



**HAL**  
open science

## Is De Motu an occasionalist treatise?

Claire Schwartz

► **To cite this version:**

Claire Schwartz. Is De Motu an occasionalist treatise?. De Motu: Text, Context and Perspectives, P. Taranto, Oct 2022, Aix en Provence, France. <hal-04383434>

**HAL Id: hal-04383434**

**<https://hal.science/hal-04383434v1>**

Submitted on 11 Jan 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

## Is *De Motu* an occasionalist treatise?

Much already has been said about the *De Motu*, and especially as a discussion of Newton's theories. It is also known for Popper's interpretation of this text singling out its originality, and as an anticipation of the instrumentalist or phenomenalist epistemology of modern physicians like Mach. But when we read the text, without considering Berkeley's other works, it could read as a Cartesian treatise, as it has been argued by G. Brykman some time ago, and as such is often related to the circumstances of the text's composition<sup>1</sup>. If that it is the case, it would mean that only an external reading of the *De Motu* could give scope for the Popper interpretation. But it could be worth expanding on this topic and attempt to examine more precisely whether the propositions of the *De Motu* are indiscernible from a certain kind of occasionalism that was rather implicit in Cartesian texts on bodies and natural philosophy and made explicit by Malebranche.

### I. ARE THE MAIN PROPOSITIONS OF DE DE MOTU OCCASIONALIST?

#### 1. Situation

There is a contingent reason explaining the Cartesian aspect of Berkeley's account of physical science in *De Motu*. We know that this text was written in the context of a prize offered by the Paris Académie royale des sciences on the subject « cause of motion », although we do not know for certain whether the text was ever submitted to the Académie. We might infer from this circumstance that Berkeley wanted to adapt his ideas to the French intellectual and scientific landscape where the figures of Descartes and Malebranche, especially after 1699 when the latter and some of his friends became members of the Académie, were leading authorities, with a certain curiosity for Newtonian publications nonetheless.

Consequently, we don't immediately recognize the author of the *Principles of human knowledge* or of the *Dialogues* in the *De Motu*, to the extent that, without any context, one could think that it been written by a Cartesian or Malebranchian philosopher, apart probably from its detailed criticism of Newtonian absolute space. It is also true, however, that the epistemological propositions found in this short text do not contradict, *prima facie*, the conclusions of the *Principles*. Some metaphysical hypotheses are just conspicuously absent, particularly the immaterialism. Does it mean they don't have any relevance to his conception of physical science?

#### 2. The “main propositions of the De Motu”

According to Popper, there are 21 propositions we can attribute to Berkeley in the field of philosophy of physics, which, according to him, “have a strikingly new look<sup>2</sup>”. Here's a shorter list of these propositions:

---

<sup>1</sup> G. Brykman, « Le Cartésianisme dans le *De Motu* », *Revue Internationale de philosophie*, vol. 33, n°129, 1979, p. 552-569 ; see also: Lise Downing, « Berkeley's philosophy of science », *The Cambridge Companion to Berkeley*, CUP, p. 230-265. More recently, M. Atherton claimed that in the *De Motu*, “Berkeley goes out if his way to ignore his idealism”: “Berkeley's philosophy of science”, *Oxford Handbook of Berkeley*, S. Rickless (éd.), OUP, p. 237.

<sup>2</sup> « A Note on Berkeley as precursor of Mach », in *The British Journal for the Philosophy of science*, vol. IV, n°13, 1953.

- a. critique of some misused terms in physics: force, and its derivatives: attraction, gravitation. The Newtonian concepts of absolute time, space and motion are a particular case of terms lacking true meaning being used in physics
- b. explanation in physics is not a causal explanation: it doesn't give insight into the true and hidden causes of physical phenomena
- c. the reason is that there are no occult qualities in things
- d. there are laws of nature and they are the objects of the scientists
- e. explanation in physics relies on mathematical hypotheses whose validity depends on their conformity with phenomena
- f. these hypotheses are not true but efficient
- g. the same phenomena can be explained by different mathematical hypotheses
- h. there is nothing in reality corresponding to these mathematical hypotheses
- i. there is nothing physical behind the physical bodies, their appearance is their reality

Now, not all these propositions, which constitute a reconstruction of Berkeley's philosophy of science, are expressed in *De Motu*. The ones that can be found could be compared, and often identified to, Malebranchean propositions on bodies, motion and explanations of phenomena.

### 3. Force in bodies as an occult quality

Some of Popper's propositions are related to the first paragraphs of the *De Motu* where Berkeley explains that force is an occult quality that cannot be attributed to bodies. What we actually perceive are their motions, and not their cause. We do not know what we are talking about when we talk about force like gravity, attraction, etc., as the cause of these motions; they could be anything, and consequently, could explain anything, which is the same as not explaining anything:

« It is therefore obvious that gravity or force are taken in vain as the principle of motion : for how can this principle be more clearly known by being called an occult quality ? What itself is occult explains nothing. And let us overlook the fact that this unknown active cause would be better called a substance than a quality. Moreover, « force », « gravity », and words of this sort are more often (and not improperly) taken into concrete, so as to mean the body moved, the difficulty of resisting, etc. Yet when they are used by philosophers to signify certain natures prescinded and abstracted from all these things, which neither are the object of the senses nor can be framed by any force of the intellect or the imagination, then indeed they produce errors and confusion<sup>3</sup>. »

In this case, words do not denote anything real, as it is always the case with general abstract ideas.

Is this proposition necessarily dependant on a sensualist theory of ideas? Not in the way it is presented in *De Motu* since Malebranche follows a similar reasoning on many occasions, but especially in the Book VI of the *Recherche de la verité*, in the chapter that comes just before the one demonstrating his occasionalist theory:

« The other type of equivocal terms used by philosophers includes all these general terms of logic with which it is easy to explain all things without having the slightest knowledge of them. Aristotle is the one who used them the most: all his books are full of them, and there are some that are only pure logic. He presents and resolves all things through the use of these lovely words: *genus, species, act, potency, nature, form, faculties, qualities, cause in itself*, and *accidental cause*. His followers have trouble understanding that these words signify

---

<sup>3</sup> *De Motu and The Analyst (DM)*, trad. D. Jesseph, Springer, 1992, §6.

nothing, and that they are no more learned than before just because they are heard to say that fire dissolves metals because it has a dissolving faculty; and that man does not digest because he has a weak stomach or because his digestive faculty is not performing its functions well<sup>4</sup>.

»

According to Malebranche, the Aristotelian metaphysics is only an elaboration of immediate sensory experience which is reflected in ordinary language. It leads to attributing to bodies qualities that they do not possess, such as color, softness, warmth, etc. As a Cartesian, Malebranche insists that these latter qualities exist only in the soul which perceives them.

We then come to the heart of the problem for Malebranche: we perceive that bodies have a certain effect on us (perception of color, texture, heat, etc.) and on one another (fire dissolves metals, magnet attracts bodies, etc.), and so we attribute to these same bodies the ability to produce these effects by virtue of some immaterial, *imperceptible* form. These terms faculty, form, etc., are vague and abstract terms which attempt to explain what is perceived by some unobservable power in bodies and that causes it.

For instance, we spontaneously attribute to fire the power to dissolve metals, simply because *we have seen* that fire, in the presence of metals, dissolves them. But we do not perceive this faculty, an obscure term, which would make such a phenomenon possible. Far from explaining the physical phenomenon of dissolution, the attribution of a power to fire prevents us from understanding and examining it adequately, that is, mechanically.

The reification of inexistent bodies' unextended and imperceptible powers for both Malebranche and Berkeley comes from an extrapolation of our perceptive experience consolidated by the use of general terms. We obviously note a difference in their approach though: Malebranche insists on the qualitative aspect of the physics of substantial forms producing a confusion between thinking substance and material substance; his criticism therefore implies the affirmation of *material substances* distinct from the ideas constituting the modes of a soul. But immaterialism being absent from *De Motu*, and Malebranche arriving at the same conclusions on forces as occult qualities, their demonstration on this point has to be considered as almost indiscernible.

#### 4. On the real cause of motion

That the ordinary notion of the force in bodies is empty and illusory still does not tell anything about the true cause of motions. That Berkeley shares with Malebranche the critique of this ordinary notion does not therefore mean that he shares his occasionalist philosophy. Let us now consider what *De Motu* positively says on this subject:

- There are only two types of things, bodies and souls: §21.
- Bodies are by nature passive, so they cannot in essence be the cause of their motions: §22-26<sup>5</sup>. Nothing in their nature contains such power. The body is a notion which, when

---

<sup>4</sup> Malebranche, *La Recherche de la vérité (RV)*, Livre VI, II, chap. 2, p. 443, trad. T.M. Lennon & P.J. Olscamp, CUP, 1980.

<sup>5</sup> «§21. (...) There are two supreme classes of things, body and mind. We know by sense something extended, solid, mobile, figured, and endowed with other qualities which meet the senses; but we know by a certain internal consciousness the sentient, percipient, intelligent thing. Further, we discern that these things plainly differ from one another and are widely heterogeneous. I speak of things known, for it is useless to speak of things unknown. §22. All that which we know and have given the name 'body' contains nothing in itself which could be the principle or efficient cause of motion; for indeed impenetrability, extension, and figure include or connote no power of producing motion. On the contrary, reviewing singly not only these but any other qualities of body, whatever they

it is purified of the metaphors attached to it, does not contain anything which is not clearly thought out by the mind.

- There is an active thing that we experience to be the principle of motion, called soul, intelligence or spirit: §30.
- The principle of inertia asserts that a body remains in the same state of motion or rest in the absence of any external force, therefore there is no difference at any moment between the cause of the motion of a body and the cause of its existence. Its existence being posited, its motion or rest is entirely so: §34.
- God is the cause of the successive existence of the same body at each moment, he is therefore the cause of their movement: §36<sup>6</sup>.
- This is the conclusion to which Newton himself came to: §26.

We therefore have a series of propositions claiming the intrinsic passivity of bodies, as opposed to the active nature of spirits, and which leads to identify the cause of the motions of natural bodies with God, creator of bodies and of all things. Let us compare these propositions with Malebranchist statements on these same subjects.

We have previously mentioned the fact that Malebranche, following Descartes, assumes the existence of material substances, a proposition totally opposed to Berkeleyan principles. We now notice that Berkeley introduces here a dualism very close to the Cartesian one: he does not oppose minds and ideas but thinking things and extended things (*DM*, §30). Granted, Berkeley does not assert that bodies are *essentially* extended things, but the paragraph §29 implies it. He concludes from this that bodies are essentially passive. The intrinsic passivity of bodies is obviously a central component of Malebranche metaphysics and on which his physical occasionalism is based. If bodies are essentially extended things, then they cannot be the cause of motions, their own or of other bodies. The first two Berkeleyan propositions concerning the passivity of bodies as extended things are found in Malebranche, as they could have been in Descartes.

Does Malebranche claim that we experience our soul to be an active thing which is the cause of motion? On this point, it seems that the two authors diverge, explaining Berkeley's explicit rejection of Malebranche's occasionalism. For Malebranche indeed, it is not simply bodies, but every natural, that is to say finite, substance that cannot be cause by itself:

« It is clear that no body, large or small, has the power to move itself. A mountain, a house, a rock, a grain of sand, in short, the tiniest or largest body conceivable does not have the power to move itself. We have only two sorts of ideas, ideas of minds and ideas of bodies; and as we should speak only of what we conceive, we should only reason according to these two kinds of ideas. Thus, since the idea we have of all bodies makes us aware that they cannot move themselves, it must be concluded that it is minds which move them. But when we

---

might be, we will see that they are all in fact passive and there is nothing active in them which could in any way be understood as the source and principle of motion. », *DM*, *op. cit.*, p. 82-83.

<sup>6</sup> « §36. It will be of great importance to have considered what a principle properly is and in what sense this word is to be understood by philosophers. Now the true, efficient, and conserving cause of all things is most rightly called their source and principle. But the principles of experimental philosophy are properly called the foundations upon which rests, or the sources from which derives (I say not the existence, but) our knowledge of corporeal things, and these foundations are sense and experience.

Similarly, in the mechanical philosophy, those things are to be called principles in which the whole discipline is founded and contained: those primary laws of motion which are proved by experiments, refined by reason, and rendered universal. These laws of motion are appropriately called principles, since from them derive both general mechanical theorems as well as particular explanations of the phenomena. », *ibid.*, p. 89.

examine our idea of all finite minds, we do not see any necessary connection between their will and the motion of any body whatsoever. On the contrary we see that there is none and that there can be none. We must therefore also conclude, if we wish to reason according to our lights, that there is absolutely no mind created that can move a body as a true or principal cause, just as it has been said that no body could move itself<sup>7</sup>. »

The experience of the will is only that of a *correlation* between our volitions and the motions which follow. Although this is not the place to discuss it in detail, one could argue that the occasionalism of the minds matters less to Malebranche than the physical occasionalism concerning bodies which has major moral and theological consequences, while the psychic occasionalism simply solves the problem of the causal interaction stated by Descartes between the soul and the body. Moreover, Malebranche indicates in other texts that the will has the power to *initiate causal processes*. He views the principle of inertia as a perfect model of the human will – in the absence of any external disturbance, it is like a motion in a straight line, perpetually oriented towards "the possession of good and truth":

« For a proper understanding of this, it must be realized that there is a very significant difference between the impression or motion that the Author of nature produces in matter, and the impression or impulse [*mouvement*] toward the good in general that the same Author of nature continuously impresses in the mind. For matter is altogether without action; it has no force to arrest its motion or to direct it and turn it in one direction rather than another. Its motion, as has just been said, always proceeds in a straight line; and when it is impeded from continuing in this way, it describes the greatest possible circular path and consequently most approximates a straight line, because God impresses its motion on it and controls its direction. But such is not the case with the will, which in a sense can be said to be active, because our soul can direct in various ways the inclination or impression that God gives it. For although it cannot arrest this impression, it can in a sense turn it in the direction that pleases it, and thus cause all the disorder found in its inclinations, and all the miseries that are the certain and necessary results of sin<sup>8</sup>. »

But the text also introduces the fundamental limit of the analogy: the mind also has a power called freedom, which allows, not to cause a movement, but to divert it, something the extended body is incapable of. Psychic occasionalism simply indicates that human will cannot *only by itself* cause positive motions but it can initiate a change in them.

This leads us to the principle of inertia. Berkeley does not interpret it like Leibniz as resistance to change, but as a consequence of the absolute inefficiency of bodies. He therefore rejects the notion of dead force (*DM*, §10), which is one of those metaphorical expressions incompatible with the clear notion of bodies, and he therefore explicitly attacks Leibniz (*DM*, §8).

Similarly, Malebranche sees in the principle of inertia the confirmation of the absolute passivity and inefficiency of bodies: he interprets it as stating that the movement of a body is not determined from the inside but from the outside by its initial impulsion and by any obstacle it encounters. There is no internal tendency of bodies to pass from rest to motion, from motion to rest, or to modify their motion.

However, the principle of inertia here confirms the inefficiency of bodies but does not prove it. But for Berkeley, the principle of inertia admitted by physicians seems to bring an additional argument to the unreality of bodily force: it implies that the cause of movement is the same as the cause of existence of bodies. And it is obvious that bodies do not give

---

<sup>7</sup> *RV*, VI, II, chap. 3, op. cit., p. 448.

<sup>8</sup> *RV*, I, chap. 1, ii, op. cit., p. 4.

themselves their own existence. The “first philosophy” proves that this cause can only be God who is supremely good. Now, the first premise of Berkeley's reasoning concerning inertia is itself based on the principle that to persevere in one's state is to do nothing except to continue to exist (*DM*, §27).

There is some debate among commentators on Descartes whether this was precisely his position on the cause of the movement of bodies when questioning his ontology of forces: according to M. Gueroult <sup>9</sup>, when Descartes talked about physical forces, they are identified with the tendency of a body to preserve itself in its present state, a tendency grounded in God who preserves the Creation and gives rise to its duration. Force is therefore in things themselves, by virtue of the act of continuous creation and grounded in God<sup>10</sup>. D. Garber found this interpretation ingenious, but nevertheless disagreed: he claimed that we cannot identify forces of motion and rest with existence itself because forces of motion and rest can have different values, which cannot be said of existence<sup>11</sup>. He also disagrees on another point: according to M. Gueroult, the act of continuous creation and divine impulse creating motion in the world are the same act, while D. Garber discerns in Cartesian texts two different acts. In this latter case, it is impossible to identify force of movement and rest with existence and duration in bodies.

Malebranche's position, which is based on a rejection of the Cartesian notion of “force of rest” in bodies, removes some of these ambiguities and once again brings him closer to Berkeley. He thus distinguishes two situations: that where the relations between surrounding bodies do not change, which obviously refers to the case where all the bodies concerned are in inertial motion, and that where changes in distance relations occur, when we can say that a body is in motion with respect to another. In the first case, God produces no action except to preserve this relationship, which is the same as preserving the bodies in existence:

« I am not considering motion and rest here according to their relative being; for it is obvious that bodies at rest have relations just as real to those around them as those in motion. I conceive only that bodies in motion have a motor force, and that those at rest have no force for their state of rest, because the relation of moving bodies to those around them is always changing; and therefore there has to be a continuous force producing these continuous changes, for in effect it is these changes which cause everything new that happens in nature. But there need be no force to make nothing happen. When the relation of a body to those around it is always the same, nothing happens; and the preservation of this relation, I mean the action of God's will that preserves this relation, is no different from what preserves the body itself<sup>12</sup>. »

In the second case, the changes are still referred to God, but by an act irreducible to continuous creation.

Now it is mostly the second situation that describes the phenomena and requires a physical theory. It leads us to the second point of the *De Motu* and of our discussion: is the explanation in physics described by Berkeley indistinguishable from the occasionalist theory of Malebranche?

---

<sup>9</sup> M. Gueroult, « The Metaphysics and Physics of Force in Descartes », in *Descartes: Philosophy, Mathematics, and Physics*, Gaukroger S. (éd.), Sussex, Harvester Press.Gaukroger, 1980, p. 196-229.

<sup>10</sup> « (...) la force qui réside dans une chose existante n'est rien d'autre que celle par laquelle à chaque instant Dieu la pose dans l'existence », « (...) force, durée, existence sont une seule et même chose sous trois aspects différents », *ibid.*, p. 197.

<sup>11</sup> D. Garber, *Descartes' Metaphysical Physics*. Chicago, University of Chicago Press.

<sup>12</sup> *RV*, VI, II, chap. 9, *op. cit.*, p. 517.

## II. THE EXPLANATION OF PHYSICAL PHENOMENA

The propositions isolated by Popper and which we have not yet commented on indeed concern the nature and status of explanation in physics, apart from the last one to which we will return in conclusion (propositions *b, d, e, f, g, h*).

### 1. Causal explanation in physics and equivalence of hypotheses

A common theme between Berkeley and the Cartesians concerning the epistemology of physics is the absence of physical causal explanation. It is a foregone conclusion in an occasionalist approach: if there are no natural causes, there can be no explanations in physics that – as Popper said - would give us an insight into the true and hidden causes of physical phenomena. We can assume that it was the position, not only of Malebranche, but of Descartes himself: it is the D. Garber's convincing interpretation of Descartes' physics<sup>13</sup>.

So this leads us to the most discussed question of the epistemological content of the *De Motu* : what the physical hypotheses really explain, and what is their validity? Can the same phenomena be explained by different hypotheses? And, once again, how is Berkeley's answer in *De Motu* different from the Cartesian or, even more, the Malebranchean one?

The equivalence of hypotheses is just briefly mentioned in *De Motu* (§67), but it happens to follow naturally from the assumption of non-causal explanation in physics. It is because we do not know how the phenomena derive from their real cause that is God that *different* mathematical hypothesis can be considered, as long as they describe properly, and do not causally explain, the phenomena.

Defending the possibility of explaining phenomena by different mathematical hypotheses seems to constitute from Berkeley an attack on Newton's mathematical physics much more than on the metaphysical physics of Descartes or the form of positivism defended by Malebranche. As N. Guiccardini argued, Newton intended to subject physics to mathematical certainty, the model of which he found in the geometry of the Ancients as opposed to the Cartesian algebraic analysis.<sup>14</sup> Only the former constructs its solutions genetically from motion. This seems to imply a certain conception of phenomena: as objects of explanation in physics, they must possess a mathematical, and more exactly, a geometric form, which can be deduced from others and from which one can necessarily deduce other propositions. It is how Tycho Brahe's observations gave rise to Kepler's laws, which themselves were generalized through refined geometry by Newton. We certainly do not know the act by which bodies were set in motion in the world, but this does not induce any variation in the hypotheses that must be *deduced from one another*. Newton's physics works because nature is essentially a geometric structure. But this position calls into question Berkeley's epistemology insofar as geometric relations would constitute the constraints under which the order of phenomena is conceived instead of being generalized from them and provide instruments to describe them most effectively. So Berkeley has to reject the possibility of a *mathematical deduction* of phenomena, of which physics can only offer a *description*.

### 2. Playing Descartes against Newton?

---

<sup>13</sup> D. Garber, *Descartes embodied*, 2001, §10 : Descartes and occasionalism, p. 203-221

<sup>14</sup> Guiccardini, *Isaac Newton on Mathematical Certainty and Method*, Cambridge, MA and London: MIT Press, 2009.

If Berkeley sent his *De Motu* to the French academicians, it may have been because he thought he could find in them a counterweight to the rise of Newtonian deductive physics.

For Descartes and Malebranche, it is indeed impossible to deduce *a priori*, that is without any experience and by proceeding from the causes to the effects, the laws of the physical world, and the properties of specific bodies. So both of them make room at some point for equivalence of hypotheses. Malebranche goes further by applying this proposition to the *principles* themselves of physical science, while Descartes narrows it to *particular hypotheses* on the nature and behaviour of bodies.

We know that in the *Principes de la philosophie*, Books I and II, Descartes explains the nature of matter and bodies by their clear and distinct ideas: extension, figure, motion. He also deduces from the immutability of God the principle of inertia and the conservation principle of the quantity of motion. In the third and fourth book, he wants to explain the multiple phenomena of the visible world: the nature and motion of the planets, the stars and the comets, the tides, the heat, magnets, and so on. But in this domain, Descartes clearly specifies that we are only left with hypothetical propositions, not causal explanations, given our ignorance of God's plans<sup>15</sup>. God could have created this world in many different ways, and it is also possible that the world could appear the same to us while it would have been made differently by God. The world is created mechanically, but there are many ways to do it, just as a watchmaker could create by various arrangements a watch of the same appearance. The world could look the same to us even if its reality was different, as two watches can look identical from the outside. Descartes doesn't claim proposition (*h*) though, but only that we *can not know* and *deduce* which mathematical or geometrical hypotheses are the right ones.

Besides, if, for Descartes, particular hypotheses about specific phenomena are only suppositions, and, as such, can be multiple as related to the same phenomena, the principles and laws of motion (principle of conservation of motion, laws of impact), are absolute, since they are directly deduced from the nature of God. These are the principles, and their justification, that Berkeley is talking about in *De Motu* (§ 36).

It seems that Malebranche offers an epistemological approach rather similar to Berkeley's in his opposition to Leibniz concerning the validation of physical principles: "proved by experiments, refined by reason, and rendered universal". What seems to matter to Malebranche are laws consistent with phenomena, and he refuses the possibility to *deduce* them from principles.

The object of the discussion between Malebranche and Leibniz is the principle of conservation of motion: does it apply to the absolute quantity or to the directed quantity of motion? Malebranche does not subscribe to the Leibnizian justifications grounded on the architectonic principle of continuity and refuses the existence of *vis viva* or living forces whose sum, according to Leibniz, is the quantity conserved in the physical world, as opposed to the quantity of motion. Malebranche, on the other hand, eventually agreed with the new conservation principle, but remained deaf to the Leibnizian deductive justifications. In this area, Malebranche proposes what can be called a positivist approach:

« Certainement on ne peut en ce cas découvrir la vérité que par l'expérience. Car comme on ne peut embrasser les desseins du Créateur, ni comprendre tous les rapports qu'ils ont à ses attributs, conserver ou ne conserver pas dans l'Univers une égale quantité absolue de mouvement, cela paraît dépendre d'une volonté de Dieu purement arbitraire dont par

---

<sup>15</sup> Descartes, *Principes de la philosophie*, IV, art. 204.

conséquent on ne peut s'assurer que par une espèce de révélation, telle qu'est celle que donne l'expérience<sup>16</sup>. »

The physical world responds to laws, by virtue of the principle of the simplicity of ways, but it is only by experience that one can determine which law is implemented in the world. This position is not necessarily occasionalist: it implies our ignorance of the real causes of the motions of bodies, but not necessarily the denial of any causal power of the bodies. But Malebranchist occasionalism necessarily led to this form of positivism which could have suited Berkeley quite well.

As we said, Malebranche goes further than Descartes by treating the principles of motion the way Descartes considered the particular hypotheses in physics, as presuppositions only validated by experience. As a matter of fact, he is probably more consistent than Descartes on this subject: the metaphysical deduction of the conservation of motion from the immutability of God in the *Principes de la philosophie* is rather weak, and it is possible that Descartes himself was not really convinced by it. The immutability of God just tells us that some quantity related to motion must be conserved, but not which one. Besides, Malebranche conceives physical explanation as a derivation from general laws because that is what implies the principle of simplicity of divine ways. Once again, it's almost indiscernible from what the §36 of the *De Motu* states.

Does Malebranche elaborate the same epistemology of physics that Berkeley later develops in his own terms in *De Motu*? There are some differences that we have yet to consider in conclusion.

### III. SURFACES RESEMBLANCES ?

#### 1. Physical and metaphysical principles in *De Motu*

If the author of *De Motu* seems to reach conclusions similar to Malebranche's in the field of natural knowledge, these comparisons may only constitute surface resemblances, proceeding from different approaches and principles. In particular, Berkeley's more bottom-up approach would be contrasted with Malebranche's top-down one, the former based on the nature of phenomena as they are perceived by the mind, the latter starting from an analysis of the divine action and power. The phenomenalism of *De Motu* would just opportunistically coincide with the form of occasionalism defended at the same period by Malebranche<sup>17</sup>.

If the conformity to sensible experience is for Malebranche the ultimate criterion to judge the validity of a physical proposition, it is indeed true that some metaphysical claims play an essential role in his physics as regulating principles. Natural philosophy requires a knowledge of the general nature of bodies to form hypotheses, whose correct ones will be established by experience, and to exclude some others, like attraction or action at a distance, incompatible with the essence of bodies. The existence of laws of nature themselves is only

---

<sup>16</sup> « Certainly, in this case, the truth can only be discovered by experience. For as one cannot embrace the Creator's designs, nor understand all the relations they have to his attributes, to preserve or not to preserve in the Universe an equal absolute quantity of movement, that seems to depend on a will of God purely arbitrary, of which consequently one can only be sure by a kind of revelation, such as that which experience gives. », Malebranche, *Avertissement aux lois de 1700, Œuvres complètes, Paris, Vrin, XVII-1, p. 55.*

<sup>17</sup> That is S. Lee's conclusion to his article "Berkeley and Malebranche", *Oxford Handbook of Berkeley, op. cit.*, p. 478: "Berkeley's occasionalism seems to be an "occasionalism contained" within his metaphysics".

justified by the nature of divine action. So, ultimately, physics is grounded on metaphysics, that is on principles that are not necessarily derived from senses.

But is this really different from Berkeley? Do we not find these same regulating metaphysical principles in *De Motu*? And are they that different from the Malebranchian ones?

*De Motu* is indeed pervaded with metaphysical claims on the nature of bodies and space. We have mentioned some of them and G. Brykman made a list of specifically cartesian ones<sup>18</sup>:

- Cartesian dualism between thinking and extended substances, the stronger version of the activity/passivity dualism.
- The “cogito” as internal consciousness and distinct from any other form of representation.
- Scientific knowledge reduced to the knowledge of sensible effects.
- Continuous creation strictly applied to the physical world.
- Extension considered as a positive quality (*De Motu*, §53).

It is from these premises on the *nature of bodies* and *causal activity* in the physical world that Berkeley rejects the Newtonian theory as a truly causal explanation even if it describes adequately the actual phenomena. His mathematical hypotheses are useful fictions, insofar as the forces they describe do not have any kind of reality in nature.

## 2. The immaterialism

To summarize, how can *De Motu* be considered an occasionalist text? Here are the similarities:

- Force do not exist in bodies, it is an obscure idea originating in our psychological interaction with bodies.
- There is no true causal explanation in physics because only God, whose complete action is unknown, is cause in the physical world.
- There are different possible hypotheses, if not principles, to explain the same phenomena.
- Laws are the objects of physics.
- Physics cannot be elaborated without some metaphysical regulating principles.

So what is left of the Mach-Popper interpretation of Berkeley’s epistemology of physics? How comes that *De Motu*, instead of been read as a standard account of physical science for his time, has been singled out by commentators like Popper for its striking modernity in the field of natural philosophy?

There is one proposition that Popper mentions which cannot be attributed to anybody other than Berkeley among his contemporaries: it is the proposition (*i*) claiming that there is nothing physical behind the world of physical appearances, no occult physical reality. It is, of course, an expression of the principle of immaterialism, demonstrated in the *Principles of human knowledge* but is nowhere to be found in *De Motu*. According to Popper, that is the deep agreement between Berkeley and Mach and the cornerstone of their phenomenalism. But it appears from what we have shown that it can be completely separated from all the other propositions listed by Popper, since Berkeley himself excludes his phenomenalism from his

---

<sup>18</sup> Revue internationale de philosophie, vol. 33, n° 129 (1979), p. 558. Doesnt mean he endorsed Cartesian dualism: Atherton, p. 245.

account of physical science in the only text dedicated to this matter, *De Motu*. We could also add that the critique of general abstract ideas, implied by his sensualism, converges here with the Cartesian critic of Aristotelian general terms. It looks as if immaterialism is not incompatible with Berkeley's epistemology of physics, but it is also not necessary for it. His theory of physical explanation works without it, and therefore should be interpreted without it.

In conclusion, it seemed interesting to us to proceed to an internal reading of *De Motu* to question some oppositions on which we operate in the field of physics from the beginning of the eighteenth century and its mathematization. It seems that Berkeley found a way with *De Motu* to play Malebranche against Newton, and in doing so, revealed convergences of principles with the occasionalism of the first which never really had the opportunity to reveal itself before.

Claire Schwartz, IREPH, Université Paris Nanterre