

L. Euler, *A solution to the problem of whether or not the faculty of thought can be attributed to matter, based on principles of mechanics* (1746)

Translated by J. McAlhany

Whether or not the ability to think can be attributed to matter is a difficult question, and these days especially the subject of much discussion. There are some who have declared that the faculty of thought is utterly incompatible with the nature of matter, such that not even God in his omnipotence could bring thinking matter into existence. To conceive of matter endowed with the ability to think is, in their judgment, as equally absurd as to imagine a squared circle or a log made of iron. However, others are of a different understanding, and do not believe there is enough of a difference between the faculty of thought and properties of bodies to exclude completely the former from the latter. It is entirely possible, they claim, for God to impart the faculty of thought to matter, and they attempt to support their argument primarily from the fact that we do not recognize or understand the essence of matter and all of its properties sufficiently enough to deny to matter the faculty of thought. They do not think the situation comparable to a squared circle or an iron log, but rather analogous to the example of a golden sphere: just as a sphere can be made of gold as well as not be made of gold, in the same way one can conceive of matter as thinking as well as not thinking.

First of all, I note that two paths lie open towards a resolution of this controversy. One requires a complete and full understanding of all the properties and attributes that could possibly occur in matter. For if we possessed a full understanding of all the properties and states of matter, the faculty of thought would either be included among these or not. In the former case, it would be proven that matter can think, but in the latter, there would no longer be any doubt that thought is certainly not a property of matter. However, there can be no hope of ever solving the problem in this way. For even if some philosopher should reach the point where he could enumerate in full everything that could be effected through matter, he would nonetheless never be able to convince the mass of scholars of this fact. As a result, the solution to this problem would forever be left only with sharper intellects, and the majority of people would receive no benefit from it.

To proceed to the second way, then, it must first of all be admitted that our understanding of matter and bodies is still quite incomplete, and we possess knowledge of only a few of their properties and attributes. Our inquiry must therefore be restricted to a careful consideration and examination of known properties, in order to see whether or not the faculty of thought can coexist with them. For if upon examination this faculty is found to be diametrically opposed to one or more of the known properties of bodies, so that it cannot exist together with them without contradiction, then we will have to admit that the faculty of thought cannot be attributed or imparted to matter, even by God. Therefore, if it can be demonstrated that extension and thought stand in contradiction, and thus the two cannot exist in the same being at the same time, then it would be proven that whatever has extension is thereby incapable of possessing thought. The opinion of those who contend that matter can be imbued with the faculty of thought would then be refuted beyond any doubt. But if it becomes evident there is no such contradiction between the properties of matter and the faculty of thought, it would not then be possible to deny the combination of this faculty with body, but one could at least still claim that such a combination is possible. For if we do not know all the attributes of bodies, the faculty of thought could still stand in contradiction to some other property as yet unknown. Clearly, it is much more difficult to answer the proposed question in the affirmative than in the negative. For if the affirmative is consistent with the truth, and the faculty of thought can in fact be imparted to matter, we would never be able to know this truth for certain, unless it were possible for us to investigate every characteristic of body without exception and to determine what does and does not belong together with them. But if the negative response to the question at hand holds true, and the faculty of thought is contrary to one or more properties of matter, then the discovery of a single property that excludes thought would be enough to know this for certain. Since, therefore, what thinks in us is called the soul (*anima*), we can now affirm with certainty that no one ever will prove that the soul is material, even if perhaps it really is. But if the claim that the soul is devoid of matter is in fact true, then we would rightly expect proof of this.

Since this is how the matter stands, it only remains for us to consider carefully the properties of bodies that we do know, in order to investigate whether the faculty of thought can be reconciled with them or is instead opposed to them. The first property that comes to mind is extension; all philosophers recognize it as a property of body, and Cartesians consider it to be the essence of bodies. No one will ever believe that what does not have extension can be included in the category of bodies. I do not consider here whether or not extension and thought can exist in the same entity, because this inquiry properly belongs to metaphysical speculation and, in fact, the illustrious Prof. Knutzen of Königsberg¹ has already discussed this problem rather thoroughly. He demonstrated that extension and thought are mutually opposed, and thus these two qualities are no more able to exist in the same entity as circularity and a square. And though his proof is irrefutable, I nonetheless have strong doubts it will satisfy those who are not accustomed to metaphysical meditations.

Another property of matter is impenetrability, which is so characteristic of bodies that many philosophers have not hesitated to make it, together with extension, the essence of body. Indeed, no thing that has extension but lacks impenetrability can be considered a body. Since it allows all bodies freedom of movement, it cannot be perceived by the senses, nor is it in any way inconsistent with the idea of space devoid of all matter. However, no one, as far as I know, has demonstrated whether or not impenetrability excludes the ability to think. Nor does it seem possible to undertake this inquiry without an extremely deep understanding of metaphysics.

I move now to the third property of all matter, as widely acknowledged as the two already mentioned, and which seems much more closely connected to the innermost nature of bodies. I understand that the force of inertia was discovered first by Kepler, but then explained by Newton, who derived from it the principles of all mechanics. Since reason as well as experience teaches us that every body at rest must remain constantly at rest unless set in motion from an external source, it is necessary that the reason for this constancy be contained in every body. In the same way, we know that every body, once it has been set in motion, will maintain this

movement such that it will continue constantly in a straight line at a constant speed unless disrupted by external impediments. In each case we recognize a force of conservation of state, by which all bodies are capable of continuing in their same state, either of rest or of uniformly straight motion. This is called the force of inertia. The idea of body by necessity includes the force of inertia, and thus something that has extension but lacks inertia cannot be considered a body. All philosophers now agree to this, such that no further doubt can remain. Moreover, this is confirmed and proven as a principle for mechanics, where all laws of motion are derived from this one source, and it provides the cause for all the changes that occur in the world. Nor is this property of bodies called into question by those who attach other forces to bodies, such the motive force (*vis motrix*), the living force (*vis viva*), and the active force (*vis activa*); the Wolfian² school of thought is especially occupied in explaining these. The forces of attraction, now defended by most English philosophers, do not exclude of the force of inertia. Therefore, those who think it possible for matter to be imbued with the faculty of thought do not as a rule deny the force of inertia.

In order to explain much more clearly the inherent nature of this property of bodies, which has acquired the name of inertia, it will be useful to consider two examples: first, where no obstacle impedes a body, and second, where there is an external impediment that prevents the body from continuing in its original state. In the first case, the effect of the force of inertia is evident in the perpetual conservation of the same state; for if the body is at rest, it will continue to remain at rest because of the force of inertia; but if it receives motion from anywhere, by the same force of inertia it will maintain that same motion constantly in a straight line. But in the second case, where an obstacle obstructs the body, one can see much more clearly the effect which explains why the term “force” is properly given to this property. Since the force of conservation of state is attributed to matter, it is necessary that this same force resist every change and try to remove obstacles that impede the conservation of its state. Thus if a body in motion strikes a body at rest, since the body at rest strives to remain at rest, it will try to repel the motion of the other. Likewise, when the body in motion, because of its own force of inertia, tries to continue its own motion, it will try to disrupt the state of rest of the other. Since

both bodies are impenetrable, it is impossible for each body to remain in its state, and thus it is necessary that a change occur in both: the body which had previously been at rest is put into motion, while the motion of the other body is altered. The disruptions observed in the collision of bodies have their origin in this source. Since, then, in a world full of bodies no body can continue in its motion, even for the slightest interval of time, without striking other bodies, it is clear that in all bodies changes must occur constantly, and the cause of these changes is to be sought in the force that preserves every body in its own state.

Now that these three properties of bodies have been set forth, even though they seem to provide a complete account of the nature of bodies such that no other could property exist in them, let us grant that beyond these three properties there may be many other, or rather innumerable properties with which bodies may be endowed and which are entirely unknown to us. If this be granted, even though we are not able to determine what these properties are, we can nevertheless affirm with absolute certainty that these properties do not oppose each other or the other three properties in such a way that some cancel out others. And so, since each body has extension, it is utterly impossible each body at the same time not have extension, from which one may conclude with certainty that among those innumerable properties of bodies unknown to us there is not one that excludes extension. In the same way, none of these properties can be contrary to impenetrability. And since all bodies enjoy the force of conservation of state, no property that is opposed to this force can belong to bodies. Therefore, since a force of continual change of state is diametrically opposed to the force of constant conservation of state, a force of this kind cannot be attributed to body any more than can an absence of extension or impenetrability. On this basis, the force of attraction—with which bodies are endowed, in the opinion of English philosophers—can easily be disproven. Since forces are constituted in nearly the same manner as colors, just as any body tinted with a certain color cannot at the same time possess other colors, so a body that now has one specific force is not able at the same time to take on others. Since all bodies are necessarily endowed with

the force of inertia, no other force can coincide with it, except one already included in the force of inertia, and thus it is perfectly clear that the force of attraction, by which bodies at a distance are believed to attract one another, is completely different from the force of inertia and cannot have its origin in it.

However, even though the force of inertia completely excludes all other forces, for the matter at hand I will not assume anything except that two forces diametrically opposed to each other are not able to exist in the same entity. Therefore, since each body is endowed with the force of conservation of state, a contrary force—namely, the force of continual change of state—, cannot be admitted to exist in any body.

Yet if we consider with even a moment's notice the faculty of thought, we will at once realize that in no way could it exist without the force of change of state. Although this can be proven beyond any shadow of a doubt, it would be pointless to spend any further time on this matter, as it has been convincingly demonstrated by others, and in general not even those who think it possible for the faculty of thought to be imparted to matter call this into question. Since the faculty of thought is intimately connected with the force of changing state, and a force of this sort cannot be conceived to exist in any body without contradiction, it evidently follows that no body can be endowed with the faculty of thought. From which there is a further conclusion: since the thing in us that we perceive does the thinking is called the soul (*anima*), the soul is not only not material, but is in fact a substance completely different from body, because it is endowed with a force directly opposed to those forces which can exist in a body.

To condense the entire argument that denies the faculty of thought to bodies and proves the immateriality of the soul, I summarize it in the following syllogism:

No body can have a force contrary to inertia.

The faculty of thought is a force contrary to inertia.

Therefore, no body can possess the faculty of thought.

The major premise of this syllogism is abundantly clear, for it is based on the principle of contradiction, which denies that the same quality can both exist and not exist in the same subject at the same time. Anyone who should wish to refute this premise ought to establish that the force of inertia can at the same time both exist and not exist in bodies, which no one but a madman would dare to assert.

Moreover, the minor premise is equally certain, and could be corroborated with the firmest of arguments, if everyone did not already willingly agree to it. Therefore, I can in no way see how this conclusion could be called into doubt; rather, the truth of it seems as rigorously proven as the truth of any proposition of pure geometry.

¹ Martin Knutzen (1713-1715)

² Christian Wolff (1659-1754)