

ISSN 0080-3073



VOLUME  
LI

Rinascimento



Olschki  
2011

ISTITUTO  
NAZIONALE  
DI STUDI  
SUL  
RINASCIMENTO



Seconda Serie  
VOLUME LI

# Rinascimento

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Leo S. Olschki Editore

2011

QUOD NESCIS QUOMODO FIAT, ID NON FACIS.  
OCCASIONALISM AGAINST DESCARTES?

ABSTRACT. – Post-Cartesian Occasionalism argues that the power of causing an effect depends on knowledge of the means by which the effect is produced. The argument is used to deny finite beings the power to act. Arnold Geulincx expresses this thesis in the principle *Quod nescis quomodo fiat id non facis*. Here, my purpose is to show that:

1. The philosophical problem that is at the origin of the principle *Quod nescis quomodo fiat id non facis* originates in Galen's *De foetuum formatione*, a work translated into Latin only in 1535.

2. Important works of early modern philosophy, such as Campanella's *Del senso delle cose e della magia*, discuss Galen's text.

3. Due to their rejection of teleology, Descartes' physics and metaphysics are completely foreign to the *Quod nescis* principle. Comparing the Cartesian theory of animal-machines with the theory of animal behavior of Pierre Chanet, a philosopher who adopts the principle, confirms this claim.

1. *The formulation of the principle*

The formulation of the principle *Quod nescis quomodo fiat id non facis* is traditionally attributed to Arnold Geulincx.<sup>1</sup> The principle appears for the first time in a physics dissertation written in 1663, and both *Ethics* (1665) and *Metaphysica vera* (published posthumously in 1691) state it.<sup>2</sup> The principle is included in a Cartesian context only in this last text: the title of the first chapter – or *prima scientia*, as Geulincx calls it –, is *Cogito*

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<sup>1</sup> A. DE LATTRE, *L'Occasionalisme d'Arnold Geulincx*, Paris 1967, pp. 365-412.

<sup>2</sup> A. GEULINCX, *Disputatio physica* 3, in EIUSD. *Opera Philosophica*, 3 vols., recognovit J. P. N. LAND, The Hague 1891-93; Stuttgart 1968, II, pp. 502-503; ID., *Ethica, First Treatise*, in *ibid.*, III, 30-37; ID., *Annotationes*, in *ibid.*, III, 203-222; ID., *Metaphysica vera*, in *ibid.*, III, pp. 147-157.

*ego sum*;<sup>3</sup> the second chapter makes it clear that the nature of the Self is conscious thinking. Finally, the fourth chapter prepares for the formulation of the principle, stressing that mind and body are heterogeneous: the Self has modes of thought that do not depend on the Self as *res cogitans* – writes Geulincx – that is, all involuntary thoughts. These thoughts might depend on the body, but it is not clear how the body could cause these thoughts, in that «I don't see in [the body] any proportion or power able to produce that effect».<sup>4</sup> As we see, the first reason Geulincx offers to exclude that it is the body that causes involuntary thoughts, i. e. the lack of proportion between mind and body, is rather Cartesian.<sup>5</sup> The fifth chapter, instead, leaves aside the dualist context and does not resort to the difference between mind and body to rule out that the body causes the mind to have involuntary thoughts: I myself do not trigger some thoughts, hence it must be someone else who does so, but this someone else «conscius esse debet hujus negotii; facit enim, et impossibile est, ut is faciat, qui nescit quomodo fiat».<sup>6</sup> It is necessary to be aware of the means by which an effect is produced to be able to produce it. Hence from I'll call this principle the 'epistemic condition of causality'.

Geulincx submits the epistemic condition of causality as a principle that doesn't need a proof: «This is a principle very evident by itself».<sup>7</sup> The following remarks reinforce the evidence of the principle, getting rid of prejudices that might have obscured it. When we correctly believe ourselves unable to heat or make light, Geulincx remarks, we believe this because we do not know what to do in order to produce heat or light. For the same reason it is not admissible to attribute to the sun or fire the ability to heat or produce light, because neither the sun nor fire knows how to produce those effects: «Quod nescis quomodo fiat, id non facis».<sup>8</sup>

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<sup>3</sup> GEULINCX *Opera Philosophica*, cit., III, p. 147.

<sup>4</sup> *Ibid.*, p. 150: «nihil in illo proportionis aut potentiae video ad negotium illud expediendum».

<sup>5</sup> To the lack of proportion between mind and body Geulincx adds that the body lacks the power (*potentia*) to produce these thoughts. The body's lack of power was an argument generally stressed by the first Occasionalists. See Louis de La Forge, *Traité de l'esprit de l'Homme*, published in 1666, in L. DE LA FORGE, *Œuvres philosophiques*, édition présentée par P. CLAIR, Paris 1974, pp. 237-238, and Gérald de Cordemoy, *Discernement du corps et de l'âme*, published also in 1666, in G. DE CORDEMOY, *Œuvres philosophiques*, édition critique présentée par P. CLAIR et F. GIRBAL, Paris 1968, pp. 135 ss.

<sup>6</sup> GEULINCX, *Metaphysica vera*, cit., III, p. 150.

<sup>7</sup> *Ibid.*

<sup>8</sup> *Ibid.*

Thus, dropping the original Cartesian context, which is centered around mind-body causation, the principle *Quod nescis quomodo fiat id non facis* is held as if it were sound for any causal relation, even that of bodies among themselves, or of voluntary actions, as already stressed in *Ethica*,<sup>9</sup> justifying adherence to an extreme form of Occasionalism which traces back to God any effect produced in nature.

The principle, which Geulincx stated as evident, was met with great success. Malebranche adopted it, adding the principle to the main arguments barring causality among finite beings.<sup>10</sup> The *Quod nescis* principle even became the main if not sole argument to which Pierre Bayle resorted in order to justify Occasionalism, setting aside all the arguments produced in their day by Louis de La Forge and Géraud de Cordemoy.<sup>11</sup>

Since in *Metaphysica vera* Geulincx framed the principle *Quod nescis* in a Cartesian context, its origin has been frequently located in Cartesian philosophy.<sup>12</sup> Here, I will suggest a completely different hypothesis.

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<sup>9</sup> See the first *Treatise of Ethica* II, II, 4-8, and the corresponding *Annotationes* 38-42 (GEULINCX *Opera Philosophica*, cit., III, pp. 30-37 and 203-222).

<sup>10</sup> N. MALEBRANCHE, *La recherche de la vérité* VI, II, III, in ID., *Oeuvres complètes*, éd. par A. ROBINET, Paris 1958-76 (OC), II, pp. 315-316, cit. *infra* p. 000; ID., *Eclaircissement XV*, in OC, III, p. 226: «Je voi même tres-clairement, qu'il ne peut y avoir de rapport entre la volonté que j'ai de remuer le bras, et entre l'agitation des esprits animaux, c'est à dire, de quelques petits corps, dont je ne sçai ni le mouvement ni la figure; lesquels vont choisir certains canaux des nerfs entre un million d'autres que je ne connois pas, afin de causer en moi le mouvement que je souhaite par une infinité de mouvemens que je ne souhaite point»; ID., *Méditations chrétiennes*, in OC, X, p. 62: «Peut-on faire, peut-on même vouloir ce qu'on ne sçait point faire?»; ID., *Entretiens sur la métaphysique et sur la religion*, in OC, XII-XIII, p. 167: «Je ne sçai pas même quelles doivent être les dispositions des organes qui servent à la voix pour prononcer ce que je vous dis sans hésiter». However, there is no certain evidence that Malebranche knew the texts of Geulincx in which the principle is contained, at least at the time of the first appearance of the principle in Malebranche's works, i. e. in the first edition of the *La recherche de la vérité*.

<sup>11</sup> S. NADLER, *The occasionalism of Louis de La Forge*, in ID., *Occasionalism*, Oxford-New York 2011, pp. 105-122. On Bayle and the *Quod nescis* principle see G. MORI, *Bayle philosophie*, Paris 1999, pp. 92-96.

<sup>12</sup> On the Cartesian origin of the principle, see M. GUEROULT, *Malebranche*, 3 vols., Paris 1955-59, II, p. 224, and especially DE LATTRE, *L'Occasionalism d'Arnold Geulincx*, cit., pp. 345 ss. See also V. NICUSANTI, *L'opera di Arnold Geulincx. Tra cartesianesimo e occasionalismo*, 2007 <http://www.uniurb.it/Filosofia/isonomia/>. A non-Cartesian origin of the principle is proposed by S. NADLER, *Knowledge, Volitional Agency and Causation in Malebranche and Geulincx*, in ID., *Occasionalism*, cit., pp. 74-87. Nadler draws attention to the medieval Arabic theologians who identified causality with a volitional and intelligent agency. However, Nadler does not claim that Geulincx or Malebranche had direct knowledge of these philosophers. Moreover, in the texts cited by Nadler, these philosophers maintain knowledge of the effect as a condition of causality, but they do not require knowledge of *the means* by which the effect is pro-

## 2. *At the origin of the principle*

Arguing for the *Quod nescis* principle, Malebranche points up the anatomical details barring the possibility that the will could have a causal effect on the body. Since in order to move a part of our body we are required to command many muscles and nerves, unknown even to the most refined anatomist, it is impossible for the mind to be able to perform any movement of the body:

For how could we move our arms? To move them, it is necessary to have animal spirits, to send them through certain nerves toward certain muscles in order to inflate and contract them, for it is thus that the arm attached to them is moved [...]. And we see men who do not know that they have spirits, nerves, and muscles move their arms, and even move them with more skill and ease than those who know anatomy best. Therefore, men will to move their arms, and only God is able and knows how to move them [...] there is no man who knows what must be done to move one of his fingers by means of animal spirits. How, then, could men move their arms?<sup>13</sup>

Geulincx already stressed the complexity of human body, arguing for the impossibility for the mind to know human body's mechanism, and by consequence, to cause body movements:

With what impudence will I dare say that I cause something that I do not know how to do? I do not know how, by what nerves and through which channels this motion is to be communicated from the brain into my limbs; I do not even know how it has come into the brain itself, nor even if it is there.<sup>14</sup>

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duced. And the knowledge of the means is exactly what the principle *Quod nescis* imposes as a condition for causality.

<sup>13</sup> MALEBRANCHE, *La recherche de la vérité* VI, II, III, in *OC*, II, p. 315; ID., *The Search After Truth*, translated by TH. M. LENNON and P. J. OLSAMP, Columbus 1980, pp. 449-450. Only in *Eclaircissement XV* (1712) does Malebranche stress the fact that a *finite* cause like human will cannot know and cause the movement of a number of *infinite* bodies. See MALEBRANCHE, *Eclaircissement XV*, cit., p. 228. In all precedent texts Malebranche was satisfied to stress the *great* number of body parts involved in the smallest movement. Therefore, the impossibility for a finite cause to know an *infinite* number of muscles, nerves etc. is only a late remark and it is not a necessary condition for assuming the *Quod nescis* principle. Stressing the infinite number of muscles, nerves etc. Malebranche strengthens the *Quod nescis* principle with his favorite epistemological argument, which denies the possibility of knowing the infinite through the finite.

<sup>14</sup> GEULINCX, *Ethica*, cit., p. 32 (I, II, II, 4). See also P. BAYLE, *Système abrégé de philosophie, La physique*, in ID., *Oeuvres diverses*, IV, Hildesheim 1968, p. 462a: «l'ame à la vérité n'est pas la cause physique de ce mouvement [...] puisque pour remuer le bras, il faut plus

The emphasis on anatomical details is a helpful guide in searching for the starting point of the argument on which the *Quod nescis* principle was based. Following this guide, I suggest that we take a look at the author who, in antiquity, planned the development of anatomical studies of the human body, i. e. Galen.<sup>15</sup> As we will see, Galen's work is closer in time to Geulincx, Malebranche and Bayle than we might imagine.

As is well known, Galen was, even in relation to Aristotle, proud of his contribution to advances in the practice of dissecting animals, as well as to knowledge of animal and human anatomies. The anatomical knowledge he gathered influenced the challenge Galen posed to philosophers in a short text on the formation of the fetus, *De foetuum formatione*.<sup>16</sup> Galen looks at embryology as a new and more problematic frontier for explaining natural phenomena. Galen shows great contempt for those who, responding to the difficult questions posed by embryology, appeal generically to 'nature'. This word, according to Galen, does not express a clear concept: «[philosophers] retained it unnecessary, after having stated that the fetus is formed by nature, to put forth anything more than that term commonly known to everybody».<sup>17</sup> However, it is not only the fetus formation to look a difficult problem for science and philosophy. Also trivial animal bodies' movements seem equally mysterious. And Galen refers to everyone's experience to call due attention to the complexity of the more common events in nature. In fact, in a few pages, the problem of a satis-

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d'art que l'ame n'en peut avoir sans une longue etude»; and ID., *Réponse aux questions d'un provincial*, in *ibid.*, III, Hildesheim 1966, p. 786b.

<sup>15</sup> As far as I know, Georges Canguilhem has been the only scholar who noticed the close resemblance between Galen and Malebranche. The remark by Canguilhem has, however, been neglected by Occasionalism scholars. See G. CANGUILHEM, *La formation du concept de réflexe aux XVII<sup>e</sup> et XVIII<sup>e</sup> siècles*, Paris 1955, p. 17: «Dans le chapitre VI du *De foetuum formatione libellus*, Galien est conduit à traiter de la motion du corps par l'âme. La difficulté est d'expliquer comment l'âme intelligente peut mouvoir le corps d'après la connoissance des organes et de leurs fonctions, ce qui revient à supposer dans l'âme du premier venu une connoissance anatomique et physiologique bien supérieure à celle des meilleurs anatomistes qui savent à peine, d'après des dissections, la fonction propre de chacun des muscles. Cet argument traversera les siècles et on le retrouvera, inchangé, chez Malebranche à l'appui de la thèse que seul le Créateur des corps peut et sait en être le Moteur». I owe this reference to Andrea Sangiacomo.

<sup>16</sup> CLAUDIO GALENO, *De foetuum formatione*, edidit, in linguam germanicam vertit, commentatus est D. NICKEL, Berlin 2001. Latin text in CLAUDII GALENI *Opera Omnia*, editionem curavit D. CAROLUS GOTTLLOB KÜHN, Tomus IV, Lipsiae, literis Frider. Chr. Dürrii 1822, pp. 652-702.

<sup>17</sup> *Ibid.*, pp. 90-92; ed. Kühn, p. 687: «[...] si a natura foetum formari dicant, nihil sane se amplius quam nomen omnibus consuetum dixisse. Nemo enim tam stolidus est, ut non intelligat, quandam foetus generationis causam esse, quam omnes naturam appellamus, quae ejus sit substantia, ignorantes».

factory explanation of fetus formation becomes only one case of a much broader problem involving accounting, in general, for body movements and, in particular, for voluntary ones. Galen attributes to backwardness in the field of anatomy on the part of the philosophers who preceded him the fact that no one had wondered why

not only we, but even newborn babies and children, when asked to open or close a finger, do it immediately, *without knowing which muscle moves the finger* [...] everybody thinks it is marvelous that a young boy, as soon as he hears the word 'bread', repeats it *without knowing how the tongue is to be placed nor which muscles make it perform the different movements*. [...] It is extremely hard to explain why, whenever we want to move a limb in any way, it immediately moves, *although we do not know what muscle makes it move* [...].<sup>18</sup>

Ignorance of anatomy once precluded wondering about these events, and asking how it is possible to move a limb without any knowledge of muscles, tendons and their workings. But Galen's researches revealed the extraordinary complexity of the body, and dramatically posed the question of how it is possible to move one part of the body, ignoring the plenty of muscles and nerves necessary to produce this effect. The emphasis on the multiplicity of muscles involved in animal body movement that we have seen in Geulincx and in Malebranche was already in Galen, who stressed this fact glorifying the wisdom of the artificer who planned animal bodies:

In an animal body there are more than three hundred muscles, which moves the limbs following the will [...]. But, if we carefully look at the structure of

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<sup>18</sup> *Ibid.*, pp. 94-96; ed. Kühn, pp. 689-693: «Proponatur primum manus, quae omnes digitos tribus ossibus compositos atque inter se articulis commissos habet; in quibus nimirum primum exerceri satius esset illos, qui coelum ac mundum universum erant contemplaturi, quomodo scilicet sint fabricati, quibusque instrumentis motus ipsis accederet; quomodo aliquando articulis vel simul omnibus vel privatim singulis extenderentur, aliquando in latus flecterentur, idque dupliciter, vel ad parvum vel ad magnum digitum. Si enim novissent per musculos omnes hos motus fieri, nobis ignorantibus, priusquam per dissectionem in conspectum venissent, admirati sane essent, quomodo non solum nos, sed parvuli etiam infantes, quomodo aliquem digitum vel extendere vel inflectere jubentur, statim id faciant, *licet moventem musculum non cognoscant*. Quod in lingua magis adhuc mirabile est, de cuius musculorum numero inter anatomicos non convenit; tantum abest, ut eos, qui singulis motionibus praesunt, certo cognoscant [...]. Mirum autem illud omnes putant, parvum puerulum, ubi audiverit hanc vocem, panis, quomodo *neque quomodo lingua figuretur cognoscat, neque a quibus musculis ad singulas vocum motiones agatur*, eam, imo tutum etiam deiceps versum exprimere; in qua re lingua multas mutationes singulis vocibus accommodatas moliat. [...] Cur, ubi partem aliquam movere voluerimus quocunque modo, ea statim moveatur, *licet moventem musculum non agnoscamus*, longe difficillimum est; vix enim ex dissectione anatomicis propria uniuscuiusque muscoli functio inventa est» (Emphasis mine).

the three hundred [muscles], each of which attains at ten goals, we arrive at the number of three thousands [...] and if someone would like to number the goals of each structure, those that have attained the highest perfection will attain the number of ten thousands, not thousand, which, as I have said, I cannot believe not to be the work of a very wise and powerful author.<sup>19</sup>

Facing such ordinary and mysterious phaenomena, as appropriately moving the many tongue muscles, for example, so as to utter a word, which any child can easily do, or to bend a finger, as Malebranche will repeat, Galen surveys the conjectures which have been or could be advanced on the subject. The gods could have initially endowed bodies with movement without any further intervention; the world, as the human body, could be directed by a soul; each of the many moving muscles could be an animal wisely obeying the orders of human will. All these conjectures are carefully reviewed, and, as each one encounter insurmountable difficulties, Galen discards all of them. It would seem impossible for each muscle to be an animal, given the numerous variety of muscles which uttering a single word requires.<sup>20</sup> Nor is it conceivable that a single soul form and govern our limbs: «The soul that rules us *seems not to have knowledge of the parts which obey its stimuli, which is evidence against that view*».<sup>21</sup> Finally, the hypothesis of an intelligent god who

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<sup>19</sup> *Ibid.*, pp. 96-98; ed. Kühn, pp. 693-695: «in animalis corpore musculi sunt multo plures quam trecenti illi, qui pro voluntate partes movent [...]. Attamen, si trecentarum partium structurae, singulae decem scopos obtinentes, in totum sint absolutae, ad trium millium numerum omnes evadent. [...] si quis scopos uniuscuiusque structurae numerare velit, numerus omnium integre absolutorum, in dena millia, non millia, redigatur, quos ego nequaquam, ut dixi, nisi a sapientissimo ac potentissimo opifice factos esse crediderim».

<sup>20</sup> *Ibid.*, p. 96; ed. Kühn, pp. 690-691: «Quidam fuit, qui dixit, unumquemque musculum quasi animal voluntatem nostram persentientem attrahere ac circumducere linguam in convenientem figuram ad vocem exprimendam; atque hoc omnibus aliis probabile minime videtur. [...] Caeterum quum plures quam trecenti musculi in nobis sint, non est sane credendum, unumquemque ex ipsis animal esse».

<sup>21</sup> *Ibid.*, p. 100; ed. Kühn, pp. 696-697: «Nam quum puerulos videamus sonare, quaecunque eos iusserimus, verbi gratia smyrnam, scalpellum, smegma, neque tamen musculos, qui linguam commode, ut haec vox exigit, movent, *multo minus etiam nervos cognoscere*, maxime probabile existimo esse, illum, qui linguam nostram finxit, quicumque is fuerit, vel ipsum adhuc in formatis partibus permanere, vel partes ipsas animantia constituisse, quae voluntatem principis partis animae nostrae cognoscerent. [...] Quum enim audio, quosdam philosophos dicere, materiam animatam, quae ab aeterno est, in ideas respiciendo se ipsam exornare, magis adhuc intelligo, unam oportere esse animam, quae et nos formet, et quae singulis particulis nunc utatur. Huic autem opinioni adversatur, quod, quae nos regit anima, *appetitionibus ipsius inservientes partes ignoret*». And pp. 692-693: «Sed cur, ubi partem aliquam movere voluerimus quocunque modo, ea statim moveatur, *licet moventem musculum non agnoscamus*, longe difficillimum est; vix enim ex dissectione anatomicis propria uniuscuiusque musculi functio inventa est» (Emphasis mine).



first endowed the world with physical movement and then lost interest in its workings suggests, for Galen, a magical transmission of movement, and hence has no place in science. Moreover, this conjecture ascribes an irrational cause to the transmission of movement, returning to the Epicurean hypothesis of a casual origin of life and of the order of nature, which is the hypothesis that Galen intended, first and foremost, to reject, agreeing here with both Plato and Aristotle.<sup>22</sup> Galen concludes aporetically: philosophers have been unable to answer his questions, but the problem has been posed. Finding the cause of the simplest body movements requires individuating an intelligent cause which knows how these movements are effected, and this intelligence is lacking in the mind of a little boy who utters the word 'bread' moving a prodigious quantity of muscles.<sup>23</sup>

Let us come back to the reason through which Galen discards the conjecture that one single soul could form and move the human body: «The soul that rules us *seems not to have knowledge of the parts which obey its stimuli*, which is evidence against that view». It seems impossible to Galen that a being who has no knowledge of the means by which a part of his body moves, can be able to move it. Voluntary movements, however, are only an example, chosen for its evidence, of how difficult it is to find the cause of movements in a living body, as the case of fetus' formation shows. If Galen does not have an answer to the question of what cause a living body movements, he is at least persuaded that no available philosophical conjecture yield knowledge of the means that produce the movements. Indeed, knowledge of these means is a necessary condition of this kind of causality.

As Geulincx, Galen doesn't explain why the epistemic condition of causality looks so evident to him. This condition is at work in raising a problem and discarding some solutions, but is never justified. Why, we wonder, is the epistemic condition so evident to Galen?

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<sup>22</sup> *Ibid.*, p. 92; ed. Kühn, pp. 688-689: «Atqui necessarium est, aut ex motu quodam irrationali et inartificioso foetuum formationem optimum finem consequi, aut, quemadmodum qui miracula moliuntur, ubi motus initium ipsis exhibuerint, ipsi quidem discedunt, opificia vero ipsa ac machinae aliquousque non multo tempore artificiose moventur, ita etiam deos, postquam stirpium animaliumque semina in tantam motuum successionem idonea praepararint, nihil praeterea ipsos agere. [...] Quemadmodum enim optimum est nusquam in tanta partium copia casu delinquere, ita etiam artificiosam motus consequentiam ab irrationali quadam fieri substantia, quemadmodum ipsi dicunt, affermare temerarium est».

<sup>23</sup> *Ibid.*, p. 96; ed. Kühn, pp. 690-691. See *supra* note 18.

The answer to the question lies in the metaphysical framework of Galen's work. Galen was not only a great anatomist; he was also the author of an ambitious philosophical project, aiming at merging Aristotelian biology with Platonic metaphysics, introducing or rather reintroducing an intelligent mind, a demiurge, to account for the order of nature. The dialogue with Aristotle, and in particular with his biological writings, is the framework of the questions Galen raises in his embryological essay. As a matter of fact, Galen rewrote the Aristotelian *On the Parts of Animals* in his great opus *De usu partium*, a work whose conceptual core is evident in its very title, assuming, as a central point of biology, the Aristotelian thesis according to which the aim of parts is their function, i. e., their *use*. But Galen uses for an anti-Aristotelian goal the aim of animal limbs, of which Aristotle availed himself for explaining their structure. For Aristotle, the functions of animal limbs were the best proof of the capability of nature to organize itself without an intelligent mind planning natural order.<sup>24</sup> On the contrary, Galen refers to the functioning of animal parts as evidence of an intelligent architect of nature. Galen closes his work with the famous *Epode*, showing physics and biology to be the best pro-paedeutics for theology. Indeed, according to Galen, the order of nature points everywhere to the presence of an ordering intelligence.

This metaphysical framework explains Galen's requirement of knowing the mechanisms of animal body in order to be able to produce a movement in it. However, the text on the formation of the fetus has its own specificity into the general claim of an intelligent mind in nature. In the *De usu partium*, Galen appeals to an intelligent artificer for biological phenomena with an end – that is, for the functioning of organs in living beings. In *De foetuum formatione*, Galen confirms, as we saw above, the request for an intelligent artificer of animal bodies, due to the complexity of goals performed by each limb, but he goes a step farther, looking for an intelligent and conscious cause of any body movement, voluntary ones included, no matter the goal of that movement. Galen deems the knowledge of *the means* to be a condition of *the efficient causality* of the movement of a limb.

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<sup>24</sup> See M. C. NUSSBAUM, *Aristotle's De Motu Animalium*, text with translation, commentary and interpretative essays, Princeton 1978, pp. 70-74. See also D. QUARANTOTTO, *Causa finale, sostanza, essenza in Aristotele. Saggio sulla struttura dei processi teleologici e sulla funzione del 'telos'*, Napoli 2002, pp. 123-164 and 253 ss.

### 3. *Beside Galen*

If the problem raised in the embryological essay by Galen is at the origin of the principle *Quod nescis* formulated by Geulincx, one wonders what happened of it in the many centuries that elapsed between Galen and Geulincx. This is a pertinent question, because, as we have seen, Galen resorted to the epistemic condition of causality in looking for an intelligent cause of natural order, and the quest for an intelligent cause of natural order is largely present even in those Scholastic philosophers whose investigation of nature was inspired by Aristotle. The most obvious case is Aquinas. Before Aquinas, his teacher, Albert the Great, didn't perceive any difficulty in attributing Aristotle the saying *Opus naturae est opus intelligentiae*.<sup>25</sup> Albert formulates this saying for the first time in *De animalibus*, and precisely in book 16, chapter 7, where Albert summarizes Aristotle's theory about generation and development of embryos.<sup>26</sup> As happened in Galen, embryology is the ideal context for an appeal to an intelligence in explaining natural phenomena.

Not far from Albert is Aquinas. The analysis of nature, by Aquinas, assumes Aristotelian categories, but it leads to divine intelligence, as in Plato. This transformation of Aristotelian physics implied the refusal of the basic claim on which Aristotle centered the autonomy of nature from God, i. e. the claim according to which aiming at a goal, in nature, doesn't imply an intelligent and conscious mind.<sup>27</sup> Typically Aquinas, in his fifth way of proving that God exists, shows that He exists moving from the claim that natural beings with no intelligence act with a goal. Since there are no final causes without conscious understanding, the behaviour of natural beings with no intelligence indicates that there is an intelligent mind directing nature, like the archer aiming his arrow.<sup>28</sup> Natural order

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<sup>25</sup> On the history of this interpretation of Aristotle that dates back to Themistius, see S. LANDUCCI, *I filosofi e Dio*, Roma-Bari 2005, pp. 17 ss.

<sup>26</sup> See J. A. WEISHEIPL, *The Axiom 'Opus naturae est Opus Intelligentiae' and Its Origins*, in *Albertus Magnus doctor universalis. 1280-1980*, ed. by G. MEYER and A. ZIMMERMANN, Mainz 1980, pp. 441-463.

<sup>27</sup> ARISTOTLE, *Physics* II, 8, 199b 26-30: «It is absurd to suppose that purpose is not present because we do not observe the agent deliberating. Art does not deliberate. If the ship-building art were in the wood, it would produce the same results by nature. If, therefore, purpose is present in art, it is present also in nature. The best illustration is a doctor doctoring himself: nature is like that».

<sup>28</sup> THOMAS AQUINAS, *Summa theologiae* I, qu. 2, a. 3, in c.: «Videmus [...] quod aliqua

was therefore traced back to an external agent, risking the reduction of all natural phenomena to instruments, like the arrows in the archer's hands.<sup>29</sup>

Nevertheless, Aquinas' argument is strictly limited to natural beings without intelligence. A human being, endowed with reason, is able to set goals, and hence does not risk being likened to an arrow – at least not by this argument. Admittedly, human actions also risk being removed from human causation in Aquinas; here the loss of causality, for human beings, is due to divine *concursum*.<sup>30</sup> In this case, however, there is no appeal to the need for an intelligent mind, but to a power able to preserve the being of creatures. Instead, the specificity of Galen's question posed in *De foetuum formatione* was its reference, first of all, to intelligent beings conscious of their ignorance of the means by which an effect is produced.

In any case, it did not occur to Aquinas, nor to Albert before him, to appeal to intelligence to account for how it is possible to raise an arm at will. Neither Albert nor Aquinas thought that efficient causality needed knowledge of the means which produce an effect. In any case, neither Albert nor Aquinas could have been urged in this direction by the embryological text by Galen, because they did not have access to Galen's *De foetuum formatione*, which was still to remain inaccessible for centuries. Thanks to Diethard Nickel, author of the critical edition of *De foetuum formatione*, we know that this short text had not been translated into either Persian or Syriac. Hence, when first Arabic and later Latin translations of the Persian and Syriac codices of Galen's work became available in Europe between the twelfth and the fourteenth centuries, the *De foetuum formatione* of course was not included. The first Latin versions of the *De foetuum formatione*, rendering the Greek manuscripts

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que cognitione carent, scilicet corpora naturalia, operantur propter finem [...]. Ea quae non habent cognitionem, non tendunt in finem nisi directa ab aliquo cognoscente et intelligente, sicut sagitta a sagittante. Ergo est aliquid intelligentis, a quo omnes res naturals ordinantur ad finem: et hoc dicimus Deum».

<sup>29</sup> THOMAS AQUINAS, *De veritate* qu. 22, a. 2 ad 9: «in omni dirigente in finem requiritur cognitio finis, natura autem non dirigit in finem sed dirigitur: Deus autem et agens a proposito quodlibet etiam dirigit in finem; et ideo oportet quod habeant finis cognitionem, non autem res naturalis».

<sup>30</sup> See A. J. FREDDOSO, *God's General Concurrence with Secundare Causes: Pitfalls and Prospects*, «American Catholic Philosophical Quarterly», LXVIII, 1994, pp. 131-156, and Id., *God's general Concurrence with Secundare Causes: Why Conservation Is not Enough*, «Philosophical Perspectives», V, 1991, pp. 553-585. On Malebranche and continuous creation see S. LEE, *Necessary Connection and Continuous Creation. Malebranche's Two Arguments for Occasionalism*, «Journal of the History of Philosophy», XLVI, 2008, pp. 538-618.

(presently conserved in Florence, Venice and Paris) are those prepared by the humanists and dating from 1535-1536, on the basis of *editio princeps* of Greek texts (1525).<sup>31</sup> Therefore, it was only at the beginning of the modern era that Galen's text entered the philosophical debate, which it soon influenced. Establishing a link between causality and knowledge of the means by which effects are produced, Galen forced philosophical debate to examine the problem that Geulincx would express in the *Quod nescis* principle.

The same is true of the consequences, which are presumed to be modern too, of the principle formulated by Geulincx in 1663. In fact, following the logic of his reflections on the mysteries of living body movements, Galen also met the converse of *Quod nescis*, i. e. the principle that Vico will call the '*Verum factum*'. According to the *Verum factum* principle, only those who cause an effect have real knowledge of it. The idea this principle expresses appears in Galen's text, in reflecting on the link between causality and knowledge: «This seems to signify that, using these parts, the soul knows their use *as if it itself built them*, and not as if it used them as built by someone else». <sup>32</sup> The supposed modernity of the *Quod nescis* and *Verum factum* principles is due only to the circumstance that Galen's text on the formation of the fetus entered philosophical debate in the middle of the sixteenth century.

Let us draw some first conclusions: the problem raised by Galen in his embryological text is ineffective until the half of the XVI century. The philosophical context at the origin of the problem raised by Galen, i. e. the need of an intelligence for explaining natural order, had produced important consequences before, but they were circumscribed to behavior, supposed aiming at a goal, of non intelligent beings. Human beings, *qua* endowed with intelligence, were excluded by this analysis. In Galen's embryological essay, the epistemic condition of causality concerns mainly human body movements. When Geulincx formulates and Malebranche assumes the principle *Quod nescis*, human actions are the first to need a foreign and intelligent cause, expanding the epistemic condition to any cause-effect relation.

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<sup>31</sup> See D. NICKEL, *Einleitung* to GALENO, *De foetuum formatione*, cit., pp. 38-39.

<sup>32</sup> GALENO, *De foetuum formatione*, cit., p. 96; ed. Kühn, p. 692: «Haec omnia videtur significare, animam, quae partibus his utitur, ipsarum usum cognoscere, *quasi ipsa eas fabricavit, non ab alio fabricatis utatur*».

#### 4. *The Campanella case*

Even if the problem raised by Galen in *De foetuum formatione* enters the philosophical debate only in the half of XVI Century, it is worth asking what happened in the more than one hundred years between the modern edition of the Galenic text and the formulation of the principle *Quod nescis* by Geulincx. If we could verify that the problem raised by Galen, silent before 1535, had some echoes between 1535 and 1663, this will strongly support the hypothesis that the epistemic problem about causality has its origin in Galen's text.

In fact, the problem raised by Galen emerges in a text by Tommaso Campanella, *Del senso delle cose e della magia*, first published in Latin translation in 1620.<sup>33</sup> This text, as its title indicates, is dedicated to claiming on behalf of nature sensibility and a form of knowledge, as opposed to all philosophical doctrines which found nature lacking knowledge and therefore ineffective.

Campanella deems obvious the thesis according to which where there is finality there must be knowledge of the goal. Explicitly disputing Aquinas and scholasticism, Campanella draws the conclusion that nature, whose action aims at a goal, is endowed with sensibility and a form of knowledge: «Nature knows its goal, because it would neither act nor direct its work toward its goal, if it did not know it. Therefore, instinct is the impulse of a knowing nature».<sup>34</sup> Every being knows what is good for its nature and aims at it, as fire aims upwards. Unlike the arrow, nature knows the goal it aims at. Whoever denies this would not be able to distinguish natural from violent movement.

In *Del senso delle cose* Campanella critically cites Galen's text on the formation of the fetus.<sup>35</sup> Campanella cannot agree with Galen, because the

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<sup>33</sup> On the history of Campanella's text see G. ERNST, *Nota al testo*, in T. CAMPANELLA, *Del senso delle cose e della magia*, a cura di G. ERNST, Roma-Bari 2007.

<sup>34</sup> CAMPANELLA, *Del senso delle cose e della magia*, cit., p. 17: «Dunque la natura conosce il fine, perché non ageria né indrizzera a quello l'opere sue, se non lo conoscesse. Dunque l'istinto è impulso di conoscente natura». Campanella deems so evident the link between aiming at a goal and having knowledge of it that he attributes this opinion to Aristotle himself, following the interpretation of Aristotle already pursued by Albert the Great. *Ibid.*

<sup>35</sup> *Ibid.*, I, ch. 3. Galen's work on the fetus is also discussed in STEPHANI RODERCI CASTRENSIS *De Meteoris microcosmi Libri Quatuor*, Florentiae, Apud Iunctas 1621, pp. 4 ss. Roderigo De Castro's text is discussed by M. MERSENNE, *L'impïété des déistes*, éd. par D. DESCOTES, Paris 2005, pp. 607 ss. Moreover, Mersenne, criticizing Campanella's *De sensu rerum*, directly quotes

Greek physician, following Plato, looked for the origin of the complex arrangement of the body not in nature but in a world soul or in an architect of nature. In fact, Campanella includes the author of *De foetuum formatione* in a long list of authors who, in order to explain natural phenomena, resort to an intelligence not pertaining to the essence of nature:

Someone says that angels make these works [...] and Themistius with other Peripatetics resorts to a non wandering intelligence. Alexander and Avicenna seem to say the same as Anaxagoras, and, in *De formatione foetus*, Galen wonders about this mind, and ascribes it the making of animals, as Platonics resort to the world soul. Basil and Augustine agree. A plenty of theologians attribute it to the first Wisdom, who continually acts.<sup>36</sup>

In the list, which includes the text by Galen, appears also the theologian Gabriel Biel with his hard interpretation of divine *concursum*: «the theologian Gabriel holds the same principle (i. e. the acting on nature of a foreign mind) when he says that it is not the sun who shines, but God in the sun; neither is the man who speaks, but God in the man; neither is the fire which moves, but God in the fire».<sup>37</sup> Campanella sees a family resemblance between the questions raised in the embryological text by Galen and the extreme theories of divine *concursum*, which remove any efficacy from natural beings.

In the following chapter, Campanella analyzes a more moderate opinion, which he attributes to Aquinas. According to this opinion, God has endowed beings with a natural instinct, which causes their actions. This opinion could be considered closer to truth, but if this instinct is a movement impressed by God himself and not a power inherent in natural forms and endowed with knowledge, this opinion does not differ from the former one, and, like the former, it reduces natural beings to «tools [...] driven to any action».<sup>38</sup> Campanella suspects that this is Aquinas' case.

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Galen's *De foetuum formatione*. Cfr. M. MERSENNE, *Quaestiones celeberrimae in Genesim*, Lutetiae Parisiorum, Sumptibus Sebastiani Cramoisy 1623, p. 940b.

<sup>36</sup> CAMPANELLA, *Del senso delle cose e della magia*, cit., p. 14: «Altri dicono che queste opere sono fatte dagli angeli [...] e Temistio con altri Peripatetici all'intelligenza non errante corrono. Alessandro e Avicenna par che dicano l'istesso con Anassagora, e Galeno, *De formatione foetus*, s'ammira di questa mente e a lei dona la formazione degli animali, come i Platonici ricorrono all'anima del mondo. E Basilio e Agostino applaudono. Molti teologi alla prima Sapienza, che opera sempre, l'attribuiscono».

<sup>37</sup> *Ibid.*: «Gabriel teologo al medesimo s'appiglia quando dice che non il sole luce, ma Dio nel sole; né l'uomo parla, ma Iddio nell'uomo; né si muove il fuoco, ma Iddio nel fuoco».

<sup>38</sup> *Ibid.*, p. 18: «strumenti [...] ad ogni atto indirizzati».

Against Galen, against the *concursum* theory by Gabriel Biel, but also against the opinion apparently more moderate by Aquinas, Campanella holds that God does not draw nature towards a goal, but gives it the capacity of aiming on its own. Having this ability, nature has also been endowed by God with *knowledge of how to reach the goal* at which it aims: «God [...] does not draw nature towards a goal but endows nature with the ability to reach a goal as well as knowledge of *how to reach it*, otherwise God would be identical to us, because we, unable to give virtue to an arrow, endow it with violence, a violence which lasts very briefly and destroys the arrow». <sup>39</sup> But the weapon used against Galen retorts against Campanella himself. In fact, if Campanella disagrees with Galen in attributing natural beings a knowledge of their goals, he does agree with him and, in general, with the philosophers who resorted to a divine mind for explaining natural order, on the principle that any final cause implies knowledge. Sharing this principle, Campanella, in the second book of *Del senso delle cose*, meets with the problem the *De foetuum formatione* raised, i. e. that the knowledge of *the means* which produce an effect is a condition for causality in living bodies and especially in human ones.

Remembering the strong rejection of scholastic theories of *concursum* and divine direction of natural beings to a goal, the turn in chapter 26 of the second book is amazing, already in the title: *Every thing is and acts as a tool of the first cause*. ‘Tool’ is exactly the word used by Campanella in rejecting Aquinas, who, in his view, reduced creatures to «tools [...] driven to any action». According to Campanella, each being strives for self-conservation, which is «the supreme good of every thing» and this is true for stones as for vegetables and animals. Just when Campanella focuses his attention on animals, he refers to *De usu partium*, where Galen describes the extraordinary complexity of animal body by which each animal is capable of reaching his own conservation. This same complexity imposes to refer to God or to a divine soul who guides animal bodies: «because who doesn’t understand an enterprise, is not able to direct it». <sup>40</sup> Moreover, the complexity of the human body raises another ques-

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<sup>39</sup> Campanella, *Del senso delle cose e della magia*, cit., p. 18: «Dio [...] non tira al fine se non con l’istesse nature, imprimendo virtù, non solo d’andare al fine, *ma di saper andare*, altrimenti saria Dio eguale a noi che, per non poter dar virtù alla saetta, le doniamo violenza che dura pochissimo, e struggemo la saetta» (Emphasis mine).

<sup>40</sup> *Ibid.*, p. 98: «[N]on può reggere un magistero chi non l’intende».



tion: how is it possible that this body is moved by a mind which doesn't know the means that produce the movements?

I am amazed at the ingenuity of the human being, whose soul governs the body without knowing how it does so. In us, there are so many concoctions, separations, aggregations, nutritions, gatherings and we are unable to understand how we do them. Yet we who are souls perform these acts, without knowing how to create a body with such grace, and even after studying so much anatomy we do not understand it [...]. We ignore ourselves the constitution of our body and its management, because we don't know how we move it, whether in the nerves there is a spirit or a faculty from which the movement originate, how we laugh and cry and think, because there are so many open questions concerning all this. As a consequence, we are obliged to say that *someone else guides us in constituting our body*, as someone else guides the animal and vegetable soul, and that each soul is within the body, blind and in the dark, so that it sees neither itself nor its works.<sup>41</sup>

Galen's problem imposes itself dramatically on Campanella, and it breaks the certainties about the autonomy of nature boldly opposed to the same Galen in the first book of *Del senso delle cose*. Knowledge of the goal is not sufficient for attributing a being the capability to act aiming at it, as Campanella argued in the first book. Now Campanella, as Galen, pretends that the knowledge of *the means* which produce an effect is necessary for accounting for that ability. That is why Campanella goes back to the necessity of a divine mind acting in nature. This mind is endowed of the knowledge lacking to the soul of men, animals and vegetables, and natural beings are to be considered its 'tools':

For sure the first Wisdom, the mind supreme of every thing, is eminently inside everything, and everything is in it; not moving, it is fastest, it walks from one end to another, and it does everything as the principal agent, and any other agent is a tool of his.<sup>42</sup>

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<sup>41</sup> *Ibid.*, pp. 98-99: «Io mi stupisco che l'uomo ha tanto ingegno, e l'anima sua regge il corpo, e pur non sa come lo regga. Si fanno in noi tante concozioni, separazioni, aggregazioni, nutrizioni, assembramenti, e non potemo intendere come le facciamo. E pure noi che siamo anima facciamo questi atti, né possiamo saper fabbricare un corpo di questo garbo, e con mirar tante anatomie manco l'intendiamo.

Ora se noi ignoriamo noi stessi e la fabbrica del corpo nostro e il reggimento, perché non sappiamo come lo moviamo, se va tra nervi lo spirito o facoltà, donde nasca il moto, come ridemo e piangemo e pensiamo, poiché tante questioni si fanno di questo, dunque *resta a dire che altro guidi noi a fabbricare il corpo*, e così l'anima de' bruti e dele piante *da altri è guidata*, e che ogni anima stia in corpo come cieca e all'oscuro, sì che non vede se stessa né le sue opere» (Emphasis mine).

<sup>42</sup> *Ibid.*, p. 99: «Senza dubbio la prima sapienza, mente altissima d'ogni cosa, per eminenza è

Campanella could ascribe knowledge of their goals, and may be also of the means for reaching it,<sup>43</sup> to falling stones and upward-aiming fire, merely stressing their aiming at a goal. But the case of human body' movements is harder because human soul knows that it does not know what is required to perform the movements of its body and to reach its goals: «I am amazed at the ingenuity of the human being, whose soul governs the body *without knowing how it does so*». That is why, reflecting on the problem raised by Galen, Campanella surprisingly accepts the conclusions he disliked so much when argued by Aquinas or Biel: «[first wisdom] does everything as the principal agent, and any other agent is a tool of his», being satisfied with the immanence of divine wisdom. And Campanella, the bravest defender of the autonomy of nature as opposed to divine interference, here quotes the Scriptures on behalf of divine causality in nature: «Wisely, Saint Jerome ascribes to God the creation of a human being in the womb, and thus the Maccabean woman says to her children, “I know neither how to make human beings, nor how you turned up in my womb”, because surely it is the first, universal cause, and not a particular one, that more certainly has effect».<sup>44</sup> Body's movements and embryology are linked together once more, in focusing the problem originally raised by Galen. Malebranche would later use the same scriptural quote to argue for Occasionalism, against the power attributed to nature, this dangerous idol «of Aristotle and the Peripatetic school», and, we may add, of Campanella himself.<sup>45</sup> This amazing alliance is the consequence of the shared principle following which an intelligence is at work in any natural event.

### 5. *Pierre Chanut and animal instinct*

In 1643, about twenty years before the publication of Geulincx's *Ethica*, Pierre Chanut, a physician, published his *Considérations sur la Sagesse*

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dentro a tutte le cose, e tutte le cose sono in lei; e senza moversi è velocissima, camina da fine a fine del tutto, e ogni cosa opera come principale agente, e ogni agente è suo in strumento [...]».

<sup>43</sup> *Ibid.*, p. 18: «Dio [...] non tira al fine se non con l'istesse nature, imprimendo virtù, non solo d'andare al fine, *ma di saper andare* [...]» (Emphasis mine).

<sup>44</sup> *Ibid.*, p. 100: «Dunque saviamente san Gieronimo attribuisce a Dio la composizione dell'uomo nell'utero, e così quella donna maccabea disse. “Io non so lavorare uomini, né come nel mio ventre siante comparsi” (2 *Macc* 7, 22), parlando ai figliuoli, perché invero alla causa universale e principale con più certezza convien l'effetto che alla particolare».

<sup>45</sup> MALEBRANCHE, *Eclaircissement* XV, cit., p. 239: «Elle ne dit pas comme Aristote et l'Ecole des Peripatéticiens, que c'est à elle et au soleil qu'ils doivent leur naissance, mais au Créateur de l'Univers».

*de Charron* in Paris. Chanet's target is in the pages Charron dedicates to animal intelligence, following Montaigne. Against Charron, Chanet argues that animal instinct does not indicate a form of intelligence in the animal itself. But Chanet does not at all deny that instinctive animal actions show intelligence. On the contrary, the very perfection of instinctive actions, never uncertain, independent of training and experience, shows that their performance requires much more intelligence than what an animal can have. It is necessary to deny reason to animals because their actions show too much of it. Certainly, instinctive actions have an aim, as Aquinas understood, and any aim is backed by an intelligent and conscious design; but all of nature, including animals, is without that intelligence and is therefore an unconscious tool, ignorant of the goal it aims at, like the arrow the archer shoots. To deprive animals of reason, Chanet resorted to Aquinas' arrow:

order is an outcome of reason [...]. Therefore this reason, which does not exist in insensitive beings, must be provided from some other source, and these beings must be led by some other, nobler principle, which knows their goal and knows how to pursue it. Those beings behave like an arrow, which never falls short of its target. Since the arrow heads confidently towards its target, as if it saw it, we are forced to believe it is carried and driven by someone who sees the target and knows how to lead the arrow there.<sup>46</sup>

As a consequence, in instinctive goal-directed actions God is the only cause: «in instinctive actions the first cause alone acts in what concerns driving and directing other causes to their goal».<sup>47</sup>

However, Chanet includes in the category of instinct not only animal's actions but all body movements and all actions that look as demanding a knowledge that the presumed agent does not possess. As a result, actions of human beings too lose their specificity. Indeed, fetus' formation in the womb of the mother, as moving a hand at will, are included in the category of 'instinct'.<sup>48</sup> In this case, to the arrow shot at its target by someone else, Chanet adds something which was not in Aquinas, but which, in tune with the request for an intelligent mind guiding nature, came to Chanet, the physician, from his colleague Galen: one who does not know

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<sup>46</sup> P. CHANET, *Considérations sur la Sagesse de Charron en deux parties*, Paris, C. Le Groult 1643, p. 74.

<sup>47</sup> *Ibid.*, pp. 62-63.

<sup>48</sup> *Ibid.*, pp. 66 and 84.

*how* an effect is produced cannot cause it; hence, when an effect is produced without knowledge of how to produce it, the agent is not the one who seems to be its proximal cause. Human voluntary actions, then, also require an external agent:

Certainly, we move our hands thanks to our imagination, which stirs and drives the faculty to move which is in all muscles. But these muscles are so numerous, and their arrangement so intricate, that, in most cases, the most clever anatomists have difficulty discerning which muscles perform each particular movement, and they often make mistakes, notwithstanding their scrupulousness. Yet, the most ignorant people, those who have never heard talk of muscles or nerves and who do not know that either of them exist, nonetheless do not refrain from any particular movement or from making all their muscles act. Hence, I would ask the foes of instinct where such confident behavior derives from in this faculty which the schools call 'locomotive' [...]. Someone will reply that it is nature which directs it. But that is the reply of the ignorant, who speaks of nature in general, without pointing to any specific faculty [...]. Our soul can know and discern the muscles only through the senses or reason. Since the soul of men who have not learned anatomy is not acquainted with them neither by senses nor by reason, it is evident that it doesn't know them at all. *Not knowing nor discerning them at all, it is necessary that it is guided by another power who knows them, and this is what we call instinct.*<sup>49</sup>

Clearly, Chanet partakes of the line of thought which Galen started, even echoing Galen's contempt towards those who refer to 'nature' to account for instinctive movements. Notably, Chanet interlaces the argument according to which any goal-oriented behavior needs an intelligent cause and the epistemic condition for causality. As Galen and Campanella before him, Chanet is an excellent witness of the common conceptual origin of these arguments that resort to God for explaining natural events. Moreover, by Chanet, the argument originating in Aquinas according to which any goal-oriented behavior requires an intelligent cause strikes out mainly at the causal capacity of animals, beings allegedly not intelligent, whereas the resumption of the epistemic condition for causality strikes a blow above all at human actions. Indeed, men know better their own faculties than animal's ones. Moreover, the human soul knows that it does not know what is required to perform the movements of his body. That is why the argument that will be referred to as *Quod nescis* has its first

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<sup>49</sup> *Ibid.*, pp. 64-66 (Emphasis mine).

and preferred application to human behavior, overcoming the eventual pretence that nature and animals could know the means by which their actions are performed.<sup>50</sup> A pretence that Campanella, as we have seen, was inclined to advance.<sup>51</sup>

A comparison between this text of Chanut's and Malebranche's *Search after truth*, quoted above,<sup>52</sup> leads to suspect, furthermore, that Chanut's text, rather than Geulincx, may have been the proximal source of Malebranche's assumption of the *Quod nescis* principle.<sup>53</sup>

## 6. Occasionalism against Descartes

Now we can ask ourselves about Descartes' position regarding the problem set by Galen. Descartes is the philosopher who identifies the essence of the Self with thought, and thought with consciousness; hence Galen's argument concerns him more than anyone else. How is it possible to ascribe to the conscious mind causation of body phenomena which the mind does not know how to produce? Arnauld raises the point: «This is what I have understood from your principles: only that which we consciously experience as thought is the work of the mind, which is by nature thought. But if animal spirits in the nerves flow this or that way, this happens without thought or awareness, and therefore it seems that it

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<sup>50</sup> *Ibid.*, pp. 66-68: «De fait il n'y a point d'homme si brutal, qui ayant veu les enfans nais sans approchans du sein de leurs nourrices, n'ait admiré l'instinct, qui leur ouvre la bouche, et leur fait apres reserrer pour succer le lait, avec tant d'artifice, qu'il y a des hommes faits qui s'y trouveroient bien empeschez. [...] Il faut avoir l'esprit mal fait pour ne reconnoistre pas, que ce n'est pas une connoissance qui leur soit propre, qui les porte à cela, et qu'il faut qu'ils y soient conduits par une plus grande sagesse que la leur. [...] Quelqu'un dira que les bestes qui viennent de naistre sont autant à admirer. Ce que j'avoue estre veritable, et c'est un de nos argumens pour l'instinct; mais il n'est pas si evident que celui que nous tirons de l'alaitement des enfans, pource que nous connoissons mieux l'estat et les facultez de l'ame d'un enfant, que nous ne faisons celles des bestes. *Nous sçavons bien que nous venons au monde sans y apporter aucune connoissance*, que les sens ne nous en ont encore point fourny, et que nous ne nous servons pas de nostre raison. *Au lieu que nos Adversaires seroient bien assez bardis pour nous assurer que les bestes raisonnent dès leur naissance*» (Emphasis mine).

<sup>51</sup> See *supra*, note 43.

<sup>52</sup> *Supra*, p. 000.

<sup>53</sup> The library of Malebranche contained two texts by Marin Cureau de La Chambre, who was engaged in a long dispute with Pierre Chanut about the knowledge of animals. Cfr. MALEBRANCHE, *OC*, XX, pp. 260-261. Moreover, Chanut was a philosopher well known in Cartesian circles. La Forge quotes Chanut's *Traité de l'Esprit de l'Homme et de ses fonctions* in his *Traité de l'esprit de l'homme*, cit., p. 153 and *passim*.

cannot be the product of the mind». <sup>54</sup> Arnauld deems the Cartesian identification of thought with consciousness to be one more problem in the interaction between mind and body, in the spirit of the questions posed by Galen; if mind and consciousness are identical, if the mind does not know how animal spirits flow in the nerves, the mind cannot make the animal spirits move.

Descartes replies the following: «True, we are not aware of how our mind makes animal spirits flow in these nerves or in those others [...]. Nevertheless, we are aware of any action by which the mind makes the nerves move, because this action is in the mind: in the mind this action is, in fact, a proclivity of the will towards this or that movement. The flowing of spirit in the nerves and everything that is required to produce that movement are a consequence of this proclivity of the will, and this is because of the apt arrangement of the body, *which the mind may not know*, and also because of the union of mind and body, of which the mind is certainly aware». <sup>55</sup> That is, Descartes explicitly denies that knowledge of how our body movements are produced is necessary to ascribe their causation to the mind. The causality of the mind depends on the will: the ways in which the body satisfies its commands are determined by body structure, of which the mind, without losing efficacy, has no knowledge.

Descartes' position is not surprising, since his whole physical and metaphysical project opposes the metaphysical framework within which Galen's question can be posed. As everybody knows, Descartes' explanation of how the world is formed is meant as a break with the Renaissance view of the divinity of nature: «Here, by nature I do not mean a

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<sup>54</sup> Arnauld to Descartes, July 1648, in R. DESCARTES, *Oeuvres*, éd. par CH. ADAM et P. TANNERY (AT), V: *Correspondance. Mai 1647 - février 1650*, Paris 1974, p. 215: «Uno verbo, quantum ex tuis principiis colligere potui, id solum fit à mente nostra, quae natura sua cogitatio est, quod fit cogitantibus atque advertentibus nobis; at quod spiritus animales hoc vel illo modo in nervos dirigantur, id non fit cogitantibus atque advertentibus nobis: non ergo à mente nostra fieri videtur».

<sup>55</sup> Descartes to Arnauld, 29 July 1648, in AT, V, pp. 221-222: «Verum autem est, nos non esse conscios illius modi, quo mens nostra spiritus animales in hos vel illos nervos immittit [...] sumus tamen conscii omnis eius actionis per quam mens nervos movet, quatenus talis actio est in mente, quippe in qua nihil aliud est, quam inclinatio voluntatis ad hunc vel illum motum; atque hanc voluntatis inclinationem sequuntur spirituum in nervos influxus, et reliqua, quae ad istum motum requiruntur; hocque propter aptam corporis configurationem, *quam mens potest ignorare*, ac etiam propter mentis cum corpore unionem, cuius sane mens conscia est; alioquin enim ad membra movenda voluntatem suam non inclinaret» (Emphasis mine). See D. KOLESNIK-ANTOINE, *Les occasionalismes en France à l'âge classique. Le 'cas' arnaldien*, «Revue de métaphysique et de morale», XLIX, \*\*\*\*, pp. 41-54, and EAD., *L'homme cartésien*, Rennes 2009, pp. 239-267.

divinity, or any other kind of imaginary power. I use the term for matter itself». <sup>56</sup> Against Renaissance vitalism, Descartes certainly did not intend to go back to the role ascribed to God by the Platonized Aristotelianism of the Schoolmen. Descartes goes beyond the alternative which dominated the philosophy of nature in accounting for world order. This order is produced by efficient causes and by the laws of body movements; final causes have no role in his explanation of physics. <sup>57</sup> With the absence of teleology the demand for an intelligence able to account for regular natural phenomena also disappears. Nature is the set of particular and different movements which occur because of the colliding of bodies unintended by God. <sup>58</sup> Mechanical arrangements of its parts, as *De homine* tries to demonstrate, explain human body's functions, too. Descartes' tale of the world and his biological researches develop in opposition to both the divinity of nature and to a plan of divine intelligence, by-passing the alternatives of the schoolmen's Platonized Aristotelianism and Renaissance divine nature. The *Quod nescis* principle, instead, sprang from and grew on the problematic grounds Descartes wanted to leave behind. <sup>59</sup> That Descartes was wholly alien to the problems posed by Galen is confirmed in his philosophical discussion on animal behavior, which Descartes had touched on already in his *Discourse on Method*, maintaining, as is well known, that animals have no sensibility. <sup>60</sup>

Among the many notable elements in Chanut's work there is an absence, a void. Chanut never mentions Descartes, simply ignoring him, giving neither a hint nor a single quote. Still, Descartes himself, in his

<sup>56</sup> R. DESCARTES, *Le monde*, in AT, XI, pp. 36-37.

<sup>57</sup> R. DESCARTES, *Meditationes de prima philosophia*, in AT, VII, pp. 55<sup>23-26</sup>.

<sup>58</sup> R. DESCARTES, *Le Monde*, in AT, XI, p. 37<sup>7-12</sup>.

<sup>59</sup> I do not know whether the anonymous critic of Darwin was conscious of quoting and reversing the *Quod nescis* principle when he wrote, in 1868: «In the theory with which we have to deal, Absolute Ignorance is the artificer; so that we may enunciate as the fundamental principle of the whole system, that *in order to make a perfect and beautiful machine it is not requisite to know how to make it*». Cfr. [M. R. BEVERLY], *The Darwinian Theory of the Transmutation of Species Examined by a Graduate of the University of Cambridge*, London, James Nisbet & Co, 1867, p. 295. Darwin certainly comes at the end of a process of explaining the order of nature without intelligent design in which Descartes has an important place. Daniel C. Dennett quotes the passage by the above mentioned critic of Darwin in *Atheism and Evolution*, in *The Cambridge Companion to Atheism*, ed. by M. MARTIN, Cambridge 2007, pp. 135-148. Surprisingly, Dennett ranks Descartes among the philosophers who argue proof of God's existence «from design».

<sup>60</sup> For a critical review of the literature on this Cartesian topics see M. T. MARCIALIS, *Sensibilità e automatismo negli animali-macchina cartesiani*, «Rivista di storia della filosofia», LXVI, 2011, pp. 603-631.

*Discourse on the Method*, presents his view of animal-machines as a good antidote against Montaigne. Descartes and Chanet have the same enemy, libertine thought, which made animal intelligence central to an anti-Christian strategy. But sharing an enemy does not make for an alliance. Descartes and Chanet fear two very different aspects of Montaigne's and Charron's libertine thought: Descartes' concern is that the animal intelligence thesis might cast doubt on the immortality of the human soul; Chanet fears that this thesis might make nature autonomous in relation to God's actions. Consequently, their strategies in opposing libertine thought are radically different. Descartes deprives animals of sensibility, and hence of a soul, and as a consequence their mortality is not an argument to doubt the immortality of the human soul. Instead, Chanet has no problem in letting animals have sensibility, but aims at bringing entirely back to God the causation of instinctive actions, both animal and human. According to Chanet, animal instinct is an episode in the struggle between nature and God, whereas according to Descartes animal instinct is critical only in relation to the question of animals having an incorporeal mind.

The debate on animal behavior offers a further argument to measure how extraneous the *Quod nescis* principle was to the Cartesian vision. Descartes aims to deprive animals of sensibility, and hence of any form of conscious thinking, even the most elementary, such as feeling cold or hunger. Descartes' argument rests on the thesis that movements in animal bodies can be produced *independently* of any sensibility or intelligence, exactly like in machines. That is, the animal-machine theory is possible only if the *Quod nescis* principle does not hold. Chanet's thesis according to which instinctive animal and human actions are God's work rests on the claim that all body movements require intelligence, i. e. on the claim that the principle holds.

In conclusion, Geulincx has merged an alien element into Cartesianism, arising from a set of ideas against which Descartes had built his physics and his biology. We should not forget that Geulincx was first of all an Augustinian and hence a Platonist.

On the other hand, the Platonic line in physics which Galen started could have undergone a further check by Descartes himself. At least, this must have been what Clerselier felt or planned for when, having in his hands Descartes' manuscript entitled *La Description du Corps humain*, he decided to add a second title: *De la formation du foetus*.<sup>61</sup> Perhaps,

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<sup>61</sup> See the critical note by Charles Adam in AT, XI, pp. 219-222. The title may have been inspired by the 'digression' added by Descartes to *La Description du Corps humain*. But the



Clerselier was aware that the biology and the references to embryology that Descartes had left unfinished offered the best answer to the questions posed by Galen's text on the formation of the fetus, obstructing the animistic and theological approaches which that text had suggested.<sup>62</sup> For sure, Galen much more than Aristotle could have been the target of the following remark:

The soul can excite a movement in the body only if the limbs required for this movement are well disposed. Instead, when all limbs are well disposed for any movement, *the body doesn't need the soul for producing it*.<sup>63</sup>

If Clerselier's, in choosing a title of the unfinished Cartesian's work, aimed at emphasizing the opposition of Cartesian biology to Galen's embryological essay, the sequel to the story of Cartesianism would have bitterly disappointed him.

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title given by Descartes to this digression would have been *De la Formation de l'animal*. *Ibid.*, p. 219.

<sup>62</sup> In the second paragraph, in the *Description du Corps humain*, Descartes claims that ignorance of anatomy and of body's mechanic complexity concurred to fuel the bias according to which only a soul would explain body's complex movements. As we know, in the treatise on the foetus formation, Galen ascribed to ignorance of anatomy and of body's mechanic complexity that physiologists hadn't previously searched for the intellectual principle presiding over body functions. Descartes' text should have looked to Clerselier a downright retort to Galen's argument. See AT, XI, p. 224: «Mais pource que nous avons tous éprouvé, dès nostre enfance, que plusieurs de ses mouvemens obéissoient à la volonté, qui est une des puissances de l'ame, cela nous a disposez à croire que l'ame est le principe de tous. A quoy aussi a beaucoup contribué l'ignorance de l'Anatomie et des Mechaniques: car ne considerans rien que l'exterieur du corps humain, nous n'avons point imaginé qu'il eust en soy assez d'organes, ou de ressorts, pour se mouvoir de soy-mesme, en autant de diverses façons que nous voyons qu'il se meut».

<sup>63</sup> *Ibid.*, p. 224 (Emphasis mine).