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Force and Mind–Body Interaction

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The history of philosophy is in part a history of philosophical problems and positions. The history of philosophy in the seventeenth century includes among its problems that of the relation of the mind to nature. Recent work investigating this problem has formulated it through questions concerning the relation between mental activity and laws of nature. One such question has been whether activity of minds would violate the laws of nature.¹

In constituting our understanding of past philosophical problems, we are constantly tempted to use later, sometimes clearer, statements of problem to shed light on earlier philosophical positions. In the case of the mind's relation to nature and the mind-body problem, the notion that a Laplacean determinism conflicts with free will, and Kant's notion in the Third Antinomy that free will and determinism (complete lawfulness of nature) are at odds, have been relied upon in seeking to understand the positions of Descartes and Leibniz. In so doing, certain presuppositions have been adopted concerning what can count as a "law of nature," what scope such laws must have, and whether the free activity of a mind can at the same time (without Kantian antinomy) fall under a law of nature. In particular, a common supposition has been that since minds—as conceived by dualists such as Descartes or monadists such as Leibniz—are not themselves part of nature, their effects on other things would have to be supernatural, or extranatural, or in violation of nature, rather than just another natural force to be taken into account.

I want to call into question the notion that seventeenth-century authors such as Descartes and Leibniz straightforwardly conceived the mind as something "outside" nature. Descartes indeed did regard matter as distinct from mind, but the question then remains as to whether he equated the natural world, and the world of laws of nature, with the material world. Similarly, Leibniz distinguished a kingdom of final causes (pertaining to souls) and a kingdom of efficient causes (pertaining to bodies and motions), but the question remains

as to whether he equated nature with the second kingdom alone, or included both kingdoms within nature.

The use of distinctions and problem statements from later philosophy to interpret an earlier philosophy cannot be avoided. Nor should we want to avoid it always. At the same time, we should be self-conscious in our retrospective use of later terms and concepts to characterize earlier works. Often, what seems most obviously a useful characterization acts as a distorting lens, which masks questions of interest about past materials. Consider talk of the “history of science” as including Galileo, Descartes, and Newton. These authors all used Latin terms etymologically related to the English word “science.” But none of them recognized a notion of “science” so-called that would be equivalent to the group of natural sciences (e.g., physics, chemistry, biology) that we in the early twenty-first century intend to designate by that term. Rather, they considered science to include any body of knowledge known through principles, and so to include mathematics and theology.

In the case of the term “science” the effect of backward projection may be comparatively harmless. But consider some other “obvious” classifications and assumptions. Historians and philosophers of science often speak of Galileo, Descartes, and Newton as important figures in the “history of physics” in the seventeenth century, largely because of the various laws of motion they developed. This classification, and the focus on laws of motion, is problematic on several counts. First, in the early seventeenth century “physics” was standardly conceived as the science of nature in general. On the still prominent Aristotelian conception, “physics” included the *De anima* writings and hence included discussion of the sensory and cognitive capacities of humans and other animals (what was then, and later, called “psychology”). To treat the history of seventeenth-century physics as the history of the investigation of the properties and laws of inanimate matter and its motion masks the question of how it came to be, by the late eighteenth or early nineteenth century, that physics was regarded as the discipline dealing with matter conceived under mechanical laws.² Second, by ignoring the Aristotelian use of “physics” to include psychology, and the attendant inclusion of cognitive activity within nature, this way of describing things avoids the question of whether Descartes and others thought of physics in the same way, and whether they included mind in or excluded it from the natural world as they conceived it. One reason that writers

from the latter part of the twentieth century may have been insensitive to such questions is that they have tacitly adopted the view that the dualism of Descartes, or the soul-like monads of Leibniz, are incoherent and *wrong on the face of things*. That is, from our later perspective we may find it natural, as philosophical readers, to see Descartes and Leibniz as having placed the mind outside nature, because on that view at least they can be attributed an apparently coherent conception of nature as equated with body and the laws of motion governing body. But this natural trend of thought should be resisted. For no matter how “obviously” wrong we take Descartes or Leibniz to have been in their mind-body ontologies, our first job as historians of philosophy is to understand and characterize their positions, and that requires that we understand how *they* thought about questions such as the place of mind in nature, and the interaction of minds with bodily processes.

MINDS AS “INTERFERING” WITH NATURE

The conception that minds are outside of nature was expressed in a variety of forms, explicitly and implicitly, by twentieth-century historians of philosophy. A clear statement comes from John Hermann Randall, Jr.:

What becomes of man in the Cartesian world? Descartes was hardly deeply concerned: he was too much fascinated by nature. Man’s body is a beautiful machine, a complex assemblage of billiard-balls. But all the nonmathematical qualities taken out of nature had to go somewhere: they were located in the soul.³

A similar conception can be found earlier in E. A. Burtt.⁴ These are “old” sources, and one might object that they have been surpassed. Yet it often happens that even though such sources are questioned or rejected on some counts, some or all of their general framing conceptions—such as the present one, concerning the place of mind in nature—are absorbed and repeated

without comment. In my view that is indeed what has happened in the present case.

If the mind is outside nature, and if it nonetheless interacts with nature (through the body) or is causally efficacious in ways that affect the motions of bodies, then an apparent problem arises. First, someone who endorses mind-body interaction, as Descartes apparently did, would be positing an extranatural or even supernatural influence that is exhibited with every human action. But seventeenth century metaphysicians typically were keen to reserve supernatural intervention for special cases. Second, if minds can alter the direction of motion, then they would be, or at least would seem to be capable of, interfering with the lawfulness of nature. Third, if minds exhibit free-will, then their interventions would not themselves be subject to law, so that the lawfulness and predictability of nature would be abolished.

The purposeful action of minds would, in this view, be antithetical to the lawfulness of the nature itself, and thus, one presumes, inimical to the natural philosophical aims of authors such as Descartes and Leibniz. We can sum up these problems as follows:

- (1) Minds are outside nature.
- (2) Minds don't follow natural laws.
- (3) Minds exhibit free will.

If we take the problem to arise from the causal efficacy of minds in interacting with matter, then these can be seen as problems that arise from conceiving minds as extranatural and unlawful forces which interfere with nature.

DESCARTES, LAWFULNESS, AND CONSERVATION

The Aristotelian conception of the natural world posited a stark contrast between the area near the Earth and the unchanging heavens above the sphere of the moon. By contrast, Descartes posited a single, unified material world, in which the movements of matter are governed by three laws of motion. These three laws specified that bodies remain in their state of rest or motion unless something acts upon it; that a body in motion moves in a straight line unless

something diverts it; and that colliding bodies preserve the total quantity of motion in their subsequent motions. This third law built upon Descartes' stated principle, in *Principles* II.36, that God always preserves the quantity of motion in the material universe:

[God] created matter, along with its motion and rest; and now, merely by his regular concurrence, he preserves the same amount of motion and rest in the material universe as he put there in the beginning.⁵

The quantity of motion is calculated by multiplying the volume of a body times its speed. God's preservation of the quantity of motion is a manifestation of his immutability. The quantity "conserved" is not a vector quantity, since direction does not matter: in Descartes' method of calculation, a change in direction causes no change in the quantity of motion. Still, changes of direction are "determined" by the orientations of the surfaces of colliding bodies.

Descartes' invocation of this "conservation law" can seem as if it is a kind of prescient foreshadowing of a Laplacean universe in which matter marches on according to fixed laws, and so everything is determined. In such a conception, one might feel that any deviations from the "preserved" quantity must come from outside nature, hence be supernatural, and a violation of the order of nature. Our question here must be whether Descartes actually proposed or assumed such a conception of nature and nature's laws. This includes the question of whether God assured a constant quantity of motion in matter no matter what, or merely preserved a constant quantity insofar as his own causal activities were concerned.

Already in stating the principle that God preserves the quantity of motion, Descartes allowed for exceptions. In *Principles* II.36 he said:

Now there are some changes whose occurrence is guaranteed either by our own plain experience or by divine revelation, and either our perception or our faith shows us that these take place without any change in the creator; but apart from these we should not suppose that any other changes occur in God's works, in case this suggests some inconstancy in God. Thus, God imparted various motions to the parts of

matter when he first created them, and he now preserves all this matter in the same way, and by the same process by which he originally created it; and it follows from what we have said that this fact alone makes it most reasonable to think that God likewise always preserves the same quantity of motion in matter.⁶

This passage in its context is likely to strike the modern reader as odd. It says that God preserves the quantity of motion, and in the subsequent articles this act of conservation is said to be the basis for various laws of motion. But the passage allows exceptions to the rule that all motions or changes in motion arise from God's preserving activity; in one case, it allows for various changes in bodies, which "experience" "renders certain," but which are "apart from" the motions that God manages in his immutable way. We are used to thinking of laws of motion as universally applicable to all events in nature, and as completely governing the outcome. So how can there be both a law of nature maintained by God, and some exceptions?

As if to provide an answer to this question, Descartes discussed other possible causes of the motions of bodies a few articles hence, in *Principles* II.40. Having just finished his exposition of the third law of motion, he went on:

All the particular causes of the changes which bodies undergo are covered by this third law, or at least those causes which are themselves corporeal. I am not here inquiring into the existence or nature of any power to move bodies which may be possessed by human minds, or the minds of angels.⁷

Perhaps the exceptions made manifest by experience are cases in which we humans alter the motions of bodies as a result of a mental decision to move our bodies. And perhaps the other exceptions, from revelation and attested by faith, are ascribed to angels. If so, then it would seem that God might simply preserve that same quantity of motion in matter in so far as he has the power to move bodies (or to create them in successive positions, if one sees God's preserving act as a series of creative acts), while humans and angels also add to the total mix of motion, through their own power to move bodies.

In the case of angels intervening, we presumably would have an extranatural power. And Descartes indicates that here we must rely on revelation and faith for our belief that such interventions occur. But other instances are manifest in our experience. Should these cases, in which the mind directly causes motion in the body, be seen as instances of extranatural influence? That depends of course on whether Descartes thought of minds, and mind-body interaction, as natural beings and processes, or placed them “outside” nature.

If the former, if he saw mind and mind-body interaction as natural, then we might expect Descartes to regard the mind as another force that interacts with bodies to determine their motions. And in fact he uses just such language in a letter to Elizabeth from May 1643, and so written while he was still working on the *Principles*:

With respect to the soul and body together, we have only the notion of their union, on which depends the notion of the force the soul has to move the body, and that the body has to act on the soul, in causing its sensations and passions.⁸

Here he characterizes the power of the soul to move the body as a “force” (*force*). The standard English translation of Descartes’ letters renders the word as “power,”⁹ but the effect is the same. Descartes appears to treat the mind as simply another causal determinant of motions in the body. In this case, if a mind caused a change in the quantity of motion by altering the motion of a body, this would not be a violation of the general laws of nature. Rather, it would be a matter of an interaction among various principles: God’s preservation of the quantity of motion *he* put into matter, and the mind’s local addition of motion to matter, which might add or subtract from the total quantity. On this view, these are separate principles having separate causal origins, but which may interact.¹⁰

Let us suppose for the moment that Descartes did not regard the intervention of the mind to change the motion of the body (or the brain) as extranatural. We might then expect him to treat mind-body interaction as simply another lawful interaction in nature. There is some evidence that

Descartes saw things this way, including his discussion in *Dioptrics* VI of the “institution of nature” by which mind is adjusted to body, and his “physical” or “natural philosophical” discussion of mind-body interaction in the *Passions*.¹¹ If we look to Descartes’ followers, there is considerable that mind-body interaction and its laws were considered by them to be “physical” or “natural” laws, that is, laws such as might be included in physics considered as the science of nature.¹²

LEIBNIZ AND NATURAL LAW

Dan Garber has analyzed the question of mind-body relations and laws of nature in Descartes and Leibniz. He acknowledges that Descartes would seem to allow for violations in the conservation of quantity of motion. To that extent I am in general agreement with his results, though I disagree with his suggestion that Descartes did not consider minds to be an integral part of the world.¹³ But Garber goes on to ascribe a certain attitude toward Descartes and the laws of motion to Leibniz. He describes Leibniz as seeking to avoid a position such as Descartes’, in which minds influence bodies, because the position would involve a “miraculous” intervention into nature by ordinary minds. Garber thus attributes to Leibniz the view that minds would be doing something *supernatural* if they caused violations in the laws of motion that govern bodies apart from the influence of minds. As Garber sees it, in Leibniz we have a proto-version of the problem of universal, deterministic laws which would be violated by human actions if human beings could actually affect the world causally. Hence, Leibniz’s doctrines of monadism and pre-established harmony were prescient attempts to solve the Laplacean problem of mechanical determinism and free-will. It should be to Leibniz that we owe the conception of the complete lawfulness of nature, immune from intervention through human will.

Garber stakes his main argument on the interpretation of a passage from Leibniz’s “Considerations on Vital Principles and Plastic Natures” of 1705.¹⁴ There Leibniz gave his own analysis of Descartes’ laws of motion in relation to the problem of mind-body interaction. Leibniz suggested:

Descartes very well recognized that there is a law of nature by which the same quantity of force is conserved, though he made a mistake in applying this principle by confusing quantity of force with quality of motion; he therefore thought it unnecessary to give the soul the power of increasing or diminishing the force of the body but only that of changing its direction by changing the course of the animal spirits.¹⁵

The idea is that because Descartes held his particular conception of quantity of motion, according to which changes of direction do not alter the quantity, he had no reason to allow the soul to increase the “force” or quantity of motion of an individual body; he could account for the soul’s power to direct the motion of bodies by having the soul change the direction of the animal spirits at the pineal gland.

There is no textual evidence that Descartes himself ever reasoned in this way. So unless Leibniz had access to texts now lost (not an impossibility), it seems that he has provided a diagnosis of Descartes’ position as we know it. Our problem is then to see how he reasoned to his diagnosis. That is, what assumptions about Descartes’ aims, and what assumptions about the notion of “laws of nature,” did Leibniz attribute to Descartes in order to come to the conclusion that Descartes felt inclined to restrict to the soul’s influence to mere direction of matter, so as not to change the quantity?

We can get some help on this question by considering the continuation of the above passage. Leibniz predicted:

If this new law of nature which I have demonstrated had been known in Descartes’ day, according to which not only the same quantity of total force of bodies in interrelation is conserved but also their total direction, he would undoubtedly have been led to my system of pre-established harmony, for he would have recognized that it is just as reasonable to say that the soul does not change the quantity of the direction of the body as it is to deny to the soul the power of changing the quantity of its force, both being equally contrary to the order of things and the laws of

nature, since both are equally inexplicable. Therefore souls or vital principles, according to my system, change nothing in the ordinary course of bodies and do not even give God the occasion for doing so.¹⁶

The last remark rules out the system of occasional causes which Leibniz attributed to some “Cartesians.” The real work in the passage is done when Leibniz says that under his system, Descartes would have had to see that both change in direction and change in quantity are unacceptable, “both being equally contrary to the order of things and the laws of nature, since both are equally inexplicable.” Garber reads the point about violating “laws of nature” as one about violating universal laws of motion, and therefore attributes to Leibniz a view that alteration of bodily motion by the mind would be a violation of nature. According to Garber, Leibniz would see such influence, arising through interaction, as a “perpetual miracle.”¹⁷

Thus far Leibniz has not said that the problem with Descartes’ system was that it relied on miracles. Rather he has said that the system is contrary to the order of things and laws of nature, *since* it is inexplicable. So the unintelligibility of mind-body interaction provides another possible basis for Leibniz’s diagnosis. That is, mind-body interaction might be ruled out solely or primarily on grounds of its unintelligibility.

Garber appeals to the continuation of the passage I have been quoting to support his characterization of Leibniz. Leibniz describes his “system” as follows, and then compares it with Descartes’ and the occasionalists’:

The souls follow their laws, which consist in a definite development of perceptions according to goods and evils, and the bodies follow theirs, which consist in the laws of motion; nevertheless, these two beings of entirely different kind meet together and correspond to each other like two clocks perfectly regulated to the same time. It is this that I call the theory of *pre-established harmony*, which excludes every concept of miracle from purely natural actions and makes things run their course regulated in an intelligible manner. Instead of this, the common system has recourse to absolutely inexplicable influences, while in the system of

occasional causes God is compelled at every moment, by a kind of general law and as if by compact, to change the natural course of the thoughts of the soul to adapt them to the impressions of the body and to interfere with the natural course of bodily movements in accordance with the volitions of the soul. This can only be explained by a perpetual miracle, whereas I explain the whole intelligibly by the natures which God has established in things.¹⁸

Here too Leibniz does not directly say that Descartes' system requires miracles. So he does not treat mental influence as extranatural or supernatural, *pace* Garber. Rather, he says that the system of occasional causes requires a miracle, because it requires moment to moment interference by God. The common system (of mind-body interaction) is indeed contrasted with a system in which things are regulated "in an intelligible manner," and this could I guess be read as saying that in the common system the mind's intervention violates the order of nature. But the direct and specific fault attributed to the common system is that it "has recourse to absolutely inexplicable influences." These inexplicable influences are the very influence of mind on body (and body on mind). Leibniz is here raising a standard objection against mind-body interactionism (one also raised by Spinoza), that it is impossible to understand how the two different substances could interact.

The passage contains some other indications of Leibniz's position, which provide evidence against the view that he considered minds or souls to lie outside the "laws of nature" and "the order of things." It says that "souls follow their laws, which consist in a definite development of perceptions according to goods and evils." Below I will offer evidence that Leibniz considered the laws of souls to be natural laws. Consequently, if Leibniz had allowed mind-body interaction, the result would not be a miracle, but the interaction of two systems of natural laws. Still, he has characterized the "common system" of mind-body interaction as contrary to a system in which things are "regulated in an intelligible manner." What we need to know is how mind-body interaction would be opposed to intelligible regulation. My suggestion is that beyond the problem of mind-body interaction being causally inexplicable, it fails to offer any explanation for the overall adjustment of the world of bodies to the world of

souls. This is not because souls interfere with what bodies would have done otherwise; rather, it is because the intervention of individual souls into the world could not achieve the kind of order in the world that Leibniz thinks is there—an order he thinks he can explain through his system of pre-established harmony. The order in question is the moral order of the world, which Leibniz conceives as an order between two *natural* realms, the kingdom of souls and the kingdom of bodies. If interaction could be made to work metaphysically, it would explain why the body moves when the soul commands it; but it could not explain why the entire system of bodies is organized so as to respond to the moral quality of the choices that led the mind to initiate the bodily motions that it did.

Leibniz explained his position in the *Monadology* of 1714. First, he reaffirmed the notion that souls act according to laws:

79. Souls act according to the laws of final causes, through appetitions, ends, and means. Bodies act according to the laws of efficient causes or of motions. And these two kingdoms, that of efficient causes and that of final causes, are in harmony with each other.¹⁹

Souls follow laws of final causes. Appetition refers to the perception of goods and evils from the earlier passage. Ends may involve the perception of the good through reason, and means-ends reasoning could be brought to bear to seek good and avoid evil. The laws of final causes are the laws of choice of action. Leibniz continued, further on:

87. Since earlier we established a perfect harmony between two natural kingdoms, the one of efficient causes, the other of final causes, we ought to note here yet another harmony between the physical kingdom of nature and the moral kingdom of grace, that is, between God considered as the architect of the mechanism of the universe, and God considered as the monarch of the divine city of minds. 88. This harmony leads things to grace through the very paths of nature. For example, this globe must be destroyed and restored by natural means at such times as

the governing of minds requires it, for the punishment of some and the reward of others.²⁰

Here, I believe, we have the key to the order that would be missing if we didn't have pre-established harmony (as opposed to interaction). It is the global adjustment of the two "natural kingdoms," the kingdom of souls, regulated by ends, and the kingdom of bodies, governed by laws of motion. Because God knows the laws of souls, he is able to foresee how souls will choose across eternity. By picking the right sort of laws of motion and the right initial conditions, he can then produce a material world that runs in pre-established harmony with the mind's choices, and which also produces morally proper sequence of natural events, doling out rewards and punishments.²¹

Both of Leibniz's kingdoms are law-governed. Indeed, even though he held that minds are "metaphysically free," Leibniz still considered their choices to be law-governed, or determined. Even if minds could causally interact with the world, that interaction would not yield chaos, for the choices of minds are law-governed. Hence, for Leibniz, freedom is compatible with the lawful determination of the mind's choices. By contrast with the three problems concerning the mind's place in nature that we scouted in section 1, for Leibniz minds are natural, and freedom compatible with determinism. His position on the three problems can be summarized as follows:

(1') Minds are natural.

(2') Minds follow deterministic natural laws.

(3') Minds exhibit free will, which is determined as in (2).

The kingdom of ends is a natural kingdom, and the laws of minds are natural laws, according to which will is determined.

KANT AND THE NATURE/FREEDOM SPLIT

The relations among freedom, determination, and necessity have long been discussed. The form under which the question is often discussed today, of a possible conflict between freedom and the laws of nature, arose to prominence

during the eighteenth century. In my view a primary author of that way of framing the problem was Immanuel Kant, who himself saw the problem as arising because he was unable to accept, or at least to claim knowledge of, the explanation that Leibniz offered for how freedom could be given a moral context in which to operate in a law-governed world. That is, he did not see how, if minds followed their own moral laws, the world could be expected to cooperate by yielding appropriate moral outcomes.

In the *Metaphysics of Morals*, Kant explained the problem as follows:

Such a kingdom of ends would be actually realized by means of maxims conforming to the canon which the categorical imperative prescribes to all rational beings, *if they were universally followed*. But although a rational being, even if he punctually follows the maxim himself, cannot reckon upon all others being therefore true to the same, nor expect the kingdom of nature and its orderly arrangements shall be in harmony with him . . .²²

Unlike Leibniz, the metaphysically skeptical Kant was unwilling to claim to know that God would arrange a harmony between the kingdom of nature and the kingdom of ends. And like Leibniz, Kant considered the suggestion of a real influence of minds on matter to be unintelligible.²³ Hence, he left the world of matter, now seen as the kingdom of nature, to run on its own according to its own laws. And he posited a second realm of freedom, not subject to determinism. Kant brought the modern problem of freedom and determinism, as a problem of reconciling undetermined freedom with laws of nature that determine all human bodily motion, to prominence through its statement in the Third Antinomy of the *Critique of Pure Reason*.²⁴

Although Kant's division separated what Leibniz had considered two *natural* kingdoms, in that Kant separated the kingdom of ends from the kingdom of nature, he did not completely remove the mind from nature. For Kant in fact considered that psychology, if it could become a science, would be a branch of physics. He thus retained the Aristotelian classification in which psychology is part of physics and the mind is natural.²⁵ But he separated the moral

dimension of mind from the mind as a natural thing, subject to the law of cause. He thus started a trend toward taking the mind out of nature. This trend reached its peak in the behaviorism of the first half of the twentieth century. But no matter whether we now agree with the trend or would like to reverse it, we should not force its perspective back onto Descartes and Leibniz. For then we would fail to see how they differ from later positions, and so fail to appreciate the question of how the later positions arose from, or in spite of, those of Descartes and Leibniz.

NOTES

¹ Daniel Garber, "Mind, body, and the laws of nature in Descartes and Leibniz," *Midwest Studies in Philosophy*, 8 (1983): 105-133.

² Gary Hatfield, "Was the Scientific Revolution really a revolution in science?" In *Tradition, Transmission, Transformation*, ed. by Jamil Ragep and Sally Ragep, Leiden, Brill, 1996, pp. 489-525.

³ John Hermann Randall, Jr., *The Career of Philosophy*, vol. 1, New York, Columbia University Press, 1962, pp. 390-1.

⁴ E. A. Burt, *Metaphysical Foundations of Modern Physical Science*, rev. edn., London, Routledge & Kegan Paul, 1932, ch. 8.

⁵ René Descartes, *Philosophical Writings*, trans. by John Cottingham, Robert Stoothoff, Dugald Murdoch, 2 vols., Cambridge, Cambridge University Press, 1984-85, 1:240.

⁶ *Ibid.*, 1:240.

⁷ *Ibid.*, 1:242 (emended).

⁸ Descartes, *Oeuvres*, ed. by Charles Adam and Paul Tannery, new edition, Paris, Vrin, 1964-76, 3:665.

⁹ Descartes, *Philosophical Writings, Volume 3: Correspondence*, trans. by John Cottingham, Robert Stoothoff, Dugald Murdoch, Anthony Kenny, Cambridge, Cambridge University Press, 1991, p. 218.

¹⁰ Here I leave aside the question of whether, in the end, for Descartes all causation must be referred to God, resulting in occasionalism, on which, see Gary Hatfield, "Force (God) in Descartes' physics." In *Descartes*, ed. by J. Cottingham, Oxford: Oxford University Press, 1998, pp. 281-310, on pp. 306-7.

¹¹ Descartes, *Oeuvres, op cit*, 6:130; *Passions of the Soul*, trans. by Stephen Voss, Indianapolis, Hackett, 1989, p. 17.

¹² See Gary Hatfield, "Descartes' naturalism about the mental." In *Descartes' Natural Philosophy*, ed. by Stephen Gaukroger, John Schuster, and John Sutton, London, Routledge, 2000, pp. 630-658.

¹³ Garber, "Mind, body," *op cit*, p. 126.

¹⁴ G. W. Leibniz, *Philosophical Papers and Letters*, trans. by Leroy Loemker, Boston, Reidel, 1969, pp. 586-91.

¹⁵ *Ibid.*, p. 587.

¹⁶ *Ibid.*

¹⁷ Garber, "Mind, body," *op cit*, p. 121.

¹⁸ Leibniz, *Philosophical Papers, op cit*, p. 587.

¹⁹ G. W. Leibniz, *Philosophical Essays*, trans. by Roger Ariew and Daniel Garber, Indianapolis, Hackett, 1989, p. 223.

²⁰ *Ibid*, p. 224.

²¹ On Leibniz's conception of freedom and the compatibility of freedom with hypothetical (as opposed to metaphysical) necessity, see *ibid*, pp. 60-62.

²² Immanuel Kant, *Metaphysics of Morals*, trans. by T. K. Abbott, London, Longmans, 1909, p. 57.

²³ Kant, *Critique of Pure Reason*, trans. by Paul Guyer and Allen W. Wood, Cambridge, Cambridge University Press, 1998, pp. 436-438.

²⁴ Kant, *Critique, op cit*, Third Antinomy, pp. 484-485.

²⁵ See Gary Hatfield, "Empirical, rational, and transcendental psychology: Psychology a science and as philosophy." In *Cambridge Companion to Kant*, ed. by Paul Guyer, Cambridge, Cambridge University Press, 1992, pp. 200-227.