

Causa sive ratio: causality and reason in modernity between metaphysics epistemology and science

(Abstracts organized by order of presentation)

Sangiaco, Andrea (University of Groningen)

Johann Christoph Sturm's passive forms and the secularization of early modern science

Eighteenth-century science is seemingly characterized by a progressive 'secularization', insofar as theological and metaphysical concerns tend to drop out of the scientific agenda. This process is difficult to understand if compared with seventeenth-century science, in which God and divine action in nature played a crucial role in explaining natural phenomena. In this paper, I focus on Johann Christoph Sturm's account of passive forms as a case study to better understand the conceptual changes that affected the secularization of early modern science. I argue that Sturm's account leads to dissociate the explanans of natural phenomena from considerations about the causal power(s) needed to bring about these phenomena. While Sturm maintains that God is the only true cause of natural effects, he also claims that the specificity of natural effects must be empirically investigated by inquiring into natural forms. Forms no longer have any 'active' role in the causal process but still account for its specific features. I argue that this account of passive forms reveals how theological and metaphysical considerations about God's involvement in nature can be progressively bracketed, by leading to an apparently theology-free science.

Platt, Andrew (State University of New York, Stony Brook)

Knowledge and Causation in Geulincx and Malebranche

Arnold Geulincx and Nicolas Malebranche use the principle "Quod nescis quomodo fiat, id non facit" to argue for Occasionalism, or the thesis that God is the only true cause. The Quod Nescis principle (QN) asserts that I cannot do something that I do not know how to do — that is, I cannot voluntarily produce an effect unless I have knowledge of the process by which the effect is brought about. QN thus links the exercise of causal powers to knowledge: It implies that (as Malebranche puts it) "the will is a blind power which can proceed only toward things the understanding represents to it."

In his *Ethics* (1665), Geulincx uses QN to volitions in the human mind do not even cause motions in our own bodies. I do not know (for example) how the nerves and muscles that connect my brain to my legs need to work to bring about the motion of walking. And since I do not know how precisely this motion is brought about, Geulincx argues, I am not its cause. Yet Geulincx also appeals to QN to argue, in his posthumously published *Metaphysica Vera* (1691), that unthinking bodies are not causes. He takes QN to apply not just to agents that act by means of volitions, but also to what the Scholastic Aristotelians had taken to be "natural agents."

Nadler (1999) tries to explain how Geulincx might have plausibly taken QN to apply not just to volitional agents, but indeed to all efficient causes. Nadler presents several possible rationales for QN. He sketches both Cartesian and Scholastic Aristotelian arguments that could have led Geulincx and Malebranche to "consider volitional agency as the paradigm for causality," and thus to think that QN holds for all efficient

causes. But I argue that Nadler's reconstruction is not plausible as an interpretation of Geulincx's thought. Scribano (2011) and Sangiacomo (2014) note that Geulincx claims that QN is self-evident. I argue that this shows that Geulincx did not take the truth of QN to be grounded in the reasoning that Nadler sketches.

The same point applies to an interpretation of Malebranche developed by Ott (2008, 2009). Ott argues that Malebranche accepts QN because he is committed to an underlying model of causation, according to which causation is essentially intentional: A cause must be able to intend an effect in order to bring about that effect, and the effect is identical to the volitional content of the cause's intention. Ott reconstructs Malebranche's argument from QN () so that it hinges on the claim that a human mind cannot have the volitional content required to move any body. While this seems plausible as a reading of the argument as Malebranche states it in *Christian Meditations* (1683), I argue that Ott's reading does not fit with Malebranche's presentation of this argument in the *Search After Truth* (1674-5). Furthermore, I argue that Malebranche (like Geulincx) takes QN to be a self-evident principle that is not justified by any more fundamental theses about causation.

Adomaitis, Laurynas (Scuola Normale Superiore di Pisa)

Hypotheses ad causam: (Early) Leibniz and Duhem on empirical underdetermination

The paper follows Leibniz's early use of hypotheses in physical methodology of *Theoria motus abstracti* (TMA) and *Hypothesis physica nova* (HPN). The claim is made that the reconstruction of Leibniz's early scientific methodology arrives at something akin to Duhem's empirical underdetermination thesis. Duhem (not Duhem-Quine) thesis is

characterized by the rejection of Baconian crucial experiment. The rejection is grounded in the distinction between "logical contradiction" and "empirical contradiction" (ASPT, p. 185). According to Duhem, the latter is not sufficient for a *reductio* argument which is required by a crucial experiment.

Leibniz has also recognized a similar distinction in *De rationibus motus* (DRM, 1669) by introducing a notion of "ἐναντιοφανεῖα" (A6.2.159). It is understood as an antinomy between abstract study of motion (phoronomy) and experience. The Greek term comes from a legal context and concerns reconciliation of two laws in a codex. Reconciliation generally works on the basis of amending the lower law in favor of a higher law. Analogically in physics: "senses cannot prejudge reason while reason can prejudge senses" (ibid.). So when senses (lower law) seem to contradict theory (higher law) we must postulate a hypothesis that would reconcile the two approaches. A hypothesis does so by producing the observed effects while obeying the phoronomical laws: "when senses appear to contradict reason, we must conclude that there is something that cannot be sensed except for that particular effect" (ibid.). So in case of experimental contradiction there is a need for a hypothesis but there is no *eo ipso* imperative to amend the theory.

This reading is corroborated by Leibniz's use of hypotheses in TMA and HPN. Particular attention is given to *Problemata specialia* §11 in TMA. It concerns mutually rebounding elastic collisions which are observed experimentally but are not deducible from the propositions of TMA. This is a case of an antinomy (ἐναντιοφανεῖα). What is needed to solve it is a hypothesis of ether developed in the HPN. Ether provides the necessary elasticity for mutual rebounding (HPN §22), it is itself insensible (HPN §10), and it is describable by phoronomical laws (theorem §21 of TMA). So it satisfies all the conditions for a hypothesis defined in DRM.

The outcome of Leibniz's conception of hypothesis is a case of empirical underdetermination. Baconian induction relies on a proof similar to *reductio* by which experimental rejection of a deducible proposition of a theory implied confirmation of its contradictory formulation. Leibniz did not subscribe to this view of induction mostly because he adhered to a hierarchical view of phronomy and experience and the view that experience has essential limitations in studying motion. If experience seems to contradict theory, it is not necessary to change the theory. What is necessary is to postulate a hypothesis that reconciles the two approaches.

Mare, Marin Lucio (University of South Florida)

Holographic Causation: Early Modern Phantom Limbs and the Mind-Body Union

What do early modern body-mind causation theories have to say about the phantom limb syndrome, the sensation of pain in a missing limb? In 1764, when he publishes his *Elementa physiologiae corporis humani*, Albrecht von Haller only lists three published records of the phantom limb phenomenon prior to 1637¹ and omits Descartes' description of the same issue in several of his works.² The phantom limb pain presents a case of abnormal impressions of the presence or absence of our own body parts: how does one explain bodymind causation and the correlative mind-body union when a part of the body is absent yet still present to the mind through the sensation of pain? My method in this paper is to use several conflicting 17th century explanations of the phantom limb phenomenon (Descartes/Malebranche – Perrault/Leibniz) as the prism through which to problematize and reinterpret the contentious early modern issue of body-mind causation. Expounding upon his claim of the crucial role of the brain in thought and

sensation,³ Descartes developed a new argument to show that in cases in which a limb is amputated, stimulation of the existing nerves can cause sensations that are felt as being in the place where the limb once was.⁴ Descartes uses this description of the phantom limb phenomenon to show that a severed member in no way affects the unity of the mind/soul⁵ and that pain in the hand is felt by the soul not because it is present in the hand, but because it is present in the brain.⁶ Supported by the observation of phantom limb phenomena, the dualist thesis according to which the mind or soul is not causally affected by the whole body, but only by the brain is further radicalized in Malebranche's occasionalist model of psycho-physical interaction. In his *Recherche de la vérité*,⁷ Malebranche adopts a theory which forms a system with Cartesian physiology, by underlining the role of the brain in sensation. In later texts,⁸ he derives an argument from phantom limbs in order to prove that the soul is not immediately united to its body or to the material world but rather to the idea of its body, and thus to the intelligible world.⁹ Against this Cartesian and occasionalist background, I counterpose two lesser known 17th century body-mind causation doctrines which both share as a central aspect the opposing idea that the "soul is spread throughout the whole body" and coextensive with it: Claude Perrault's theory of the 'physiological' nature of the soul (*Essais de Physique* 1680) and early Leibniz's doctrine of the "flower of substance" (*De resurrectione corporum* 1671; *On the seat of the soul* 1676).¹⁰ Consequently, because of the co-extensiveness among soul and body, in the particular case of phantom limb pain, the cause of sensation cannot be ascribed only to the brain.

Rauzy, Jean-Baptiste (Université Paris-Sorbonne)

Presumption and Presumptivism

This talk focuses on the use of presumption as an epistemic modality.

I believe that presumption – based on two essential characteristics: a context of limited information and a reversal or limitation of the burden of proof– is well suited, perhaps best suited, to the role that it often plays in epistemology and metaphysics with respect to convention and even to fiction. I call “presumptivism” the extension of a judicial practice in metaphysics and epistemology in order to explain the epistemic access to certain entities within ontology. This approach can be seen as part of Leibniz’s legacy. The presumptivist, like the fictionalist, believes that sometimes it is reasonable to accept some content although it is not true and cannot, strictly speaking, be the object of a belief. They both believe—or at least hope—that the important cases for which a paradigmatic modality is usefully introduced, concern discussions that commit one to the existence of questionable or disputed entities.

Presumptivism can also be set forth as a position standing in relating to problematic justifications. The example I will discuss is that of justification for modus ponens.

Ott, Walter (University of Virginia)

The problem of provisos among the moderns

Throughout the modern period, some philosophers seek to displace efficient causation as the source of explanation in natural philosophy. In its stead, they erect a new foundation: laws of nature. In recent decades, Carl Hempel, Nancy Cartwright, and Marc Lange have presented the defender of laws of nature with some unattractive options. Taken in

their unqualified form, the laws of special sciences and arguably some physical laws are either false or vacuous. Newton’s law of gravity, for example, predicts how bodies will behave, but only when they are not subjected to other forces, such as electrical charge. In response, it’s natural to add a qualifier: a *ceteris paribus* clause. The law of gravity says that things will behave thus-and-so, other things being equal. The problem is that this qualifier produces an analytically true claim: it amounts to saying, things will behave thus-and-so, unless they don’t. Alternatively, one could try to build in every possible defeater, to make the clause substantive. In practice, of course, this is impossible; and even if it were possible, one would arrive at a law so specific it applied only to a handful of cases.

It’s striking, then, that those modern philosophers treading the new ‘way of laws’ never discuss this problem. I examine two test cases: René Descartes and George Berkeley. Descartes doesn’t face the problem of provisos because his laws have only dispositional force. This move has recently come under fire, since it seems to push the problem back: after all, the manifestation of a disposition is subject to its own host of qualifying conditions. I argue that this objection doesn’t tell against Descartes, since on his view the laws of nature are features of the divine will. They are, in other words, intentions, and intentions always, and unproblematically, imply a set of *ceteris paribus* conditions.

For his part, Berkeley tacitly offers a very different solution. On his view, or so I argue, the laws of nature are not in fact true propositions. They are instead the axioms of the best system and only generate accurate predictions when applied in tandem. Berkeley’s rejection of what Cartwright calls the ‘facticity’ of laws allows him to circumvent the problem of provisos.

In short, I argue that the whole issue of *ceteris paribus* laws does not arise for these two thinkers because of their very different ways of conceiving of laws of nature. Whether either of these ways is at all plausible in its own right is a further question I hope to answer.

Lyssy, Ansgar (Ludwig-Maximilians-Universität München)

***Cosmodicy* – J. H. Lambert on Cosmic Order and Divine Reason**

In his *Cosmological Letters* (1761) Lambert aims at justifying the nature of the cosmos: It seems to be non-ideal on the first glimpse, as it seems to lack mathematically precise regularities and appears to be threatening and harmful to human beings. This is not the case, Lambert argues, as all deviations from the mathematical model and from natural regularities serve a purpose for life, especially human life; the universe is a place made for life, not death. The *Letters*, thus, are essentially a *cosmodicy*: A justification of the cosmos as a fundamentally good and orderly place, despite appearances to the contrary. Lambert strives to reconcile the Christian presumption of a fundamentally benevolent creator of the world with the scientific questions of his day. And he does so by employing his notion of a system to cosmology, thereby relating all parts functionally to a greater whole and a common end, which they serve.

For this purpose, Lambert employs teleological explanations to the cosmos, which are explicitly modeled on the teleological ideas developed by Leibniz and Maupertuis. Nonetheless, Lambert's methodological premise falls short of his ambitions. His account of the cosmos fails to emulate his two predecessors, who propose a much more mathematicised and rather formal teleology, which on its most basic level concerns the optimization of nature, without immediately

evoking intentions and purposes. Lambert's explanations, however, refer to goals and ends purposively implemented by an intelligent creator, falling back on earlier, pre-modern accounts of teleology.

Kochiras, Hylarie (National and Kapodistrian University of Athens)

Dimensionality by Force

In Newton's natural philosophy, forces and powers not only drive nature's processes, they express some of his greatest creativity. As causal motors in his gravitational theory, impressed forces drive the celestial bodies, they bind particles in his theory of composition, and they effect light reflection in an *Opticks* hypothesis. And while his *vis inertiae* is an agent cause, and thus drawn from earlier ideas, Newton embeds that complex power of resistance in his innovative theory, by making it the causal ground of his laws of motion. What some commentators have identified as Newton's dynamical concept of body reflects all of that originality, being characterized as it is by the laws arising from the *vis inertiae*, and allowing dimensionless point masses to count as bodies. In contrast to that, Newton's other concept of body—the extension based or dimensional concept that is apt for his investigations of atomism and his composition theory—might seem rather outdated. Indeed, some commentators have argued that this concept is fundamentally Cartesian, crafted from Cartesian geometric figures made real. I will argue that in fact, Newton's dimensional concept is in its own way highly innovative. During his undergraduate days, he had already struck upon an entirely new way of conceiving of material dimensionality, one wholly at odds not only with Aristotelian ideas but also with Boylean solidity and actualized Cartesian geometric figures: it could be established by forces. Furthermore, while the commentators identifying two concepts in Newton's thought are quite right that they

conflict at the level of physical theory, Newton's conception of material dimensionality's basis gives him a means of reconciling them at the metaphysical level.

McDonough, Jeffrey (Harvard University)

Not dead yet: Teleology and the "scientific revolution"

Scholars of the early modern period have devoted much effort to investigating attacks on teleology by thinkers such as Bacon, Descartes and Spinoza. Most natural philosophers in the early modern era, however, remained deeply committed to teleology. This lecture will explore the complex and varying attitudes displayed towards teleology by three leading figures of the "scientific revolution." It is hoped that a closer consideration of how teleology was employed and developed in the works of William Harvey, Robert Boyle and Pierre Maupertuis will help to shed light on the ways in which teleology continued to thrive and evolve with the development of the new science.

Fasko, Manuel (Universität Zürich)

Causes as Signs and Reasons as Causes – George Berkeley's Distinction Between Physical and Spiritual Cause

One way to capture the difference between cause and reason in contemporary philosophy is to highlight their different relations – causes to effects and reasons to actions. While there is a notable debate whether reasons are causes there seems to be consensus that effects (necessarily) follow causes while the connection between reasons and actions is somewhat shaky. In my paper will explore Berkeley's notion of

causation, which dissents notably from the contemporary debate since he holds causes to be signs and reasons to be causes.

Early in his writings Berkeley remarked in his notebook (PC) that "We must carefully distinguish betwixt two sorts of Causes Physical & Spirituall" (PC 855). One aim of the paper is to clarify what spiritual and physical causes are – whereby the latter are not really "physical" – in today's sense – at all. As Berkeley argued in his Principles of Human Knowledge (P) there exist only spirits and ideas (P §§ 1-3). Accordingly "physical causes" are ideas and therefore immaterial.

Although Berkeley's claim about the physical world would warrant a separate paper, it won't be subject to discussion since my paper won't focus on Berkeley's immaterialist ontology but his notion of causation. More specifically – and this is the second goal of the paper – I will argue that for Berkeley physical causation, i.e. the relation between cause and effect is, what I will call, a semiotic relation.

But contrary to what one may expect the reason for Berkeley's interesting notion of causation isn't his (notorious) immaterialism but his strict empiricism – or so I will argue. Even before Hume formulated the problem of induction Berkeley already noted that the supposed necessity between cause and effect is not observable with our ordinary senses. All we ever perceive are sequences of different ideas, which are passive and accordingly cannot be said to cause anything at all – "one idea [...] cannot produce, or make any alteration in another" (P § 25). Hence only spirits can be said to cause something by willing something to happen (P § 28).

In this sense only reasons – or as Berkeley would say "volitions" (ibid.) – are causes. Obviously, this is a difficult claim with even more difficult consequences. Especially it is rather unclear how Berkeley can account

for human agency at all as will be made clear at the end of this first section.

The second section will not be dedicated to solving Berkeley's problem of human agency but a different one. Because even if Berkeley's immaterialism and his distinction between active spirits and passive ideas is granted it remains puzzling how Berkeley can account for the fairly constant course of nature and does he deny that the laws of nature hold?

The answer to these questions presupposes a more detailed discussion of the semiotic relation between cause and effect. Broadly speaking there is a functional similarity between cause & effect with a sign & the thing signified in language. But the analogy goes even further since nature in general for Berkeley is a discourse with God and the laws of nature its grammar (P §§ 108-110). A claim to be clarified in the remainder of the paper.

Brading, Katherine (Duke University)

The Force of Bodies

How do bodies act on one another? I show the ways in which this was an important and unsolved problem in the wake of Newton's *Principia*, and outline the two approaches to solving it that were available at the time. The first tackles the question "What is the nature of bodies such that they are capable of acting on one another?". I argue that this question is central to Émilie Du Châtelet's 1740 *Foundations of Physics*. This text underwent significant revisions immediately prior to publication, in which Du Châtelet introduced metaphysical commitments drawn from Leibniz and Wolff. I argue that these were introduced precisely because Du Châtelet believed they enabled her to

address the problem of bodily action, which had long troubled her, and to provide a causal explanation of bodily action. The second approach to the problem addresses the question "What are the rules by which bodies act on one another?". I explain how answering this might be thought to answer "How do bodies act on one another?", and the extent to which it succeeds. I argue that both approaches face serious difficulties, and try to make clear the far-reaching philosophical implications of this conclusion.