was still very much concerned with metaphysical matters and in these, similarities can be found between him and More that may throw an interesting light on the possible influence of the "Spirit of Nature" on the birth of modern science.

But let me first make a couple of tangential remarks concerning the further fate of action through contact. Initially, corpuscularists (just as we saw with Descartes) weren't much open to perceiving action through contact as somehow problematic or needing any further explanation, even more so after the publication of Newton's *Principia* and what some saw as the introduction into physics of forces acting at a distance. For many authors, the only acceptable interpretation of forces acting at a distance was one that reduced them to a series of immediate impulses in a medium linking the point of origin with the point where the force acts. In such a framework, action at a distance is the *explanandum* and action through contact the *explanans* that doesn't itself need any further explanation. Later throughout the 18<sup>th</sup> century, the idea of action at a distance slowly became more and more generally accepted, both among physicists and among philosophers. In this new ideological landscape, the perception of the problem of action through contact changed yet again. First of all, if action at a distance is accepted, there is no reason to problematize action through contact as it can be seen as just a limit case of action at a null distance.<sup>27</sup> This eventually led to a concep-

<sup>27</sup> The other way round, since matter is impenetrable, even when hitting each other, two particles still don't *actually share* any point of space. Therefore, even action through contact is ultimately a form of action at a distance (Cf. Immanuel KANT, *Metaphysical Foundations of*

tion of matter where the ability to act at a distance was not perceived as a superadded occult quality but rather as one of its intrinsic properties.<sup>28</sup> On a more purely metaphysical level, action through contact fades into a much more general problem of causal relationship that becomes more and more popular, proceeding (as we saw) from the question of mind-body interaction in Descartes, through occasionalism up to such philosophers as Hume or the already mentioned Immanuel Kant. Even later on, the whole situation gets further complicated with the introduction of various field theories. These at first sought to postulate some form of material substratum (mostly ether) for themselves, effectively reducing action at a distance to material action through contact again. Later, however, they became much more abstract (for Feynman, for example, a field is simply “any physical quantity which takes on different values at different points in space”<sup>29</sup>). As entities that are in a sense immaterial, they thus ultimately present yet another way of treating action through contact thanks to the fact that they can really be at the exact same place as the affected particle.<sup>30</sup> To conclude this little detour, let me just add that the problem of action through contact resurfaced in a much different context in the beginning of the 20<sup>th</sup> century with the advent of quantum mechanics and the related problems of locality and separability<sup>31</sup> but these are all subjects that would take us too far from our main focus.

Let us then proceed to Isaac Newton. A lot has already been written on possible connections between him and Henry More.<sup>32</sup> They certainly must have met during the time they both were at Cambridge. Although Newton read at least some of More’s works, explicit mentions of him are absent from his printed works and rather sporadic in the manuscripts (but then again in

*Natural Science*. Cambridge: Cambridge University Press 2004, p. 51 [513]). A modern version of the same argument is analyzed in Marc LANGE, *An Introduction to the Philosophy of Physics: Locality, Fields, Energy and Mass*. Oxford: Blackwell 2002.

<sup>28</sup> See Roger J. BOSCOVICH, *A Theory of Natural Philosophy*. Chicago: Open Court Publishing 1922, and more notably KANT, *Metaphysical Foundations of Natural Science*, for two different attempts at building such a theory of matter.

<sup>29</sup> Richard FEYNMAN, *The Feynman Lectures on Physics Vol II* [online]. 1970. Available at: <[http://www.feynmanlectures.caltech.edu/II\\_01.html#Ch1-S2](http://www.feynmanlectures.caltech.edu/II_01.html#Ch1-S2)> [retrieved 30. 10. 2016].

<sup>30</sup> For more on this, see Mary B. HESSE, *Forces and Fields. The Concept of Action at a Distance in the History of Physics*. Mineola: Dover 2005, chap. 8.

<sup>31</sup> See for example LANGE, *An Introduction to the Philosophy of Physics*, and Bernard d’ESPAGNAT, *On Physics and Philosophy*. Princeton: Princeton University Press 2006.

<sup>32</sup> The classical references are Alexandre KOYRÉ, *From the Closed World to the Infinite Universe*. Baltimore: The John Hopkins Press 1957, and Edwin A. BURTT, *The Metaphysical Foundations of Modern Physical Science*. London: Kegan Paul 1925.

general, Newton only rarely quotes or mentions any of his contemporaries). It is generally taken for granted that Newton's conception of absolute space as the *sensorium* of God is heavily inspired by More's *Enchiridion Metaphysicum* but otherwise, scholars have been rather careful when trying to trace More's possible influences on Newton, especially given the fact that More was not the only Cambridge Platonist and a lot of things Newton might have taken from him, he might just as well have taken from at least several other people, like Isaac Barrow or Ralph Cudworth (not to mention possible shared older, Stoic or Neo-Platonic sources). Especially with this last point in mind, it is not my intention to make any strong claims about links between More and Newton. As I already pointed out, the "Spirit of Nature" is part of a family of notions of a *spiritus mundi* or *pneuma* with a tradition ranging back at least to Ancient Neo-Platonists and Stoics. Just like More, Newton was familiar with this tradition and it has already been argued that it had some influence on his metaphysical ideas. What I would like to do in this part of my paper is to show a reading of Newton where his attempts at coming up with a cause of gravity are analogical to More's attempts of introducing the "Spirit of Nature", the differences being ultimately only ones of emphasis – on mathematical descriptions of regularities amongst phenomena for Newton, and on a coherent metaphysical system as a whole for More. Should this reading be correct, it would allow us to see Newton in a bit of a different light, as well as further highlight the respects in which the "Spirit of Nature" both can and cannot be considered a scientific object. From a more historical point of view, it might also serve as at least circumstantial evidence of More's possible influence on Newton.<sup>33</sup>

What cause Newton might have attributed to gravity is one of the most notorious subjects of Newton scholarship and it is not possible for us to fully enter into it. The two classical interpretations are that Newton was convinced that gravity had to have a mechanical cause or that its immaterial cause was God.<sup>34</sup> One of the *loci classici* of the debate is Newton's correspondence with

<sup>33</sup> It should be noted, in this context, that there is a very close relationship between absolute (divine) space and the "Spirit of Nature" that are both crucial elements of More's (late) philosophical system. See JACOB, *More's Manual of Metaphysics 1*, p. xxxviff.

<sup>34</sup> See e.g. Richard S. WESTFALL, *Never at Rest. A Biography of Isaac Newton*. Cambridge: Cambridge University Press 1983; Alexandre KOYRÉ, "Gravity an Essential Property of Matter?" In: Alexandre KOYRÉ, *Newtonian Studies*. London: Chapman & Hall 1965; I. Bernard COHEN, "Newton's Third Law and Universal Gravitation." In: SCHEURER, P. B. – DE BROCK, G. (eds.), *Newton's Scientific and Philosophical Legacy*. Dordrecht: Kluwer 1988, pp. 25–53. A good survey of the earlier phase of this debate can be found in John HENRY, "Pray Do Not Ascribe That Notion to Me: God and Newton's Gravity." In: FORCE, J. E. –

Richard Bentley where Newton repeatedly denies that gravity should be “essential and inherent to Matter”.<sup>35</sup> In the following letter, Newton elaborates on that subject:

It is inconceivable, that inanimate brute Matter should, without the Mediation of something else, which is not material, operate upon, and effect other Matter without mutual Contact, as it must be, if Gravitation in the Sense of Epicurus, be essential and inherent in it. And this is one Reason why I desired you would not ascribe innate Gravity to me. That Gravity should be innate, inherent and essential to Matter, so that one Body may act upon another at a distance thro’ a Vacuum, without the Mediation of any thing else, by and through which their Action and Force be conveyed from one to another, is to me so great an Absurdity, that I believe no Man who has in philosophical Matters a competent Faculty of thinking can ever fall into it. Gravity must be caused by an Agent acting constantly according to certain Laws; but whether this Agent be material or immaterial, I have left to the consideration of my Readers.<sup>36</sup>

Given the failure of mechanical explanations (a material aether would slow down the course of planets), this passage was often taken to mean that the only option left is for there to be an immaterial principle causing gravitational attraction. Now although most scholars have immediately identified this principle as God, the connection does not seem so certain. In one of the more refined versions of this argument,<sup>37</sup> Betty Jo Teeter Dobbs, using the so-called Classical Scholia, quite convincingly shows influences of ancient theories of *pneuma* and *spiritus mundi* on Newton’s thoughts on the subject of gravity. The last step, however, identifying (in Newton’s view) this ancient *pneuma* with the Christian God, still seems unwarranted and based mostly on too literal an understanding of God’s omnipresence and of space as His *sensorium*. This idea definitely seems at odds with the conception of God’s transcendence Newton seems to have held.<sup>38</sup>

POPKIN, R. H. (eds.), *The Books of Nature and Scripture. Recent Essays on Natural Philosophy, Theology, and Biblical Criticism in the Netherlands of Spinoza’s Time and the British Isles of Newton’s time*. Dordrecht: Springer 1994, pp. 123–147.

<sup>35</sup> I. Bernard COHEN (ed.), *Isaac Newton’s Papers & Letters on Natural Philosophy*. Cambridge, MA: Harvard University Press 1978, p. 298.

<sup>36</sup> COHEN (ed.), *Isaac Newton’s Papers & Letters*, p. 302f.

<sup>37</sup> Betty J. T. DOBBS, “Newton’s Alchemy and his ‘Active Principle’ of Gravitation.” In: SCHEURER – DE BROCK (eds.), *Newton’s Scientific and Philosophical Legacy*, pp. 55–81.

<sup>38</sup> This is conclusively argued in HENRY, “Pray Do Not Ascribe That Notion to Me,” p. 132f.

According to Newton, God is *actually* present everywhere in the world, yet He certainly doesn't bother with *directly* causing gravitation or other natural phenomena. For More, this is exactly where the "Spirit of Nature" comes in – a notion, I might add in reference to B. J. T. Dobbs's article, that as we have seen is a direct descendant of the stoic *pneuma* or Neo-Platonic *spiritus mundi*. Given the gratuity of the jump from immaterial substance to God himself, the question we should ask is whether all the evidence that Dobbs has gathered doesn't actually point rather in the direction of a spiritual agent similar to the "Spirit of Nature".<sup>39</sup>

Pursuing this line of thought further, I think we might find it sheds some new light on other related subjects. At this point, it is very important to realize that both the *pneuma* and the *spiritus mundi* were entities traditionally considered to have an intermediary status between body and spirit, being in certain respects both, in others neither one nor the other.<sup>40</sup> This position is still very clearly visible in More's early philosophical poems, where e.g. the "Mundane spirit" is defined as "that which is the spirit of the world, or Universe. I mean by it not an Intellectual spirit, but a fine unfixt, attenuate, subtill, ethereall substance, the immediate vehicle of plasticall or sensitive life."<sup>41</sup> And although later, as we saw and under the influence of Descartes, More opted for a much more radical dualism, the "Spirit of Nature" remains a somewhat problematic entity in that it still bears some residual marks of its original ambiguity. In a similar fashion, we don't necessarily have to see Newton's possible solutions as divided into two radically separate branches (material or immaterial) but rather as complementary attempts at describing, in terms of 17<sup>th</sup> century dualism, such an intermediate, partly material, partly spiritual concept.

As I have already mentioned, any material theory of a gravitational aether had to account for the fact that this aether does not also significantly slow down the planets. This seems to be the main problem why Newton renounced a material cause of gravity in the first place, and it is also the reason why, when he came with another take on the aether in the "aether queries" of the 1717 edition of the *Opticks*, he explicitly defined this "new" aether as so extremely rarefied that it couldn't possibly affect the movement of the plan-

<sup>39</sup> In a different article, though, Dobbs presents a similar argument without this last identification of the *pneuma* with God (Betty J. T. DOBBS, "Newton's Alchemy and his Theory of Matter." *Isis*, vol. 73, 1982, no. 4, pp. 511–528).

<sup>40</sup> This point is several times emphasized also by Dobbs (DOBBS, "Newton's Alchemy and his Theory of Matter," p. 523 or 526f.).

<sup>41</sup> Henry MORE, *Philosophical Poems*. Edinburgh: Edinburgh University Press 1878, *Interpretation Generall*, p. 163.

ets. He speaks of a medium “700 000 times more elastick than our Air, and above 700 000 times more rare [...]. And so small a resistance would scarce make any sensible alteration in the Motions of the Planets in ten thousand Years.”<sup>42</sup> To explain this rarity, Newton claimed the particles of aether had to “endeavour to recede from one another.”<sup>43</sup> This is a little awkward as it seems to make the aether itself depend on forces acting at a distance, thus circularly relying on what it was supposed to explain. Steffen Ducheyne pointed out that this aether doesn’t necessarily have to be material<sup>44</sup> but then the question would be how such an immaterial aether can still be composed of particles. Yet if we accept with B. J. T. Dobbs that Newton’s thinking about the cause of gravity grew from traditional *aether* and *pneuma* theories and if we fully accept that these traditional conceptions defied strictly dualistic categorization, we may take the *Opticks* aether to be yet another attempt of describing such an ambiguous concept in scientific terms. In this context, it should also be noted that traditional descriptions of this intermediary aether make use of the same metaphor (though less “mathematized”) – the aether is a spirit, yet so gross it is almost a body; and a body but one so subtle and *so rare*, it is almost a spirit.<sup>45</sup>

Such an understanding would also help make a much closer link between Newton’s “mechanistically inspired” material aether and the aether of his earlier, alchemical works. It is by now generally accepted that Newton’s alchemical studies were the source of a lot of his later ideas in physics but a huge discontinuity is perceived between the alchemical aether and that of the *Opticks*.<sup>46</sup> Although it is true that the aether of *The Vegetation of Metals* is not described as composed of particles endowed with repulsive forces, Newton does say it is “by many degrees more thin & rare than air”<sup>47</sup> and he also connects it to the same phenomena as in the *Opticks* (light, heat, magnetism but also vegetative life!). This alchemical aether is also described as

<sup>42</sup> Isaac NEWTON, *Optics*. Mineola: Dover 1952, p. 352f.

<sup>43</sup> *Ibid.*

<sup>44</sup> Steffen DUCHEYNE, “Newton on Action at a Distance and the Cause of Gravity.” *Studies in History and Philosophy of Science Part A*, vol. 42, 2011, no. 1, pp. 154–159.

<sup>45</sup> Cf. Eric R. DODDS – PROCLUS, *The Elements of Theology*. Oxford: Clarendon Press 1963, p. 315.

<sup>46</sup> See for example John HENRY, “Gravity and De Gravitatione: The Development of Newton’s Ideas on Action at a Distance.” *Studies in History and Philosophy of Science Part A*, vol. 42, 2011, no. 1, pp. 11–27.

<sup>47</sup> Isaac NEWTON, *The Vegetation of Metals*. Dibner Collection, Smithsonian, MS 1031 B, 3v [online]. 1674?. Available at: <<http://webapp1.dlib.indiana.edu/newton/mss/norm/ALCH00081>> [retrieved 7. 11. 2016].

"the material soule of all matter" or "a vehicle to some more active spirit,"<sup>48</sup> quite clearly demonstrating its intermediate corporeo-spiritual character. All these, as many other expressions found in the manuscript, could also have been taken straight from any of More's early works – or from other Cambridge Platonists', for that matter. The point, here again, is not to claim any direct influence of More on Newton, but rather to open up a new point of view on Newton's aether through showing the functional similarities between it and More's "Spirit of Nature".

Besides these similarities, however, there are also differences; differences that again relate to the shift from natural to experimental philosophy. More's primary concern was metaphysics while Newton, though also obviously concerned with such matters, tried to keep them away from his more mathematical and physical research. In this sense, the law of gravitation was more important for Newton than any metaphysical principle we may try to put behind it. And without trying to reduce the importance of the metaphysical and alchemical part of Newton's thinking, without – as has so often been done – trying to make Newton into "the first positivist", it seems quite clear this shift of focus was at least in part due to the fact that he considered these mathematical questions more fit objects of scientific research.

At the same time, Newton obviously looked for an (at least partially) immaterial cause of gravity and while I agree with Dobbs that this immaterial cause drew on traditional conceptions of *pneuma* and *spiritus mundi* (possibly at least partially mediated by Henry More), I do not think however that Newton identified this cause with God. What, then, would this immaterial agent be? For More, it was an omnipresent and blindly programmed "Spirit of Nature". For Newton, it might have been something similar, or possibly a not completely material aether, as the one described in the *Opticks*. Through all their superficial differences, all these options would be (on our reading) just different attempts at adapting the traditional conception of a *pneuma* or *spiritus mundi* to the framework of the new physics.

## Conclusion

While it doesn't seem obvious from the point of view of contemporary science, animistic and spiritual notions had for a long time a strong influence on the problems of action at a distance<sup>49</sup> and in a way, this article may be

<sup>48</sup> *Ibid.*, p. 4r.

<sup>49</sup> See HESSE, *Forces and Fields*.

considered a more detailed case study of one such example. We have seen Henry More's "Spirit of Nature" as a late fruit of a tradition of notions of *spiritus mundi* used within an early modern context as an explanation for various seemingly non-mechanical phenomena. I have tried to show, on the one hand, in which respects it may be considered a scientific notion and, on the other hand, in which respects it may not. Of course, these considerations depend a lot on our expectations of what science ought to do and, during More's lifetime, these expectations were undergoing quite a radical change. The "Spirit of Nature" thus worked as a scientific object in that it provided an explanation of the metaphysical workings behind various phenomena (mechanical or not). Most notably, it "explained" action through contact, thus effectively providing the grounding underlying any mechanical explanation at all. Yet it never had the possibility of fully entering the discourse of science, because it is exactly this connection with metaphysics that later science tried to sever under the famous motto "*hypotheses non fingo*". Fun- nily enough, for Newton himself, though he was very careful about "framing hypotheses", metaphysical concerns, though not part of the mathematical treatment of the given questions, were still very important.

A comparison between More's "Spirit of Nature" and Newton's inquiries into the cause of gravity seems to vindicate B. J. T. Dobbs's claim that Newton drew from theories of *pneuma* or *spiritus mundi*. Furthermore, we should keep in mind that this concept was traditionally one of an intermediate substance between matter and spirit – the traces of which ambiguity can, in my opinion, be traced both in More and Newton, even though both seem to work in a more or less dualistic framework. Under this perspective, Newton's various attempts at providing a metaphysical explanation of the cause of gravity are ultimately only attempts to fit this intermediate concept into the new science. In this sense, these attempts are similar to what More tried to do with his "Spirit of Nature", although both the specific ways of accommodating the given concept and what either author perceived to be what ultimately matters are different. These similarities and differences allows us to see how close and at the same time distant More and Newton were and, regardless of any possible direct influence of More on Newton, they also let us appreciate how "spiritual successors" to the "Spirit of Nature" helped shape the face of modern science.