

Magnetism

Post by "Cassius" of October 15, 2025 at 10:31 AM

I was looking for a place to post the article referenced below, and then I realized that we do not have a subforum devoted to magnetism. We know more about Epicurean theory of magnetism than we do about Epicurean theory on a lot of other issues, given the treatment that we have in Lucretius. Did you realize that we have over a THOUSAND lines explaining magnetism?

So this thread will serve as a starting point for future discussion. I see that we also dealt with this in episodes [Ninety](#) and [Ninety-one](#) of Lucretius Today.

This was obviously a topic Lucretius considered to be important. Why? Possibly because it is a dramatic, immediate, and visible challenge to what we ordinarily see so as to make some wonder if it is not supernatural? That probably makes it a useful tool for discussion. For many years I have had a wooden version of [this](#). (Perhaps we need another thread for "science toys that illustrate unseen forces".)

Quote

[6:906] For what follows, I will essay to tell by what law of nature it comes to pass that iron can be attracted by the stone which the Greeks call the magnet, from the name of its native place, because it has its origin within the boundaries of its native country, the land of the Magnetes. At this stone men marvel; indeed, it often makes a chain of rings all hanging to itself. For sometimes you may see five or more in a hanging chain, and swaying in the light breezes, when one hangs on to the other, clinging to it beneath, and each from the next comes to feel the binding force of the stone: in such penetrating fashion does its force prevail.

[6:917] In things of this kind much must be made certain before you can give account of the thing itself, and you must approach by a circuit exceeding long: therefore all the more I ask for attentive ears and mind.

[6:921] First of all from all things, whatsoever we can see, it must needs be that there stream off, shot out and scattered abroad, bodies such as to strike the eyes and awake our vision. And from certain things scents stream off unceasingly; even as cold streams from rivers, heat from the sun, spray from the waves of the sea, which gnaws away the walls by the seashore. Nor do diverse sounds cease to ooze through the air. Again, moisture of a salt savour often comes into our mouth, when we walk by the sea, and on the other hand, when we behold wormwood being diluted and mixed, a bitter taste touches it. So surely from all things each several thing is carried off in a stream, and is sent abroad to every quarter on all sides, nor is any delay or respite granted in this

flux, since we perceive unceasingly, and we are suffered always to descry and smell all things, and to hear them sound.

[6:936] Now I will tell over again of how rarefied a body all things are; which is clearly shown in the beginning of my poem too. For verily, although it is of great matter to learn this for many things, it is above all necessary for this very thing, about which I am essaying to discourse, to make it sure that there is nothing perceptible except body mingled with void. First of all it comes to pass that in caves the upper rooks sweat with moisture and drip with trickling drops. Likewise sweat oozes out from all our body, the beard grows and hairs over all our limbs and members, food is spread abroad into all the veins, yea, it increases and nourishes even the extreme parts of the body, and the tiny nails. We feel cold likewise pass through bronze and warm heat, we feel it likewise pass through gold and through silver, when we hold full cups in our hands. Again voices fly through stone partitions in houses, smell penetrates and cold and the heat of fire, which is wont to pierce too through the strength of iron. Again, where the breastplate of the sky closes in the world all around \[B-6:the bodies of clouds and the seeds of storms enter in\], and with them the force of disease, when it finds its way in from without; and tempests, gathering from earth and heaven, hasten naturally to remote parts of heaven and earth; since there is nothing but has a rare texture of body.

[6:959] There is this besides, that not all bodies, which are thrown off severally from things, are endowed with the same effect of sense, nor suited in the same way to all things. First of all the sun bakes the ground and parches it, but ice it thaws and causes the snows piled high on the high mountains to melt beneath its rays. Again, wax becomes liquid when placed in the sun's heat. Fire likewise makes bronze liquid and fuses gold, but skins and flesh it shrivels and draws all together. Moreover, the moisture of water hardens iron fresh from the fire, but skins and flesh it softens, when hardened in the heat. The wild olive as much delights the bearded she-goats, as though it breathed out a flavour steeped in ambrosia and real nectar; and yet for a man there is no leafy plant more bitter than this for food. Again, the pig shuns marjoram, and fears every kind of ointment; for to bristling pigs it is deadly poison, though to us it sometimes seems almost to give new life. But on the other hand, though to us mud is the foulest filth, this very thing is seen to be pleasant to pigs, so that they wallow all over in it and never have enough.

[6:979] This too remains, which it is clear should be said, before I start to speak of the thing itself. Since many pores are assigned to diverse things, they must needs be endowed with a nature differing from one another, and have each their own nature and passages. For verily there are diverse senses in living creatures, each of which in its own way takes in its own object within itself. For we see that sounds pass into one place and the taste from savours into another, and to another the scent of smells. Moreover, one thing is seen to pierce through rocks, another through wood, and another to pass through gold, and yet another to make its way out from silver and

glass. For through the one vision is seen to stream, though the other heat to travel, and one thing is seen to force its way along the same path quicker than others. We may know that the nature of the passages causes this to come to pass, since it varies in many ways, as we have shown a little before on account of the unlike nature and texture of things.

[6:998] Wherefore, when all these things have been surely established and settled for us, laid down in advance and ready for use, for what remains, from them we shall easily give account, and the whole cause will be laid bare, which attracts the force of iron.

[6:1002] First of all it must needs be that there stream off this stone very many seeds or an effluence, which, with its blows, parts asunder all the air which has its place between the stone and the iron. When this space is emptied and much room in the middle becomes void, straightway first-beginnings of the iron start forward and fall into the void, all joined together; it comes to pass that the ring itself follows and advances in this way, with its whole body. Nor is anything so closely interlaced in its first particles, all clinging linked together, as the nature of strong iron and its cold roughness. Therefore it is the less strange, since it is led on by its particles, that it is impossible for many bodies, springing together from the iron, to pass into the void, but that the ring itself follows; and this it does, and follows on, until it has now reached the very stone and clung to it with hidden fastenings. This same thing takes place in every direction; on whichever side room becomes void, whether athwart or above, the neighbouring bodies are carried at once into the void. For indeed they are set in motion by blows from the other side, nor can they themselves of their own accord rise upwards into the air.

[6:1022] To this there is added, that it may the more be able to come to pass, this further thing as an aid, yea, the motion is helped, because, as soon as the air in front of the ring is made rarer, and the place becomes more empty and void, it straightway comes to pass that all the air which has its place behind, drives, as it were, and pushes the ring forward. For the air which is set all around is for ever buffeting things; but it comes to pass that at times like this it pushes the iron forward, because on one side there is empty space, which receives the ring into itself. This air, of which I am telling you, finds its way in subtly through the countless pores of the iron right to its tiny parts, and thrusts and drives it on, as wind drives ship and sails. Again, all things must have air in their body seeing that they are of rare body, and the air is placed round and set close against all things. This air then, which is hidden away deep within the iron, is ever tossed about with restless motion, and therefore without doubt it buffets the ring and stirs it within; the ring, we may be sure, is carried towards the same side to which it has once moved headlong, struggling hard towards the empty spot.

[6:1042] It comes to pass, too, that the nature of iron retreats from this stone at times, and is wont to flee and follow turn by turn. Further, I have seen Samothracian

iron rings even leap up, and at the same time iron filings move in a frenzy inside brass bowls, when this Magnesian stone was placed beneath: so eagerly is the iron seen to desire to flee from the stone. When the brass is placed between, so great a disturbance is brought about because, we may be sure, when the effluence of the brass has seized beforehand and occupied the open passages in the iron, afterwards comes the effluence of the stone, and finds all full in the iron, nor has it a path by which it may stream through as before. And so it is constrained to dash against it and beat with its wave upon the iron texture; and in this way it repels it from itself, and through the brass drives away that which without it it often sucks in.

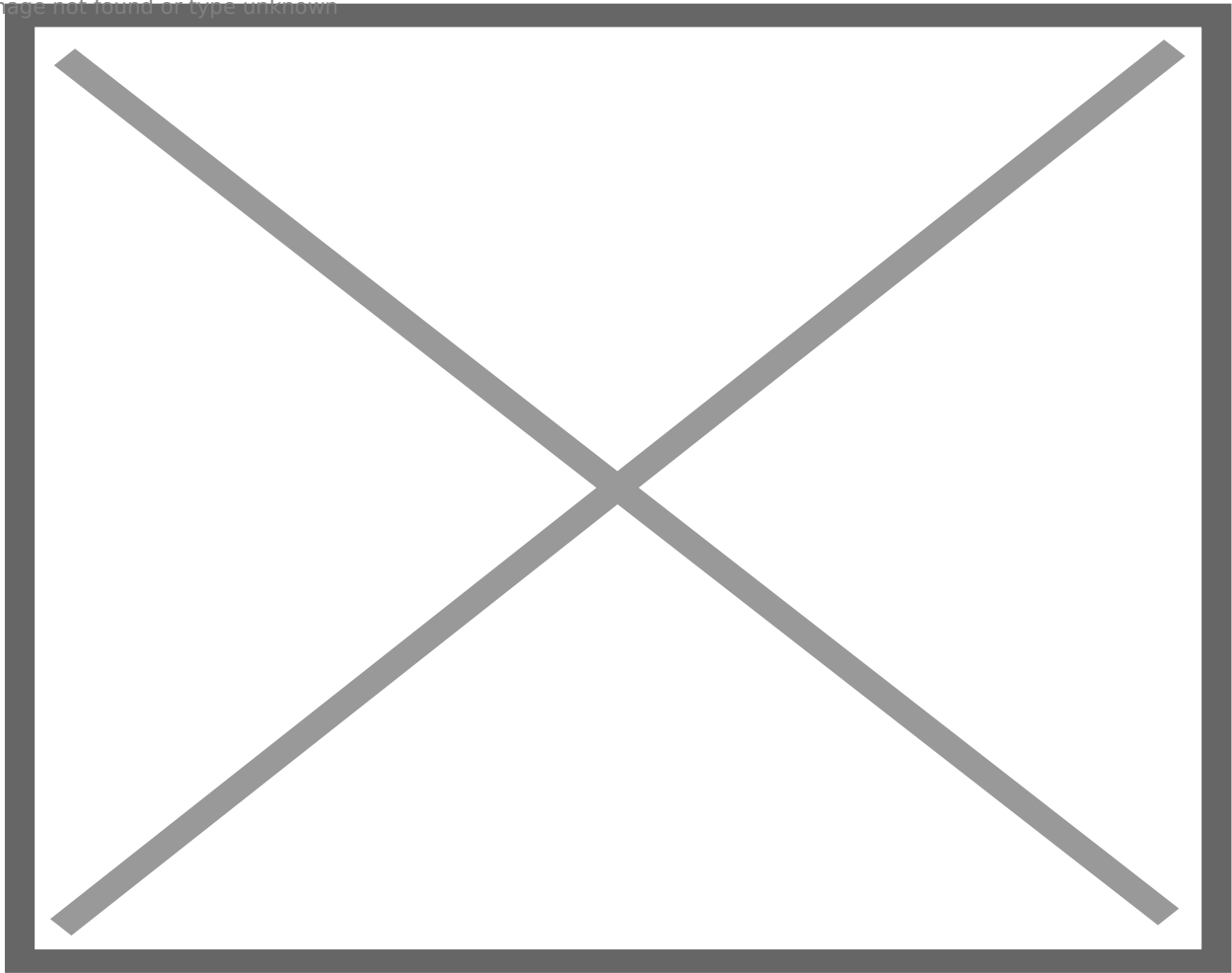
[6:1056] Herein refrain from wondering that the effluence from this stone has not the power to drive other things in the same way. For in part they stand still by the force of their own weight, as for instance, gold; and partly, because they are of such rare body, that the effluence flies through untouched, they cannot be driven anywhere; among this kind is seen to be the substance of wood. The nature of iron then has its place between the two, and when it has taken in certain tiny bodies of brass, then it comes to pass that the Magnesian stones drive it on with their stream.

[6:1065] And yet these powers are not so alien to other things that I have only a scanty store of things of this kind, of which I can tell—things fitted just for each other and for naught besides. First you see that stones are stuck together only by mortar. Wood is united only by bulls' glue, so that the veins of boards more often gape than the bindings of the glue will loosen their hold. The juice born of the grape is willing to mingle with streams of water, though heavy pitch and light olive-oil refuse. And the purple tint of the shellfish is united only with the body of wool, yet so that it cannot be separated at all, no, not if you were to be at pains to restore it with Neptune's wave, no, nor if the whole sea should strive to wash it out with all its waves. Again, is not there one thing only that binds gold to gold? is it not true that brass is joined to brass only by white lead? How many other cases might we find! What then? You have no need at all of long rambling roads, nor is it fitting that I should spend so much pains on this, but 'tis best shortly in a few words to include many cases. Those things, whose textures fall so aptly one upon the other that hollows fit solids, each in the one and the other, make the best joining. Sometimes, too, they may be held linked with one another, as it were, fastened by rings and hooks; as is seen to be more the case with this stone and the iron.

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