Knowledge in Motion: The Circulation of Maupertuis's *Discours sur les différentes figures des astres* (1732) between Switzerland and Germany

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Abstract: This paper explores the circulation of philosophical ideas in the early modern period by examining the elaboration and reception of Pierre-Louis Moreau de Maupertuis's *Discours sur les différentes figures des astres* (1732), widely regarded as the first Newtonian treatise ever published in France. Drawing on insights from cultural history, I argue that the circulation of knowledge was not only an intellectual process, but also involved practical and material factors. In particular, I emphasise the role of personal networks, such as that of Johann Bernoulli, in facilitating the dissemination of scientific and philosophical books across Europe. The paper also highlights the importance of reviews as a medium for engaging with new knowledge, influencing debates, and extending intellectual controversies beyond national borders. The example of Christian Wolff's review of the *Discours* published in the *Nova Acta Eruditorum* in 1733 is used to illustrate the potential of reviews to "territorialise" – in Wolff's case, "Germanise" – a foreign natural-philosophical debate.

Keywords: circulation of knowledge, Newtonianism, Pierre-Louis Moreau de Maupertuis, Johann Bernoulli, Christian Wolff, philosophical reviews.

1. The Circulation of Philosophical Ideas: A Culturalist Approach

Amongst historians of philosophy, there has been a long-standing interest in the study of the circulation of knowledge. Investigating the circulation of knowledge implies an examination of "how knowledge moves, and how it is continuously moulded in the process" (Östling et al. 2018, 17). A good example of the study of circulation, in terms of the quality and quantity of works published, is the historiography of the dissemination of Isaac Newton's (1643-1727) natural philosophy in Europe in the eighteenth century.[1] Newtonian theories spread to different regions and were received and adapted differently according to local sensibilities, especially as they were grafted onto pre-existing debates. One might consider the reception of Newton's natural philosophy in the Netherlands, where

[1] For a general overview of the European reception of Newton's theories, see Mandelbrote and Pulte 2019.

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its acceptance was favoured by the local sensitivity to experimentalism, but also by its theological relevance, as it was seen as a useful tool to combat superstition and incredulity (Israel 2006, 201-203; Jorink and Maas 2012). A different case is that of the diffusion of Newtonianism in Italy, where its implantation was more complex: although the vestiges of the Galilean tradition constituted an optimal environment for its germination, numerous Peripatetic and Cartesian philosophers thwarted its advance, often motivated by concerns over heterodoxy rather than solid scientific criticism (Casini 2022, 73-75).

The circulation of knowledge is usually studied as an intellectual process. The diffusion of ideas is conceived, to quote a famous theory of the biologist Richard Dawkins, as the transmission of "memes," namely cultural units (ideas, beliefs) that can travel from one mind to another (Dawkins [1976] 2016). Memes evolve historically according to the laws of evolution, i.e. they undergo processes of variation, competition, selection and inheritance, since their success lies in their ability to influence the greatest number of individuals. The parallel with memetics is here useful to emphasise that historians of philosophy often tend to study circulation as a phenomenon in which the human mind is the main, and oftentimes the only, actor.

However, it is important to recognise that the circulation of knowledge, at least before the advent of the "information age," necessarily involved a gesture of a practical, physical nature. Consider the early modern period (c. 1600-1800) on which this paper focuses: in this era, marked by the rise of print culture, knowledge circulated thanks to networks of travel and exchange – as well as, in the words of historian Robert Darnton (2021), of "pirating" and counterfeiting – that allowed books to move from one place to another.[2] While this observation may seem trivial at first glance, adopting it as a methodological precept can help to make the often too abstract history of the circulation of philosophical ideas more tangible, transforming it into a history of the particular trajectories of objects and people, namely the supports that conveyed theories and the carriers who facilitated their circulation. To be sure, my aim is not to break down intellectual circulations into a heap of microhistories, thereby atomising the historical narrative; rather, I aim to suggest that any "diffusionist" account conceals a complex web of mediations, negotiations, gaps, dead ends – in short, a physical and living network.

In materialising the circulation of ideas, this contribution adopts a culturalist approach to the history of philosophy, which – to quote a programmatic text co-authored by three French historians – considers philosophy "at once a theoretical knowledge, a social practice and a cultural object" (Anheim, Lilti and Van Damme 2009, 7). The aim of this paper thus is to provide an example of the fruitfulness of broadening the scope of the historiography of philosophy with insights from cultural history, an approach that is sometimes announced

[2] Roger Chartier and Henri-Jean Martin have described the period 1660-1830 as the age of the "triumphant book" (Chartier and Martin 1984).

in the presentation of scholarly work, but rarely adopted as a consistent research methodology.

This study analyses a key episode in the circulation of Newtonian natural philosophy in France and Germany during the first half of the eighteenth century: the early reception of Pierre-Louis Moreau de Maupertuis's (1698-1759) *Discours sur les différentes figures des astres* (*Discourse on the Different Shapes of the Stars,* 1732), widely regarded as the first Newtonian treatise ever published in France.[3] After an analysis of the genesis of the *Discours,* which was greatly influenced by Maupertuis's discussions with his mentor Johann Bernoulli (1667-1748), and a brief presentation of its contents, I focus on the reviews that the volume received. In particular, I consider the review that appeared in the *Nova Acta Eruditorum* of Leipzig in July 1733, written by the philosopher Christian Wolff (1679-1754),[4] as we have traces that enable us to reconstruct the volume's journey from Paris to Leipzig via Basel, elucidating the material and personal networks integral to this trajectory. I provide a comparison between the reviews of the *Discours p*ublished in France and that written by Wolff, to show that the latter, removed from the immediate context of the French debates on Descartes's and Newton's natural philosophies, used the act of reviewing as an opportunity to "territorialise" – one might also say "Germanise" – the philosophical debate that Maupertuis's book fed. In fact, my approach also emphasises the cultural aspects of the activity of reviewing, since this new philosophical genre, typical of the early modern period, is a crucial factor to consider when studying the circulation of ideas.[5] Building on the insights of Michel de Certeau (1925-1986) – who suggested that consumers are in fact practitioners who are active in relation to the objects (or representations) prescribed for them, and who went as far as to characterise the very activity of reading as "silent production" (de Certeau [1980] 1990, XLIX) – I argue that critical readings of a philosophical text are as many reappropriations of its content as they are dependent on the intellectual agendas of its readers.

[3] In the *Discours préliminaire de l'Encyclopédie* (*Preliminary Discourse to the Encyclopaedia),* Jean le Rond d'Alembert (1717-1783) writes: "It is necessary only to open our books in order to see with surprise that twenty years have not yet passed since we began to renounce Cartesianism in France. The first among us who dared declare himself openly Newtonian was the author of the *Discours sur la figure des astres,* who combines a very extensive knowledge of geometry with the kind of philosophical mind not always found in conjunction with it, and also a talent for writing to which his geometrical knowledge certainly does no harm, as will be seen upon reading his works. Maupertuis believed that one could be a good citizen without blindly adopting the physics of one's country; and we ought to be grateful to him for the courage he had to display in attacking that physics" (d'Alembert [1751] 1995, 88-89).

[4] Although the review was published anonymously, Augustinus H. Laeven and Lucia J. M. Laeven-Aretz were able to discover the identity of its author (Laeven and Laeven-Aretz 2014, 106). I would like to thank Mattia Brancato for suggesting this reference to me.

[5] On philosophical reviews in the early modern period, see the research project "PREME-Philosophical Reviews in Early Modern Europe (1665-1789)," based at the Ca' Foscari University of Venice and at the University of Verona (https://pric.unive.it/projects/preme/home).

2. Maupertuis and Bernoulli

In March 1731, Maupertuis sent Bernoulli his thoughts on the shape of the Earth – stating that he could not properly understand what Newton had said on the subject[6] – and, more generally, the results of some of his research on rotating celestial bodies. Maupertuis discussed the shapes that celestial bodies must take due to the action of gravity and centrifugal force, even dealing with complicated cases such as the explanation of Saturn's rings. Bernoulli found Maupertuis's solutions convincing and encouraged him to publish them (Bernoulli to Maupertuis, 1 April 1731).[7] Maupertuis followed Bernoulli's suggestion and communicated his results to the Royal Society of London. His paper, written in Latin, was entitled *De figuris quas fluida rotata induere possunt, problemata duo; cum conjectura de stellis quae aliquando prodeunt vel deficiunt; et de aunulo Saturni* (*On the Shapes that Rotating Fluids Can Assume, in Two Problems; with a Conjecture on the Stars That Sometimes Appear or Disappear; and on Saturn's Ring*), and was read at the meeting of 8 July 1731; the text was subsequently published in the *Philosophical Transactions* of 1732 (n. 37, 240-256).

The *De figuris,* as Maupertuis wrote to Pierre des Maizeaux (1666-1745) in response to a query from the mathematician John Machin (1680-1751), contained "mathematical solutions rather than actual physical explanations."[8] However, Maupertuis had greater theoretical ambitions, especially when it came to offering his research to the French public, less receptive than the English to a mathematical physics inspired by Newton. Published in late 1732, the *Discours* added to mathematical problems "a preliminary [discussion] of gravity, in which I set out the different ideas held by Cartesians and Newtonians"; as Maupertuis stressed in his letter to Bernoulli of 4 August 1732, "as soon as this little work is printed, I'll take the liberty of sending [a copy] to you."

Bernoulli was careful not to enter into direct controversy with his pupil. He responded to Maupertuis by introducing the subject of a treatise of his own with which he intended to enter for a prize announced by the Paris Academy of Sciences (for 1732, postponed to 1734), which would later be published under the title *Nouvelles pensées sur le système de M. Descartes* (*New Thoughts on Descartes's System*), in which he adopted epistemological principles opposed to Newtonian ones.[9]

[6] For Newton's discussion of the shape of the Earth, see the propositions 18-20 of the third book of the *Principia* (Newton [1687] 1999, 821-832).

[7] The manuscript correspondence of Johann Bernoulli has been digitised as part of a larger project concerning the whole Bernoulli family (Basler Edition der Bernoulli-Briefwechsel) and is available at the following address: https://ub-mediawiki.ub.unibas.ch/bernoulli/index.php/Kategorie:Bernoulli_Johann_I. All the letters exchanged between Bernoulli and Maupertuis that I will mention in this paper are available at this web address. The original papers are kept at the University Library of Basel.

[8] British Library, Add. Ms. 4285, fol. 212. On Maupertuis's exchange with des Maizeaux see Terrall 2002, 66.

[9] The question posed by the Paris Academy was the following: "What is the physical cause of the inclination of the planes of the planets' orbits in relation to the plane of the equa-

> I shall perhaps be able to put forward my theory on the gravitation of the planets towards the Sun […]. Be that as it may, if I take the trouble to write something, I shall treat my subject as a physicist, without mixing much geometry [read: mathematics] into it, content to give principles from which we can deduce a probable cause, according to the laws of the mechanics of the phenomenon in question; that is all that is required of a physicist, we leave it to the geometers [read: mathematicians] to make the calculations […] (Bernoulli to Maupertuis, 17 August 1732).

Bernoulli resorted here to a classic argument from the anti-Newtonian repertoire of the early eighteenth century, which accused the Newtonians of constructing mental rather than physical models, as they relied on mathematical abstractions. For the Cartesians – and here Bernoulli repeats the same argument – the true essence of physics was the construction of mechanical models based on principles of reality (including the transmission of motion by direct contact, the negation of vacuum, and so forth). Bernoulli's system was essentially equivalent to Newton's; the main difference was in the philosophical grounding of the scientific models, since Bernoulli explained the motions of the heavenly bodies "by the only principles of mechanics, received from all the modern philosophers of whatever faction they are" (Bernoulli to Maupertuis, 9 October 1732).

As for what he expected from Maupertuis's forthcoming book, Bernoulli downplayed the philosophical significance of the text, employing the well-worn anti-Newtonian critique mentioned above: "I believe that your aim is mainly to treat your subject in geometry" (Bernoulli to Maupertuis, 27 November 1732). The *Discours* was in fact much more radical than Bernoulli had expected. In addition to a discussion of the problems associated with the figure of rotating celestial bodies (chapters 6-8), it discussed the two main world systems, the Cartesian and the Newtonian, and compared the strengths and weaknesses of each (chapters 3-5). Maupertuis prefaced this comparison, from which the Newtonian system emerges as more consistent in explaining phenomena, with a "metaphysical discussion of attraction" (chapter 2), which is the most original part of the text from a philosophical standpoint.

The problem that some critics attributed to the Newtonian system, and which partly explained the continuing success of Cartesianism, was the mysterious nature of attraction. Many considered it to be an occult quality, similar to those introduced by the Scholastics to explain phenomena they did not understand. Maupertuis therefore set out to examine whether attraction was really a "metaphysical monster" (Maupertuis 1732, 13), i.e. whether it was contradictory to assume that this force was inherent in physical bodies. Building on John Locke's (1632-1704) critique of the idea of substance and his insistence on the limits of the intellect, Maupertuis argued that our knowledge of things is limited to a small number of properties and, more importantly, that we have no knowledge

tor, of the Sun's rotation around its axis, and why do the inclinations of these orbits differ?" (Maheu 1966, 213). The prize was awarded *ex aequo* to Johann and his son Daniel Bernoulli.

of the substratum underlying these properties. Therefore, any statement about natural reality is underdetermined. With the exception of certain primordial properties of matter, such as impenetrability, it is impossible for our limited intellect to exclude the possibility that other properties – as long as they do not conflict with the primordial ones – belong to the nature of bodies. Experience is the only guide that can confirm or deny such attributions of properties.[10] As the parallel of the two systems developed in the following chapters shows, experience validated Newton's system, and thus provided an *a posteriori* confirmation of its fundamental principles – including the most controversial ones, namely attraction and vacuum.

3. From Paris to Leipzig, through Basel

In the circulation of Newton's natural philosophy in eighteenth-century Europe, the work of Maupertuis played a key role, especially in the early 1730s, which marked the auroral phase of French Newtonianism. The *Discours* represented an authoritative peroration – authoritative because Maupertuis was a member of the Paris Academy of Sciences, one of the most important scientific institutions of the time – in favour of the new English physics, towards which the first continental readers, amongst them Christiaan Huygens (1629-1695) and Gottfried W. Leibniz (1646-1716), had been highly sceptical. In this section, I examine the penetration of this text into Germany through a series of material mediations that passed through Bernoulli's house in Basel. The history I offer of the circulation of the *Discours* will serve as an example of a material history of the circulation of knowledge in the early modern period.

The Bernoulli family was at the centre of European scientific life due to their extensive personal connections with numerous prominent figures and institutions. One notable example is the Bernoulli's role in promoting the international career of Leonhard Euler (1707-1783), as Johann encouraged him to apply for various positions and eventually helped him to enter the St Petersburg Academy of Sciences, where Johann's son Daniel (1700-1782) was already working.[11] Even prior to the publication of the *Discours,* Maupertuis leveraged Bernoulli's European network as a source of book supply, not solely for scientific texts. One issue that came up frequently in the letters of 1732 and 1733 is Maupertuis's re-

[10] "If we had complete ideas of bodies; if we knew well what they are in themselves, and how their properties affect them; how and in what number they [the properties] reside there [in bodies]; we would not be embarrassed to decide whether attraction is a property of matter. But we are very far from having such ideas; we know bodies only by a few properties, without knowing anything about the subject in which these properties are reunited. […] It would be ridiculous to wish to attribute to bodies other properties than those which experience has taught us are to be found in them; but it would perhaps be even more ridiculous to wish, on the basis of a small number of scarcely known properties, to pronounce dogmatically the exclusion of all others; as if we had the measure of the capacity of subjects when we know them only by this small number of properties" (Maupertuis 1732, 13-16). See Downing 2012, 290-298.

[11] On Euler's biography, see Fellmann 2007.

quest for a "Chinese grammar." At Maupertuis's request, Bernoulli arranged for the book to be sent from Russia and subsequently transported to Paris, using some of his acquaintances who were travelling in France as couriers.[12] Bernoulli described the Chinese grammar as a beautiful book, while conjecturing that Maupertuis wished to give the volume as a gift to an acquaintance of his:

> It is undoubtedly a curious book for lovers of oriental languages, the Chinese characters are all engraved in intaglio, there is also a small dictionary of that language with explanations of the words in Latin; I imagine that you are asking for it for a friend, for I have never taken you for a connoisseur of the Chinese language (Bernoulli to Maupertuis, 2 November 1732).

The text, whose title is never mentioned, is probably the *Museum Sinicum* published in 1730 by Gottlieb Siegfried Bayer (1694-1738), one of the greatest sinologists of the time, who worked at the St Petersburg Academy. Maupertuis also used Bernoulli's Russian connections to obtain copies of various scientific works that his mentor had received from the St Petersburg Academy, of which he was a member.[13] Indeed, we know from other correspondence that Bernoulli's formal membership of the St Petersburg Academy did not entitle him to remuneration in money but in books. As Bernoulli pointed out in a letter to Johann Scheuchzer (1672-1733), at the St Petersburg Academy he enjoyed "the simple honour [of being a member] without pension and without any other emolument than perhaps the works that will be printed there and of which a copy will be sent to me free of charge" (Bernoulli to Scheuchzer, 22 October 1729).

Bernoulli's European network proved fundamental to the circulation of the *Discours* and thus, more generally, to the penetration of French Newtonianism in Germany. Maupertuis sent the book to Bernoulli at the end of 1732, and Bernoulli received it in early January. In his letter of 6 January 1733, Bernoulli wrote: "Since this letter I have received the parcel of four copies of your excellent *Discourse on the Different Shapes of the Stars.*" Of these four copies, Bernoulli proposed to send one to Leipzig, where it could be reviewed in the *Nova Acta Eruditorum,* the continuation of the renowned journal (the *Acta Eruditorum)* which, some decades earlier, had hosted various articles in favour of Leibniz in the context of the calculus controversy. Bernoulli entrusted the copy of the *Discours* addressed to Leipzig to Frédéric Moula (1703-1782), a Swiss mathematician and member of the St Petersburg Academy, to deliver to the editors of the journal on his way to Berlin.

[12] In the letter of 20 October 1732, Maupertuis mentions "Moscow (*Moscovie)*" as the place from which the book came.

[13] In the letter of 14 April 1732, Maupertuis stressed that he still owed Bernoulli a sum for a copy of the *Commentarii Academiae Scientiarum Imperialis Petropolitanae,* the annual collection of the papers published by the St Petersburg Academy: "A long time ago, Deucher took it upon himself to pay you back the 100 sous I owed you for the memoirs of St Petersburg." Johannes Deucher (1673-1747) was a merchant in Strasbourg and Paris. He was a partner in the bank Labhard & Cie, founded in Paris in 1713. In 1720 he bought the Castle of Bottmingen near Basel. He died there in 1747, leaving no direct heirs (Müller von Blumencron 1992, 105–7).

Bernoulli's letters to Maupertuis reveal some interesting elements concerning the circulation of the text. The first element concerns the role of Bernoulli's authority. The copy of the *Discours* sent to Leipzig was accompanied by a letter inviting the editors of the *Nova Acta t*o make an extract of the book as soon as possible: "[Moula] took charge of your book for the collector of the *Acta* of Leipzig, accompanied by one of my letters to him, in which I ask him to have an extract made of it so that it can be inserted in the journal" (Bernoulli to Maupertuis, 5 February 1733). This letter, apart from its content (which is unknown to us), guaranteed the visibility of Maupertuis's work. Maupertuis, although already a member of the Paris Academy, was a young author little known outside France and England.[14] Moreover, Bernoulli relied on his personal connections with some of the journal's editors, in particular Wolff, who was one of his correspondents, and also the designated reviewer of Maupertuis's book. The second element is the discretion required of Moula for the delivery. Bernoulli stressed that he had "strongly recommended to Mr Moula to ensure that the parcel is delivered to the said collector immediately and in complete secrecy" (Bernoulli to Maupertuis, 5 February 1733). This secrecy is a symptom of the desire to keep the circulation of the text within a network of trusted persons, but it was also a key to increasing the curiosity of the recipients and giving it priority over the volumes that were routinely received.

Before turning to the analysis of the review published in the *Nova Acta,* it is interesting to note that only a few months later Wolff wrote a letter to Maupertuis emphasising his interest in the *Discours* and his admiration for the Frenchman's work – although, as we shall see, the review (published anonymously) was less laudatory and in fact quite critical of Maupertuis's views.

> No sooner had I heard through the grapevine […] that you had published your *Discourse on the Different Shapes of the Stars,* than I burned with such a desire to read it that I would have moved heaven and earth to get hold of it. Reading it, however quickly, fully satisfied my curiosity, so much so that, although you were still unknown to me, I loved you (Wolff to Maupertuis, 20 September 1733, in Le Sueur 1896, 424–25).

These few lines illustrate the strength of Bernoulli's network and, more generally, the deep interconnections between some of the protagonists of the early eighteenth-century Republic of Letters.

4. The Review of Maupertuis's *Discours* in the *Nova Acta Eruditorum*

The significance of the review that appeared in *Nova Acta* can best be understood against the backdrop of the other reviews received by the *Discours,* particu-

[14] In 1728, Maupertuis spent three months in England. During this period, he was admitted to the Royal Society, but also attended a number of coffee houses, notably the Rainbow Coffee House, where Huguenots and freethinkers gathered (Storni 2022, 37–40).

larly those published in France. This is the reason why I have chosen to briefly discuss two French reviews before focusing on the German one.

In the *Histoire de l'Académie des Sciences* of 1732, the perpetual secretary of the Paris Academy Bernard Le Bovier de Fontenelle (1657-1757) discussed Maupertuis's latest publication. Most of the review consisted of a faithful presentation of the text, especially the last chapters, those with the most technical content. Fontenelle completely ignored chapter 2 of the *Discours,* i.e. the "metaphysical discussion of attraction," while making some veiled critical allusions to the problematic metaphysical status of this force: "But it is true that this hypothesis of gravity acting because of the distance to the central point is not as acceptable in physics as it is in geometry or algebra, where only formal contradictions can be excluded" (Fontenelle 1732, 89). In the final lines of the review, Fontenelle acknowledged Maupertuis's preference for Newton, while attempting to refrain from explicit criticism: "[Maupertuis] almost begins his book with a parallel of impulse and attraction, where he does not agree as to the advantages of one over the other. He even gives a parallel of the sentiments of Descartes and M. Newton, and the whole advantage is to the English philosopher" (Fontenelle 1732, 93). Fontenelle's review provides a good representation of the intellectual debates at the Paris Academy, where academicians were encouraged to avoid addressing contentious issues such as natural-philosophical ones. However, in his fidelity to Cartesianism, Fontenelle's text also reveals a tacit opposition to the Newtonian worldview.[15]

Another review of the *Discours a*ppeared in April 1733 in the *Mémoires de Trévoux,* a journal whose editors were mostly members of the Society of Jesus. Mary Terrall (2002, 77) has suggested, with some degree of speculation, that the author of the anonymously published review is Louis-Bertrand Castel (1688-1757). The reviewer goes through Maupertuis's text chapter by chapter. When it comes to chapter 2, he clearly sees the potential philosophical danger of the "metaphysical discussion" and formulates his perplexity in the following terms: "Would Mr Maupertuis want to give attraction more force than Mr Newton gave it? For what he seeks here goes beyond the limits of physics and the factual level, and wishes to establish attraction as a metaphysical and utterly primitive principle of action, movement, weight, etc." (Anonymous 1733, 707). Alongside the reconstruction of the contents of the *Discours,* there are a few passages of more general critical discussion in which the reviewer set out his natural philosophical ideas, inspired by the Cartesian tradition. In his view, Maupertuis should have realised that Newtonian attraction "is a purely geometric and mathematical principle, which explains nothing physical" (Anonymous 1733, 711). Contrary to what the Newtonians believed, "the Cartesians" were in fact those who formulated hypotheses based on empirical evidence, namely grounded on data

[15] Fontenelle remained a Cartesian to the end of his life. His *Théorie des tourbillons cartésiens, avec des réflexions sur l'attraction* (*Theory of Cartesian Vortices, with Some Reflections on Attraction*), published in 1752, is usually regarded as the swan song of French Cartesianism, and the final act of the "Newton Wars" in France (Shank 2008, 468).

that "resemble facts much more than all those which Mr Maupertuis here describes by that name" (Anonymous 1733, 711). In this sense, the review implicitly presented Maupertuis as a radical Newtonian, who wanted to go beyond Newton's more serious and modest presentation of his theories.

> What should a sound philosophy not attempt, instead of admitting vacuum and attraction? Mr Newton himself never seems to have dared to support or present this idea, except after wrapping himself in the most profound geometry. Whenever he spoke openly and to the public, he always modified his discourse and softened his ideas with "perhaps," with suspensions, with corrections (Anonymous 1733, 716–17).

The review that appeared in the *Mémoires de Trévoux* provides a valuable insight into the critical reading of Newtonian natural philosophy provided by the Jesuits, who were supporters of the Cartesian perspective, mixed with remnants of Aristotelianism (Storni 2024, 236–38). Since the epistemological compass of the Jesuits was intuition and common sense, they criticised Newtonian physics for the obscurity of its principles and the abstractness of its demonstrations, thus opposing the rise of mathematical physics. There was another point of controversy which was never explicitly mentioned, but which was central to the Jesuit polemic against the Newtonians: the idea that the Newtonian approach, underpinned by radical empiricism, was conducive to materialism and atheism. Indeed, the Jesuits feared that French Newtonians would come to support the same theses that were being advocated in England by authors such as John Toland (1670-1722), who in his *Letters to Serena* (1704) took up Locke's suggestion of "thinking matter" to establish a form of Spinozist materialism based on the idea that matter is intrinsically active.[16]

At first glance, the review published in *Nova Acta* differs from the French reviews in two ways. Firstly, it is much shorter, occupying only five pages; secondly, it is written in Latin and thus addressed to a scholarly, but at the same time international (who did not necessarily read French), audience. As in the case of the French reviews, Wolff's followed Maupertuis's arguments step by step, but was nevertheless original in several respects. The first is that the reviewer took seriously the philosophical stakes of chapter 2 of the *Discours*. Summarising the metaphysical discussion, Wolff wrote the following:

> So that he [Maupertuis] does not seem to be praising unreasonably the Newtonian [system], which satisfies the phenomena to the extent that it makes many of them appreciable, he introduces a certain metaphysical discussion of

[16] Toland's inspiration came from an interpretation of the following passage of Locke's *An Essay Concerning Human Understanding* (1689) IV.3.6: "We have the ideas of matter and of thinking, but possibly shall never be able to know, whether any material being thinks, or no; it being impossible for us, by the contemplation of our own ideas, without revelation, to discover whether omnipotency has not given to some system of matter fitly disposed, a power to perceive and think, or else joined to matter so disposed, a thinking immaterial substance" (Locke [1689] 1975, 540–41).

> attractions, in which, relying on Lockean notions, he endeavours to remove the absurdity from attraction when considered a primitive quality inherent in matter; however, he does not dare to decide whether this universal attraction is a real thing or not (Wolff 1733, 317).

It was the first (and only) review to mention Locke as a source for Maupertuis. More generally, Wolff seemed to recognise the radical nature of Maupertuis's argument, in that – contrary to the prevailing opinion, at least of his fellow countrymen – he sought to demonstrate that is was not contradictory to attribute an attractive force to matter. The reviewer insisted, however, that the *Discourse* as a whole was not explicitly favourable to Newton. In fact, he seemed to take seriously Maupertuis's apparent oscillation between the two systems, which actually came down to a few rhetorical phrases inserted here and there in the text.[17]

> He [Maupertuis] therefore concludes that no one has been found so far that could save the vortex system, although from there he never infers its impossibility. Newton excellently explains, and demonstrates with geometric rigour, the celestial motions, through the hypothesis of attraction, which agrees admirably with Kepler's laws. He [Maupertuis] also shows that planetary motion and gravity depend on the same cause. But in the meantime, he openly admits that he has no distinct idea of universal gravity, of the inherent matter, of the Newtonian attractive force, or of the impulsive force, and he thus remains so much in doubt as to which system corresponds to truth (Wolff 1733, 317–18).

Such remarks may be the result of a lack of understanding of Maupertuis's rhetoric, but they may also be the consequence of a precise reading strategy. They may be an indirect sign of the reviewer's scepticism towards Newton's system, which, despite its obvious experimental strengths, should never be declared superior to the Cartesian or absolutely true. The insistence on Maupertuis's hesitation could also be read as a veiled criticism: even a proponent of Newtonianism like Maupertuis found sufficient ambiguity in Newton's theories to refrain from overtly aligning with him.

A final original aspect of Wolff's review concerns the presentation of the central chapters of the *Discours,* particularly those devoted to the exposition of Cartesian cosmology (chapters 3 and 4). Wolff dwelt little on Descartes, while devoting more space to the exposition of the cosmological views of Leibniz and Georg Bernhard Bilfinger (1693-1750), a theologian and philosopher deeply influenced by Wolff himself. Maupertuis mentioned both of these authors in the *Discours* but gave them far less prominence than Descartes and Huygens. For

[17] For example: "It must be admitted that we have not yet been able to reconcile vortices with phenomena in a satisfactory way. But this does not mean that vortices are impossible. Nothing is more beautiful than the idea of Mr Descartes, who wanted to explain everything in physics by matter and motion; but if we want to preserve the beauty of this idea, we must not allow ourselves to assume matter and motion for any other reason than the need we have for them" (Maupertuis 1732, 33).

Maupertuis, the cosmologies of Leibniz and Bilfinger were, in fact, adaptations of the Cartesian cosmology, but they could not remedy the flaws of the vortex system. Wolff gave much space to the two German authors, quoting their works in a laudatory manner (e.g. he cited a paper by Bilfinger that had been awarded by the Paris Academy) and with precise bibliographical references.

> Descartes explained the motion of the planets around the Sun and the phenomenon of gravity through vortices of a certain subtle matter; but, when the same system was applied to explain Kepler's laws of celestial motions, it was observed to be in little agreement with them. The way in which Leibniz tried to remove the difficulties, so that the same [system] might be brought into agreement with these laws, may be read in *Acta* 1689, p. 82. Bilfinger, now professor of theology at the Academy of Tübingen, in a dissertation on the cause of gravity, awarded a prize by the Royal Academy of Sciences [of Paris, in 1728], similarly shows that different laws must be admitted in vortices if the phenomena are to be satisfied. There is indeed no less difficulty in explaining the cause of gravity for vortices. Huygens tried to find a solution, but he gave up the simplicity of nature: before this failure, Bilfinger tried to bring another remedy, but – in the author's [Maupertuis] opinion – not only did he presuppose motion but, with a very difficult idea, he imagined four vortices in one, two of which strive to oppose the other two, and nevertheless pass through each other without destroying themselves (Wolff 1733, 317).

The repeated references to Leibniz and Bilfinger suggest that Wolff was trying to introduce German authors into the debate on Newtonian natural philosophy. His attempt was in fact to "territorialise" or "Germanise" the controversy between the Cartesians and the Newtonians, which had hitherto been confined to France. In other words, he believed that German authors could also provide relevant contributions to the discussion and deserved to be considered as relevant interlocutors: for Wolff, it was not a matter of explaining their positions in detail, but rather of trying to make them more visible by repeatedly mentioning their names, referring to their works, and citing academic titles that rhetorically attested to their intellectual value, which was no less than that of more "canonical" authors.

5. Conclusion

The study of the genesis and reception of Maupertuis's *Discours sur les différentes figures des astres* offers valuable insights into the circulation of philosophical ideas in the early modern period. I have shown that the circulation of knowledge was not merely an intellectual process, but also involved practical, material factors, the analysis of which reveals a complex web of mediations, interactions, and negotiations. In particular, the case of Maupertuis's *Discours* demonstrates the crucial role played by personal networks, such as the connections of the Bernoulli family, in facilitating the dissemination of scientific and philosophical works across Europe.

I have also emphasised the crucial role of reviews in shaping the circulation of philosophical ideas. Reviews emerged as a vital medium through which philosophers and scientists engaged with new knowledge, offering critiques, interpretations and contextualisations that influenced the reception and trajectories of learned debates. A notable example is Wolff's review of the *Discours* published in *Nova Acta Eruditorum* of Leipzig, which not only critically engaged with Maupertuis's arguments, but also introduced German authors into the debate, thereby extending the Cartesian-Newtonian controversy beyond the French intellectual sphere.

Overall, this study highlights the importance of a multidimensional approach to the history of philosophy, one that takes into account both intellectual and material factors in the circulation of ideas. By doing so, we gain a richer understanding of the complexities involved in the transmission and reception of philosophical knowledge during the early modern age.

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