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Lecture 2
Leibniz the Radical Reactionary: First Steps

Last time I ended with a long quotation from a letter Leibniz wrote to Nicolas Remond in January 1714. In the course of that letter, he wrote:

> I discovered Aristotle as a lad, and even the Scholastics did not repel me; even now I do not regret this. After having finished the trivial schools, I fell upon the moderns, and I recall walking in a grove on the outskirts of Leipzig called the Rosental, at the age of fifteen, and deliberating whether to preserve substantial forms or not. Mechanism finally prevailed and led me to apply myself to mathematics. It is true I did not penetrate into its depths until after some conversations with Mr. Huygens in Paris. But when I looked for the ultimate reasons for mechanism, and even for the laws of motion, I was greatly surprised to see that they could not be found in mathematics but that I should have to return to metaphysics. This led me back to entelechies, and from the material to the formal, and at last brought me to understand after many corrections and forward steps in my thinking, that monads or simple substances are the only true substances and that material things are only phenomena, though well founded and well connected. [Leibniz to Remond, Jan. 10 1714; G III 606 (L 654-5)]

In this lecture I would like to begin the treck from mechanism to monads.

Before entering the path, though, let me begin with a brief reflection on why I'm taking the kind of genetic approach that I am in this lecture, tracing Leibniz's views from his early and less known writings. I began in the first lecture by remarking that Leibniz's views on the ultimate make-up of the physical word in terms of non-extended and mind-like monads are deeply puzzling. One hope is that we can make these metaphysical views more intelligible if we can start with a view that appears at least somewhat sensible to us, such as the mechanical philosophy, and show how, step by step Leibniz arrived at his mature views, we will be able to make his later view more intelligible to us. But I should confess to another motivation for proceeding in this way. In recent Leibniz scholarship there has been considerable controversy over what Leibniz believed and when he believed it. In particular, there has been some disagreement about whether Leibniz's monadological idealism was something that he held througout his life, or whether it was something that he only came to rather later in his career. Years ago I outlined a reading Leibniz's middle years, the period of the *Discourse on Metaphysics*, the Correspondence with Arnauld and other key texts, in which I claimed that Leibniz was not yet a monadological idealist during this period. Despite many attacks, I still believe that that reading is basically correct. Part of what I want to do here is expand and defend my reading. I want to show that when we understand what drove Leibniz to the doctrines of that crucial middle period, we will see that he had a rather different and non-idealist view of the world in mind at that time. This will be the argument of the next few lectures.

Nothing survives from this very earliest mechanist period, which would have commenced in 1661, if we are to believe what he wrote to Remond (which we probably

shouldn't). But by the mid- and late 1660s, there is ample evidence of Leibniz's interest in the new mechanical philosophy.[1] In one of his earliest writings, the "Confesio naturae contra aetheistis," "The Confession of Nature against Atheism," published in 1669 when Leibniz was only 23 years old, he writes:

> For through the admirable improvement of mathematics and the approaches which chemistry and anatomy have opened into the nature of things, it has become apparent that mechanical explanations—reasons from the figure and motion of bodies, as it were—can be given for most of the things which the ancients referred only to the Creator or to some kind (I know not what) of incorporeal forms. ["Confession of Nature against Atheism" (1669) A 6.1.489 (L 109-10)]

Most important in these very early years are two letters that Leibniz wrote to his mentor, Jacob Thomasius, in 1668 and 1669, in which he discusses the new mechanists.[2] Referring to such new philosophers as Descartes, Bacon, Gassendi, Hobbes, and Digby, Leibniz declares: "I maintain the rule which is common to all of these renovators of philosophy, that only magnitude, figure, and motion are to be used in explaining corporeal properties."[3] Like many of the new mechanists, Leibniz saw the nature of body as consisting of its broadly geometrical properties, extension and antitypy (impenetrability).[4] Though Leibniz was clearly an adherent of the new mechanical philosophy by the late 1660s, he at least professed to hold that mechanism is not in any way inconsistent with an adherence to Aristotelian philosophy. In the April 1669 letter to Thomasius, Leibniz emphasized over and over again that while the new philosophy may be inconsistent with the teachings of the schoolmen, it is fully consistent with the teachings of Aristotle himself; when properly understood, Leibniz argues, Aristotle too was a mechanist of sorts.[5] All in all, it seems best to view Leibniz in the context not of the radical mechanists, but the renovators or reformers, a group of seventeenth-century thinkers who were attracted to the new mechanical philosophy, but, at the same time,

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[1] The earliest evidence is in a letter Leibniz wrote to his mentor Jakob Thomasius on 16/26 February, 1666, where Leibniz discussed a question raised by Thomasius as to why Anaxagoras spoke of the possibility of black snow, and showed some acquaintance with mechanist doctrines of perception. See A IIi 4-5. In *De arte combinatoria* of 1666 there are a number of references to Hobbes' materialistic tract *De corpore*, and a brief discussion of atomistic explanations, with reference to the atomistic tracts of Gassendi and J.C. Magnenus. See A VIi 178, 183, 194, 216. In the theses for public disputation that Leibniz added to the work, he also included a claim that the four Aristotelian primary qualities, hot, cold, dry, and moist could be reduced to density and rarity, in the style of the earlier 17th Century mechanist, Sir Kenelm Digby; see A VIi 229, and Digby *Two Treatises in the one of which the Nature of Bodies in the other the Nature of Mans Soule is looked into in the way of discovery of the Immortality of Reasonable Soules* (Paris, 1644) bk I chapt. III-IV. Leibniz's theological writings from the years immediately following also show an acquaintance with and a sympathy for the new mechanical philosophy. For example, in the *De transubstantione* (1668?), Leibniz works within a framework within which the actions of mind are thought, and those of body are motion; see A VIi 508-21 (L 115-8). In the important *Confesio natura contra athiestas* (1669) Leibniz gives an explicit endorsement of the mechanist program; see A VIi 489 (L 109-10).

[2] A IIi no. 9 and 11.

[3] A IIi 15 (L 94).

[4] See A IIi 23 (L 101).

[5] A IIi no. 11 (L 93-103).

thought that it could be reconciled with the old Aristotelian physics. For Leibniz in this period—and, as we shall see, for the rest of his career—the view was that the true philosophy must somehow be a blend of the old and the new, a philosophy that was at the same time Aristotelian and mechanist.

These early indications of Leibniz's interest in the new mechanical philosophy are programatic and unsystematic. The first indication of any serious and systematic interest in natural philosophy on Leibniz's part isn't found until late 1669. In August 1669, in Bad Schwalbach with his then patron Baron von Boineburg, a scientific amateur and friend of Boineburg's showed Leibniz the recent publications of Christopher Wren and Christian Huygens about the laws of collision in the *Philosophical Transactions of the Royal Socity*.[6] This almost chance event begins Leibniz's serious engagement with physics. Leibniz began working on his own thoughts on motion and its laws, a series of notes that lead up to his first substantial writings in natural philosophy, the *Hypothesis physica nova* (HPN) or *Theoria motus concreti*, presented to the Royal Society of London in 1671, and the *Theoria motus abstracti* (TMA), presented to the French Academy of Sciences that same year.[7] Leibniz, then only 25 years old, quickly developed ambitions to join the premier scientific societies of his age. These two works were to be his admission tickets. (He did manage to become a member of the Royal Society just two years later, in 1673, which he maintained all his life, but it took him almost thirty years, until 1700 to get through the door of the Académie des sciences.)[8]

These works together constitute an interesting system of natural philosophy. In the TMA Leibniz gives an abstract account of motion, as the title suggests, an account of motion that is grounded purely in reason, so Leibniz claims. (It is, in fact, grounded as much in the natural philosophy of Thomas Hobbes as it is in reason; in an obvious way it is a varient on the system that Hobbes presented in his *De corpore* of 1655. More on this later.) But such an account of motion is radically in contradiction with the everyday experience of bodies and with the more exact experiments of other investigators. Leibniz's solution to this apparent inconsistency between reason and the world is a hypothesis about the state of the universe God created which, together with the abstract laws, yields something close to what it is that we observe in the world; this is the task of the HPN, or the theory of concrete motion, as the subtitle suggests, a theory of motion for *our* world.[9]

The heart of the abstract theory of motion that Leibniz gives in the TMA is an account of the collision of two bodies; for Leibniz, as for other mechanists, collision is the only way in which the motion of a body can be changed naturally. The account of impact is given in terms of the notion of a conatus, an indivisible, nonextended part of

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[6] Aiton p. 30.

[7] The notes are found in A VIii 157-218; the HPN and TMA are found in that same volume. The HPN and TMA are also found in GM VI and G IV, though there are some confusing differences in the numeration of the sections. The alternative title 'Theoria motus Concreti' is not found on the title page of the HPN, but on the first page of the text.

[8] See Aiton pp. 48, 218, 244, 248.

[9] See A VIii 223. For a fuller account of these writings, see A. Hannequin, *La première philosophie de Leibnitz*, in Hannequin, *Études d'histoire des sciences et d'histoire de la philosophie* (Paris: Félix Alcan, 1908), vol. II, pp. 17-224, esp. pp. 59-148.

motion, the beginning or end of motion, as he puts it.[10] Leibniz constructs his abstract theory of motion on the conviction that the outcomes of collisions are determined by simply combining the instantaneous motions (conatus) of the two bodies at the moment of collision; body as such offers no resistance to motion and so the mass or size of the bodies in question plays *no role whatsoever* in the outcome of a collision. As Leibniz put it in the HPN, "all power in bodies depends on the speed."[11] If two bodies with unequal speed collide, then, Leibniz argues, the the two will move together after the collision with a speed which is the difference between the two, and in the direction of the faster. In particular, if a moving body A hits a body B at rest, then they both move off in the direction the body A has, no matter how small A is, and no matter how large the resting B might be; in this case, the body B offers no resistance whatsoever to being set into motion. When the two speeds are equal, then "the directions of both will be destroyed, and a third will be chosen intermediate between the two, the velocity of the conatus being conserved," a conclusion that Leibniz argues is "the peak of rationality in motion," a conclusion that he justifies by appeal to the principle that "there is nothing without a reason," very likely the first time that Leibniz appealed in print to this most fruitful of his principles.[12] An interesting special case of this is when two bodies with the same speed collide directly. In this case, both come to a halt, in violation of the Cartesian conservation principle, in accordance with which the total quantity of motion (size times speed) is conserved in the world in general and in every individual collision.[13]

These laws of motion, reasonable as they might be in the abstract, fit very poorly with the world we see around us, as Leibniz knew; in particular, the bodies of our world do seem to offer resistance to being set into motion. In the HPN these abstract laws are reconciled with experience through an hypothesis about the makeup of the world. As his earlier writings might suggest, the spirit behind the HPN is thoroughly mechanistic. Leibniz writes:

> I agree completely with the followers of those excellent gentlemen, Descartes and Gassendi, and with whomever else teaches that in the end, all variety in bodies must be explained in terms of size, shape, and motion.[14]

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[10] A VIii 264-5 (L 139-40); Loemker's otherwise fine translation should be treated with extreme caution in these passages. Leibniz is here especially indebted to Hobbes. See Willy Kabitz *Die Philosophie des jungen Leibniz* (Heidelberg: Carl Winter,1909) and Howard Bernstein "*Conatus*, Hobbes, and the Young Leibniz," *Studies in History and Philosophy of Science* 11 (1980), pp. 25-37.

[11] A VIii 228.

[12] The account of collision is given on A VIii 268 (L 142), sects.20-24; the consequences are presented in a series of theorems that immediately follow (not translated in L).

[13] According to Descartes' conservation principle, the sum over all bodies of size times speed (quantity of motion) is a quantity conserved by God; see Descartes, *Principles of Philosophy*, part II, sect. 36. For a discussion, see Garber, *Descartes' Metaphysical Physics* (Chicago: University of Chicago Press, 1992), chapt. 7. It should be noted here that Descartes' principle differs from the conservation of momentum. Momentum is a vector quantity, size (mass) times *velocity*, and a change of direction entails a change in momentum, even if the speed remains the same. Not so for Descartes' quantity of motion, which remains the same even if the direction is changed. Leibniz rejects Descartes' principle of the conservation of quantity of motion, though he adheres to a principle of the conservation of momentum; see below sect. 4.3.

[14] HPN § 57; A VIii 248; cf. A VIii 249-50.

Leibniz's procedure in the HPN is very reminiscent of the creation story that Descartes told some years earlier.[15] Descartes' strategy was to derive the present state of the world from an initial creation and the laws of motion. Leibniz, too, starts at the beginning with an assumed first state, a solar and a terrestrial globe (he ignores here the other planetary bodies, large and small), which are set into motions of various sorts, resulting in these two bodies rotating each around its own axis, and revolving around each other, with light streaming from the sun to the earth.[16] Leibniz argues that the impact of the light against the surface of the earth results in the production of tiny bubbles ("bullae") of matter. This is a crucial step in the theory. For, Leibniz argues, "these...bubbles are the seeds of things,...the foundation of bodies, and the ground of all of the variety that we admire in things, and all of the impetus we find in motions."[17] The project, then, is to explain the main phenomena of the world in terms of these tiny bubbles or corpuscles. And so, for example, Leibniz discusses the Aristotelian four elements (earth, water, air and fire), showing how each can be generated from his theory (HPN sects. 13-4), gravity (HPN sects. 15f), color, sound, and heat (HPN sects. 30f), the magnet (HPN sects. 33bis f), chemical reactions (HPN sects. 37f), density and rarity (HPN sect. 56), among many other things.

Using this hypothesis that the bodies of every-day experience are made up of tiny parts, corpuscles, Leibniz is able to convince himself that he can explain why it is that larger bodies will actually resist new motion in collision more than smaller bodies will. (The account is rather complex, but I would be happy to talk about it after the lecture.) And so he wrote in the HPN:

> But by means of the wonderful handiwork of the creator, or through his gift, necessary for life, on our hypothesis all sensible bodies are elastic, due to the circulation of the ether, and therefore all sensible bodies reflect or refract....Everything is discontinuous, from which it follows that other things equal, the greater mass accomplishes more; everything is elastic, that is, when compressed, and left to itself, it soon restores itself to its prior state on account of the circulating ether.[18]

And so, the laws bodies appear to obey in our world are are the result of abstract and geometrical laws, very different from what we experience in day-to-day life, operating in a complex world that God created for his ends. Leibniz was later to see the deep problems with this account, but in 1670 and 1671, the young Leibniz was very pleased with his first serious excursion into physics.

I don't want to trace Leibniz's thought on the physical world through the rest of the 1670s; though there is change and variation, Leibniz's conception of the physical

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[15] Descartes' creation story can be found in chapt. 7 of *Le monde*, and in his *Principles*, part III, sect. 46. These two accounts differ somewhat; the initial state of the world in *Le monde* is a complete chaos, while in the *Principles*, Descartes imagines God to have created particles of approximately equal size. In the opening of part V of the *Discourse on the Method*, Descartes outlines the whole program of deriving the present state of the world from creation; see AT VI 42ff.

[16] HPN sects. 1-10; A VIii 223-6.

[17] HPN sect. 12; A VIii 226.

[18] HPN sect. 22; A VIii 229, 230.

world, as expressed in his physical and metaphysical writings of the period, remain quite stable for the next few years.

I have presented Leibniz's early period much as he himself presents it in the letter to Remond, as a more or less orthodox mechanical philosopher in the broad school of Thomas Hobbes. This oversimplifies this period of Leibniz's thought in this earlier period. Let me stop, though, and add a couple of complications to the mix, the real division of matter to infinity and the place of mind in this world.

While the TMA deals with motion more than it does with matter, some of what it says is certainly relevant to what Leibniz thought about matter at that moment. This is the way he begins the "fundamenta praedemonstrabilia," the postulates, as it were, of his system:

> (1) There are actually parts in the continuum …
> (2) and they are actually infinite …
> (3) There is no minimum in space or in body, that is, that whose magnitude or part is nothing….

Now, this infinity of parts into which bodies are divided are not non-extended mathematical points. While unextended points have a role in Leibniz's thought, they are not separate, independent beings, but the boundaries of extended magnitudes. Bodies are made up of are what might be called *physical* points, to distinguish them from the mathematical variety. The distinction between physical and mathematical points is made in a letter to the Duke Johann Friedrich from 21 May 1671, almost contemporary to the TMA. (Johann Friedrich will later be his first employer in Hannover; the young Leibniz wrote him starting in the early 1670s with enthusiastic reports of his wonderful intellectual discoveries in all domains. You can read them as kinds of job or fellowship applications. Leibniz was a very ambitious young man, not at all lacking in self-confidence.) There he is talking about what he calls a "kernel of substance" in which the soul inheres at the moment of death. He writes:

> … This kernal of substance, consisting in a physical point (which is the proximate instrument and as it were the vehicle of the soul, which is located in a mathematical point) endures forever. [Leibniz to Johann Friedrich, 21 May 1671 (A2.1.109)]

This bears on his theory of mind at that moment, in accordance with which minds are located in mathematical points. But my interest for the moment is in the distinction he makes between the mathematical point in which mind is located (presumably without extension) and the physical point of substance (body) in which the mind is placed. In another piece dated at early 1676, Leibniz imagines space packed with an infinity of spheres of increasingly smaller dimensions, filling all space without overlapping in such a way that in any finite space, one can find spheres smaller still. [A6.3.524-5; Arthur 61] In this way the continuum is divisible to infinity while, at the same time, every part of it is a finite body.

Another feature that makes the very young Leibniz's early mechanical philosophy interesting and idiosyncratic is the place that mind occupies in Leibniz's thought in the period. Earlier in this lecture I mentioned the adherence to mechanism in some of Leibniz's early theological writings, the "Confession of Nature against Atheism." In an early fragment on transubstantiation almost exactly contemporaneous with this text he

expresses a view that bodies only constitute substances when taken together with concurrent minds, either the finite human mind or the mind of God. This is grounded in kind of Aristotelian view, that a substance requires a principle of activity to be a genuine substance.

But minds enter into the natural philosophical works from the early and mid-1670s as well. In a letter Leibniz wrote in May 1671, the same year as he sent his applications for admission to the Royal Society and the Académie des Sciences, he wrote the following to Duke Johann Friedrich:

> Indeed the doctrine of the point and angle, instant and conatus … will be, for me, the key to explaining the nature of thought. For I shall demonstrate that mind consists in a point, that thought is conatus or a smallest motion, and that there can be several conatuses in the same [mind] at the same time, though not with motion. [Leibniz to Johann Friedrich, 21 May 1671 (A 2.1.113)]

This is very interesting. Like Hobbes before him, thought is identified with motion, in this case conatus, "a smallest motion." Furthermore, mind is located in a point, a mathematical point rather than a physical point, as the last quotation suggests. This suggests that to the Hobbesian world of bodies in motion, really divided into an infinity of *physical* points, Leibniz wants to add minds, different from bodies, located at *mathematical* points.

The waters are muddied a bit by one way that Leibniz sometimes characterizes this position. In the TMA and related writings, the young Leibniz characterizes bodies as what he calls "momentary minds":

> (17) No conatus lasts beyond a moment without motion except in minds. For what in a moment is conatus, in time is the motion of a body …. For every body is a momentary mind, that is, a mind lacking recollection, since it does not retain its own conatus and the other contrary one together for longer than a moment. For two things are necessary for sensing pleasure or pain—action and reaction, opposition and the harmony—and there is no sensation without them. Hence body lacks memory; it lacks the perception of its own actions and passions; it lacks thought. [*Theoria motus abstracti* A6.2.266 (L 141)]

Now, it is quite tempting to read Leibniz here as subscribing to a position like this. Bodies are actually divided into tiny parts, (physical?) points, which are their ultimate constituents. These points are of two sorts. Some of them are genuine minds, those where contrary conatus are retained; others are just momentary minds, those where the contrary conatus are resolved into motions after an instant. But even so, one is tempted to read Leibniz as holding that all the world is mind. We seem to have something strikingly like the later monadology. And it seems to be there as early as 1671!

I once thought this too. But this is, in a way, reading Leibniz's later position back into his very early years. (Remember, Leibniz is only 24 or 25 years old when he is writing this.) When reading these lines it is better to look backwards to where Leibniz was coming from rather than forwards, to where he is going. Here, as with other doctrines of the period, the inspiration is Hobbes. There isn't time for a full excursus into Hobbes on sensation, so I will summarize. (My account comes from *De Corpore* chapt. 25.) For Hobbes, of course, sensation is just motion or the endeavor (conatus) to motion. But Hobbes' account of sensation doesn't end there. If sensation were only motion, then wherever there was motion there would be sensation, and the world would be alive with

sentient creatures. Hobbes wants to block that conclusion. And so, for Hobbes, what differentiates motion that constitutes genuine sensation from mere motion is memory, the persistence of the motion in question, which allows us to compare present sensations with past. [DC 25.5] Motion by itself, without the structures necessary to retain motion and make comparison possible is not sensation for Hobbes. What that structure is for Hobbes is just the complex structure of the brain and the nervous system, including the heart, which once put into motion, will retain the motion (that is, sensation). Now, it is not unreasonable to see Leibniz's account of mind and body in these years as a direct extension of Hobbes' view. For Leibniz, too, thought is motion, as we have seen. And for Leibniz, in a genuine mind, with genuine thoughts, motions are retained. But structure that retains motion and thus makes genuine thought possible is not the brain or the nervous system, *but something that exists at a point, a mind*. Bodies have motion, of course: but they don't retain contrary motions. At the moment of collision the contrary conatuses are resolved into a single conatus, which is immediately realized as motion in time. In this way they lack a "memory" of the motions that have gone into their present state. At the moment of collision they may have as many contrary conatuses as there are bodies in collision; at that moment they are, in that sense *like* minds. But insofar as the multiplicity of conatuses in the single thing lasts only a moment, bodies are just *momentary* minds. Which is to say, they are not really minds at all. In this way Leibniz's account of body as momentary mind should *not* be understood as a way of bringing mentality to the world of bodies, but quite the contrary, it is a way of drawing a *real distinction* between body and mind. The elipsis in the quotation from TMA §17 above reads as follows: "This opens the door to the true distinction between body and mind, which no one has explained before." [A6.2.266 (L 141)]

This reading puts a rather different spin on Leibniz's metaphysics in 1671. There is mind, of course, and it is in body. And body is made up of a real infinity of (very small but extended?) parts. Furthermore, there is a real relation between body and mind insofar as both are understood in terms of the unifying notions of motion and conatus, its instantaneous part. But despite some rather superficial similarities, I think that the metaphysics of 1671 is quite different from that of the later monadology. On my understanding of the texts, Leibniz quite clearly sees himself as a heterodox Hobbesian, someone who shares many of Hobbes' basic commitments about body, motion and thought, but who has succeeded in introducing genuine mentality into Hobbes' materialist world.[19] (By the way, Leibniz actually wrote to Hobbes in 1670, letting the great man (then 82 years old) know of his wonderful discoveries. The letter begins: "To my great delight I recently learned … that you are still alive and in full health at so great an age. Hence I could not refrain from writing." This from an unknown kid in the wilds of Germany. There is no record of Hobbes ever replying. Indeed, it is quite possible that Henry Oldenburg, the Secretary of the Royal Society, to whom the letter was entrusted, never passed it on to Hobbes.)

I do not want to deny the importance of mentality in Leibniz's world in this early "mechanist" period. It is very obviously of great importance to him in the TMA and related writings. And it continues to be of importance to him in still other ways throughout this decade, even before, as he tells Remond in 1714, he was led back "from

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[19] Cf. Wilson 1997b

the material to the formal." But even so, I think that we should not read the later monadology back into these very early works, as some have recently done. It would take too long and take us too far afield to discuss the question in full detail. But let me just make a brief methodological remark, something that I shall repeat later on at crucial moments: while *we* may know where Leibniz was ultimately heading, at that moment Leibniz himself didn't. It is not surprising that we can find in the young Leibniz hints of where he will ultimately wind up; indeed, it would be surprising if we couldn't. They can be used retrospectively, perhaps, to illuminate the origin of views that Leibniz will later come to hold. But these hints have a significance for us that they almost certainly did *not* have for the young Leibniz at the moment when he wrote them. To pull them out, and give them special prominence because of our own perspective on Leibniz's career is fundamentally to distort those earlier writings, to see them from the point of view of where they will lead, and not from the point of view of where they derive. It is, of course, impossible completely to erase from our consciousness what we now know about where Leibniz went, and where philosophy went. But even so, that hardly justifies abandoning all attempts at reading Leibniz's earlier writings in an objective and non-teleological way. Enough of this sermonizing for the moment, though we shall return to these questions when discussing the even more freighted writings of Leibniz's middle years.

Despite the complexities of Leibniz's mechanical philosophy at this moment, I still think that it is fair to read him as a heterodox Hobbesian in this period, someone who shares Hobbes' basic conception of the physical world, but wants to add minds to it. As late as March 19, 1678, Leibniz sends Herman Conring a ringing endorsement of the mechanist program. He writes:

> I recognize nothing in the world but bodies and minds, and nothing in minds but intellect and will, nor anything in bodies insofar as they are separated from mind but magnitude, figure, situation, and changes in these, either partial or total. Everything else is merely said, not understood; it is sounds without meaning. Nor can anything in the world be understood clearly unless it is reduced to these. Suppose that some angel wishes to explain the nature of color to me distinctly. He will accomplish nothing by chattering about forms and faculties. … [U]nless physical things can be explained by mechanical laws, God cannot, even if he chooses, reveal and explain nature to us. [Leibniz to Conring, 19 March 1678; A2.1.400-1 (L 189). Cf. A6.4.1971-2]

But then, a year or so later (Autumn 1679), Leibniz announces dramatically in a letter to the Duke Johann Friedrich (by then his employer at Hannover), "…I reestablish substantial forms with demonstrative certainty [*démonstrativement*] and explain them intelligibly…" [A1.2.225; cf. A2.1.490] It is difficult to overstate how breathtakingly radical a move this is. At this moment Leibniz is proposing to turn the clock back almost a century, reintroducing into natural philosophy what Descartes and his contemporaries thought had been eliminated once and for all. This is the moment when Leibniz turns from the material to the formal, as he is later to tell Remond. Let us follow him into his new world he has just discovered.

But what exactly is this new view? How exactly did Leibniz propose to revive substantial forms? And, perhaps even more imporantly, *why* did Leibniz propose his new

metaphysics? A couple of documents give us some hints of what Leibniz had in mind here. At roughly the same time as Leibniz was writing to the Duke Johann Friedrich, perhaps as early as the summer of 1678, Leibniz had an inspiration for a new science, a vision quite different from the projects that grew out of his 1671 vision in the TMA and the HPN. In apparent haste, he scribbled out the plan for a new book, what the Akademie editors have entitled the "Conspectus libelli," "an outline of a little book." But the book doesn't look so small to me. It was to have been a book on the elements of physics, a comprehensive treatise giving his new view of the subject, from the most general parts of physics to the study of magnets, elasticity, "meteors, crystals, and other bodily configurations." The sketch ends with some paragraphs intended for the introduction to the book. Leibniz never got around to writing the book. Indeed, this is quite typical of his style of working; in his papers there are many such prefaces, outlines and sketches of books he contemplated writing, vast projects that he contemplated but never started in earnest. In the middle of the outline he sketched out the following proposed section:

> There follows now a discussion of incorporeal things. Certain things take place in body which cannot be explained from the necessity of matter alone. Such are the laws of motion, which depend upon the metaphysical principle of the equality of cause and effect. Therefore we must deal here with the soul and show that all things are animated. Without soul or form of some kind, body would have no being, because no part of it can be designated which does not in turn consist of more parts. Thus nothing could be designated in a body which could be called 'this thing,' or a unity. [A6.4.1988; L 278-9. Cf. A6.4.2009; L 289. Cf. A6.4.1398-9; Arthur 245, which may be from the same period.]

In this passage, Leibniz offers a number of reasons why he felt it necessary to reintroduce substantial forms at this point, deny the physical ontology of matter and mind and pass from mathematics to metaphysics in natural philosophy. They seem to break down into two broad classes:

(1) If bodies were purely material, they would not be genuine individuals: "nothing could be designated in a body which could be called 'this thing,' or a unity." Forms are introduced to deal with that apparently metaphysical problem.

(2) "Certain things take place in body which cannot be explained from the necessity of matter alone." Forms must be introduced into bodies in order to ground an adequate natural philosophy. (This piece of the argument fits into a larger theme in Leibniz's philosophy, the refutation of occasionalism and the claim that finite created things are genuinely active. More on this later.)

These will be the main arguments that we shall discuss in the following lecture, where I will try to trace out in more detail the arguments suggested here.

There are a few arguments that one might expect that are missing here. One argument is the famous argument Leibniz gives in § 8 of the *Discourse on Metaphysics*. (Don't worry if you don't know what I'm talking about yet; you will, probably before the end of the next lecture.) Outside of the *Monadology*, this is probably the best-known development of Leibniz's conception of substance in the English-language literature. In this famous passage, Leibniz argues from his predicate-in-notion principle, that in a true predication, the concept of the predicate is contained in the concept of the subject, to the existence of a complete individual concept for every individual substance, and from there

to a number of the central properties that he wants to attribute to individual substances, the fact that they are indivisible, indestructible by natural means, that they mirror everything in their worlds, that they don't communicate with one another, etc. This argument was given special prominence by Bertrand Russell, in his highly influenial commentary on Leibniz, a book that shaped the way Leibniz was read for much of the twentieth century. For Russell, this argument showed the true Leibniz, and showed that Leibniz's metaphysics was at root derived from basic logical principles. I don't mean to ignore this argument, but, at the same time I also don't think that it has the kind of centrality that others have given it for Leibniz's thought. It will have its place, but not at the beginning of my development of Leibniz's thought. I will later argue that it is a kind of complement to the other approaches to the notion of substance I want to consider first, a different way Leibniz introduces to argue for the necessity of activity in substance, a kind of logical alternative to the physical arguments we will discuss. I also want to argue that this argument has a relatively brief life in Leibniz's career; it is featured in the *Discourse on Metaphysics* and in some other texts of the decade, but seems to drop out before too much longer.

More importantly are some considerations for the necessity of introducing substantial forms in bodies from theological considerations. For example, in another passage form the same paeriod, a sketch of an attempt to evaluate the current state of knowledge, which was, in turn, part of the introduction to another unwritten treatise, this one on the establishment of a "Scientia generalis," [A6.4.451ff] Leibniz writes:

> Since … we must hold it to be certain that nothing can truly be demonstrated which is contrary to faith, I seem to have comprehended by a sort of divine gift the greatest need for a harmony between knowledge and faith, and, indeed, I consider this harmony not least among the most important reasons I have for writing, which seems good for helping so many distinguished people who are at risk on the borders of truth with respect to salvation. Therefore I have shown that everything happens mechanically in bodies, but the very principles of mechanical things, and of the whole of physics are not mechanical or mathematical, but metaphysical. I have shown that the nature of body is not placed in extension, but in a certain notion that is no less clear and very fruitful, that in every body there is a certain substantial form. ["Contemplatio de historia literaria statuque praesenti eruditionis"; A6.4.464]

It is not entirely clear why Leibniz thinks that a pure mechanical philosophy undermines faith, and how reintroducing substantial forms can help reconcile faith and reason. Some of this may have to do with the use of Leibniz's new (i.e. post-1679) account of body and substance in explaining the Eucharist and the doctrine of transubstantiation. Also important here is the way in which Leibniz's new doctrine of body and substance will allow him to introduce into the physical world contingent metaphysical principles, which God choses to maximize perfection, as well as allowing him to introduce final causes into the world, something that we shall see in connection with some of the physical arguments we consider later on. And there may be other kinds of theological arguments against the Cartesian conception of body as extension and for introducing substantial forms into

bodies as well.[20] Had we more time, we would certainly have to look more carefully into the theological considerations that lead Leibniz to reintroduce substantial forms. But though theological considerations are not unimportant, my argument would be that they are not what drove Leibniz away from the more purely mechanistic position of his earlier years and toward reintroducing substantial forms. Once there, he was no doubt quite happy to use the new ontology to support his theological projects. But, I would claim, as the 1714 letter to Remond and the 1679 "Conspectus libelli" suggest, it was other factors, metaphysical and physical that drove Leibniz to his position as a radical reactionary.

In the next lecture (two weeks from today) I want to explore the reasons that Leibniz gave for reviving substantial forms, what they are supposed to do for him. Through that we will come better to understand the conception of substance and body that Leibniz comes to adopt in his middle years.

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[20] A6.4.1402 (Arthur 245): "The overall cause of souls and the purpose of things is the greatest glory of God…."; A6.4.1460 (Arthur 261): Insofar as God relates the universe to some particular body … there results from this the substantial form or soul of this body…."