

## A Synopsis of Natural Philosophy

### Epicurus

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*This excerpt is taken from Epicurus' Letter to Herodotus.<sup>1</sup> The English translation presented here is by Robert Drew Hicks, a work that is in the public domain. This version, edited by Spyros Tserkis, incorporates minor updates to modernize archaic language. The copyright notice below applies solely to the edited and formatted version presented here.*

In this excerpt, Epicurus gives a brief outline of his natural philosophy in the form of a letter to Herodotus. He argues for materialism, claiming that everything, including the soul, consists of atoms moving in the void and that nothing arises from non-being. Epicurus foreshadows the modern scientific perspective by explaining natural phenomena through sense experience and reason alone, without recourse to divine agency. For Epicurus, understanding nature is not merely theoretical but therapeutic, freeing the mind from fear and serving his broader ethical aim of mental tranquility.

[...]

In the first place, Herodotus, you must understand what it is that words denote, in order that by reference to this we may be in a position to test opinions, inquiries, or problems, so that our proofs may not run on untested ad infinitum, nor the terms we use be empty of meaning. [...] Next, we must by all means stick to our sensations [...] in order that we may have the means of determining that which needs confirmation and that which is obscure.

[...] To begin with, nothing comes into being out of what is non-existent. [...] Moreover, the sum total of things was always such as it is now, and such it will ever remain. For there is nothing into which it can change. For outside the sum of things there is nothing which could enter into it and bring about the change.

Further, the whole of being consists of bodies and space. For the existence of bodies is everywhere attested by sense itself, and it is upon sensation that reason must rely when it attempts to infer the unknown from the known. And if there were no space (which we call also void and place and intangible nature), bodies would have nothing in which to be and through which to move, as they are plainly seen to move. Beyond bodies

and space there is nothing which by mental apprehension or on its analogy we can conceive to exist. When we speak of bodies and space, both are regarded as wholes or separate things, not as the properties or accidents of separate things.

[...] Of bodies some are composite, others the elements of which these composite bodies are made. These elements are indivisible and unchangeable, and necessarily so, if things are not all to be destroyed and pass into non-existence, but are to be strong enough to endure when the composite bodies are broken up, because they possess a solid nature and are incapable of being anywhere or anyhow dissolved. It follows that the first beginnings must be indivisible, corporeal entities.

[...] The sum of things is infinite. For what is finite has an extremity, and the extremity of anything is discerned only by comparison with something else. [...] Moreover, the sum of things is unlimited both by reason of the multitude of the atoms and the extent of the void. For if the void were infinite and bodies finite, the bodies would not have stayed anywhere but would have been dispersed in their course through the infinite void [...]. [...] If the void were finite, the infinity of bodies would not have anywhere to be.

Furthermore, the atoms, which have no void in them—out of which composite bodies arise and into which they are dissolved—vary indefinitely in their shapes; for so many varieties of things as we see could never have arisen out of a recurrence of a definite number of the same shapes. The like atoms of each shape are absolutely infinite; but the variety of shapes, though indefinitely large, is not absolutely infinite.

The atoms are in continual motion through all eternity. Some of them rebound to a considerable

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distance from each other, while others merely oscillate in one place when they happen to have become bound or to be enclosed by a mass of other atoms shaped to bind. This is because each atom is separated from the rest by void, which is incapable of offering any resistance to the rebound; while it is the solidity of the atom which makes it rebound after a collision [...]. Of all this there is no beginning, since both atoms and void exist from everlasting.

[...]

Moreover, there is an infinite number of worlds, some like this world, others unlike it. For the atoms being infinite in number, as has just been proved, are carried ever further in their course. For the atoms out of which a world might arise, or by which a world might be formed, have not all been expended on one world or a finite number of worlds, whether like or unlike this one. Hence there will be nothing to hinder an infinity of worlds.

Again, there are outlines [...], which are of the same shape as solid bodies, but of a thinness far exceeding that of any object that we see. For it is not impossible that there should be found in the surrounding air combinations of this kind, materials adapted for [...] preserving the same relative position and motion which they had in the solid objects from which they come. To these outlines we give the name of 'images' or 'idols.' Furthermore, so long as nothing comes in the way to offer resistance, motion through the void accomplishes any imaginable distance in an inconceivably short time. For resistance encountered is the equivalent of slowness, its absence the equivalent of speed.

Not that, if we consider the time perceptible by reason alone, the moving body itself arrives at more than one place simultaneously (for this too is inconceivable), although in time perceptible to sense it does arrive simultaneously, however different the point of departure from that conceived by us. For if it changed its direction, that would be equivalent to its meeting with resistance, even if up to that point we allow nothing to impede the rate of its flight. [...] In the next place the exceeding thinness of the images is contradicted by none of the facts under our observation. Hence also their velocities are enormous, since they always find a void passage to fit them. Besides, their incessant effluence meets with no resistance, or very little, although many atoms, not to say an unlimited number, do at once encounter resistance.

Besides this, [...] the production of the images is as quick as thought. For particles are continually streaming off from the surface of bodies, though

no diminution of the bodies is observed, because other particles take their place. And those given off for a long time retain the position and arrangement which their atoms had when they formed part of the solid bodies, although occasionally they are thrown into confusion. [...]

We must also consider that it is by the entrance of something coming from external objects that we see their shapes and think of them. For external things would not stamp on us their own nature of colour and form through the medium of the air which is between them and us, or by means of rays of light or currents of any sort going from us to them, so well as by the entrance into our eyes or minds, to whichever their size is suitable, of certain images coming from the things themselves, these images or outlines being of the same colour and shape as the external things themselves. They move with rapid motion; and this again explains why they present the appearance of the single continuous object, and retain the mutual interconnexion which they had in the object, when they impinge upon the sense, such impact being due to the oscillation of the atoms in the interior of the solid object from which they come. And whatever presentation we derive by direct contact, whether it be with the mind or with the sense-organs, be it shape that is presented or other properties, this shape as presented is the shape of the solid thing, and it is due either to a close coherence of the image as a whole or to a mere remnant of its parts. Falsehood and error always depend upon the intrusion of opinion [when a fact awaits] confirmation or the absence of contradiction, which fact is afterwards frequently not confirmed [or even contradicted].

For the presentations which, e.g., are received in a picture or arise in dreams, or from any other form of apprehension by the mind or by the other criteria of truth, would never have resembled what we call the real and true things, had it not been for certain actual things of the kind with which we come in contact. Error would not have occurred, if we had not experienced some other movement in ourselves, conjoined with, but distinct from, the perception of what is presented. And from this movement, if it be not confirmed or be contradicted, falsehood results; while, if it be confirmed or not contradicted, truth results. And to this view we must closely adhere, if we are not to repudiate the criteria founded on the clear evidence of sense, nor again to throw all these things into confusion by maintaining falsehood as if it were truth.

[...] Hearing takes place when a current passes from the object, whether person or thing, which emits voice or sound or noise, or produces the

sensation of hearing in any way whatever. This current is broken up into homogeneous particles, which at the same time preserve a certain mutual connexion and a distinctive unity extending to the object which emitted them, and thus, for the most part, cause the perception in that case or, if not, merely indicate the presence of the external object. For without the transmission from the object of a certain interconnexion of the parts no such sensation could arise. Therefore we must not suppose that the air itself is moulded into shape by the voice emitted or something similar; for it is very far from being the case that the air is acted upon by it in this way. The blow which is struck in us when we utter a sound causes such a displacement of the particles as serves to produce a current resembling breath, and this displacement gives rise to the sensation of hearing.

Again, we must believe that smelling, like hearing, would produce no sensation, were there not particles conveyed from the object which are of the proper sort for exciting the organ of smelling, some of one sort, some of another, some exciting it confusedly and strangely, others quietly and agreeably.

Moreover, we must hold that the atoms in fact possess none of the qualities belonging to things which come under our observation, except shape, weight, and size, and the properties necessarily conjoined with shape. For every quality changes, but the atoms do not change, since, when the composite bodies are dissolved, there must needs be a permanent something, solid and indissoluble, left behind, which makes change possible: not changes into or from the non-existent, but often through differences of arrangement, and sometimes through additions and subtractions of the atoms. Hence these somethings capable of being diversely arranged must be indestructible, exempt from change, but possessed each of its own distinctive mass and configuration. This must remain.

For in the case of changes of configuration within our experience the figure is supposed to be inherent when other qualities are stripped off, but the qualities are not supposed, like the shape which is left behind, to inhere in the subject of change, but to vanish altogether from the body. Thus, then, what is left behind is sufficient to account for the differences in composite bodies, since something at least must necessarily be left remaining and be immune from annihilation.

[...] You should not suppose that the atoms have any and every size, [...] but differences of size must be admitted; for this addition renders the facts of feeling and sensation easier of explanation. But to attribute any and every magnitude to

the atoms does not help to explain the differences of quality in things; moreover, in that case atoms large enough to be seen ought to have reached us, which is never observed to occur; nor can we conceive how its occurrence should be possible, i.e. that an atom should become visible.

Besides, you must not suppose that there are parts unlimited in number, be they ever so small, in any finite body. Hence not only must we reject as impossible subdivision ad infinitum into smaller and smaller parts, [...] but in dealing with finite things we must also reject as impossible the progression ad infinitum by less and less increments.

For when once we have said that an infinite number of particles, however small, are contained in anything, it is not possible to conceive how it could any longer be limited or finite in size. For clearly our infinite number of particles must have some size; and then, of whatever size they were, the aggregate they made would be infinite. And, in the next place, since what is finite has an extremity which is distinguishable, even if it is not by itself observable, it is not possible to avoid thinking of another such extremity next to this. Nor can we help thinking that in this way, by proceeding forward from one to the next in order, it is possible by such a progression to arrive in thought at infinity.

We must consider the minimum perceptible by sense as not corresponding to that which is capable of being traversed, i.e. is extended, nor again as utterly unlike it, but as having something in common with the things capable of being traversed, though it is without distinction of parts. But when from the illusion created by this common property we think we shall distinguish something in the minimum, one part on one side and another part on the other side, it must be another minimum equal to the first which catches our eye. In fact, we see these minima one after another, beginning with the first, and not as occupying the same space; nor do we see them touch one another's parts with their parts, but we see that by virtue of their own peculiar character (i.e. as being unit indivisibles) they afford a means of measuring magnitudes: there are more of them, if the magnitude measured is greater; fewer of them, if the magnitude measured is less.

We must recognize that this analogy also holds of the minimum in the atom; it is only in smallness that it differs from that which is observed by sense, but it follows the same analogy. On the analogy of things within our experience we have declared that the atom has magnitude; and this, small as it is, we have merely reproduced on a larger scale. And further, the least and simplest

things must be regarded as extremities of lengths, furnishing from themselves as units the means of measuring lengths, whether greater or less, the mental vision being employed, since direct observation is impossible. For the community which exists between them and the unchangeable parts (i.e. the minimal parts of area or surface) is sufficient to justify the conclusion so far as this goes. But it is not possible that these minima of the atom should group themselves together through the possession of motion.

Further, we must not assert 'up' or 'down' of that which is unlimited [...]. As to the space overhead, however, if it be possible to draw a line to infinity from the point where we stand, we know that never will this space—or, for that matter, the space below the supposed standpoint if produced to infinity—appear to us to be at the same time 'up' and 'down' with reference to the same point; for this is inconceivable. Hence it is possible to assume one direction of motion, which we conceive as extending upwards ad infinitum, and another downwards, even if it should happen ten thousand times that what moves from us to the spaces above our heads reaches the feet of those above us, or that which moves downwards from us the heads of those below us. None the less is it true that the whole of the motion in the respective cases is conceived as extending in opposite directions ad infinitum.

When they are traveling through the void and meet with no resistance, the atoms must move with equal speed. Neither will heavy atoms travel more quickly than small and light ones, so long as nothing meets them, nor will small atoms travel more quickly than large ones, provided they always find a passage suitable to their size, and provided also that they meet with no obstruction. Nor will their upward or their lateral motion, which is due to collisions, nor again their downward motion, due to weight, affect their velocity. As long as either motion obtains, it must continue, quick as the speed of thought, provided there is no obstruction, whether due to external collision or to the atoms' own weight counteracting the force of the blow.

Moreover, when we come to deal with composite bodies, one of them will travel faster than another, although their atoms have equal speed. This is because the atoms in the aggregates are traveling in one direction during the shortest continuous time, albeit they move in different directions in times so short as to be appreciable only by the reason, but frequently collide until the continuity of their motion is appreciated by sense. [...] Our principle is that direct observation by sense and direct apprehension by the mind are alone in-

variably true.

Next, keeping in view our perceptions and feelings [...], we must recognize generally that the soul is a corporeal thing, composed of fine particles, dispersed all over the frame, most nearly resembling wind with an admixture of heat, in some respects like wind, in others like heat. But, again, there is the third part which exceeds the other two in the fineness of its particles and thereby keeps in closer touch with the rest of the frame. And this is shown by the mental faculties and feelings, by the ease with which the mind moves, and by thoughts, and by all those things the loss of which causes death. Further, we must keep in mind that soul has the greatest share in causing sensation. Still, it would not have had sensation, had it not been somehow confined within the rest of the frame. But the rest of the frame, though it provides this indispensable condition for the soul, itself also has a share, derived from the soul, of the said quality; and yet does not possess all the qualities of soul. Hence on the departure of the soul it loses sentience. [...]

Hence, so long as the soul is in the body, it never loses sentience through the removal of some other part. The containing frame may be dislocated in whole or in part, and portions of the soul may thereby be lost; yet in spite of this the soul, if it manage to survive, will have sentience. But the rest of the frame, whether the whole of it survives or only a part, no longer has sensation, when once those atoms have departed, which, however few in number, are required to constitute the nature of soul. Moreover, when the whole frame is broken up, the soul is scattered and has no longer the same powers as before, nor the same motions; hence it does not possess sentience either.

For we cannot think of it as sentient, except it be in this composite whole and moving with these movements; nor can we so think of it when the frames which enclose and surround it are not the same as those in which the soul is now located and in which it performs these movements.

There is the further point to be considered, what the incorporeal can be, if, I mean, according to current usage the term is applied to what can be conceived as self-existent. But it is impossible to conceive anything that is incorporeal as self-existent except empty space. And empty space cannot itself either act or be acted upon, but simply allows body to move through it. Hence those who call soul incorporeal speak foolishly. For if it were so, it could neither act nor be acted upon. But, as it is, both these properties, you see, plainly belong to soul.

[...]

Moreover, shapes and colours, magnitudes and weights, and in short all those qualities which are predicated of body, in so far as they are perpetual properties either of all bodies or of visible bodies, are knowable by sensation of these very properties: these, I say, must not be supposed to exist independently by themselves (for that is inconceivable), nor yet to be non-existent, nor to be some other and incorporeal entities adhering to body, nor again to be parts of body. We must consider the whole body in a general way to derive its permanent nature from all of them, though it is not, as it were, formed by grouping them together in the same way as when from the particles themselves a larger aggregate is made up, whether these particles be primary or any magnitudes whatsoever less than the particular whole. All these qualities, I repeat, merely give the body its own permanent nature. They all have their own characteristic modes of being perceived and distinguished, but always along with the whole body in which they inhere and never in separation from it; and it is in virtue of this complete conception of the body as a whole that it is so designated.

Again, qualities often attach to bodies without being permanent attributes. They are not to be classed among invisible entities nor are they incorporeal. Hence, using the term 'states' in the commonest sense, we say plainly that 'states' have not the nature of the whole thing to which they belong, and to which, conceiving it as a whole, we give the name of body, nor that of the permanent properties without which body cannot be thought of. And in virtue of certain peculiar modes of apprehension into which the complete body always enters, each of them can be called a state. But only as often as they are seen actually to belong to it, since such states are not perpetual attributes. There is no need to banish from reality this clear evidence that the state has not the nature of that whole—by us called body—to which it belongs, nor of the permanent properties which accompany the whole. Nor, on the other hand, must we suppose the state to have independent existence [...]. [...]

There is another thing which we must consider carefully. We must not investigate time as we do the other states which we investigate in a subject, namely, by referring them to the preconceptions envisaged in our minds; but we must take into account the plain fact itself, in virtue of which we speak of time as long or short, linking to it in intimate connexion this attribute of duration. [...]. [...]

[...] We have next to consider that the worlds and every finite aggregate which bears a strong resemblance to things we commonly see have

arisen out of the infinite. For all these, whether small or great, have been separated off from special conglomerations of atoms; and all things are again dissolved, some faster, some slower, some through the action of one set of causes, others through the action of another.

And further, we must not suppose that the worlds have necessarily one and the same shape. For nobody can prove that in one sort of world there might not be contained, whereas in another sort of world there could not possibly be, the seeds out of which animals and plants arise and all the rest of the things we see.

[...]

[...] We are bound to believe that in the sky revolutions, solstices, eclipses, risings and settings, and the like, take place without the ministration or command, either now or in the future, of any being who at the same time enjoys perfect bliss along with immortality. [...] Hence, where we find phenomena invariably recurring, the invariableness of the recurrence must be ascribed to the original interception and conglomeration of atoms whereby the world was formed.

Further, we must hold that to arrive at accurate knowledge of the cause of things [...] is the business of natural science, and that happiness depends on this [...].

[...]

Hence, if we discover more than one cause that may account for solstices, settings and risings, eclipses and the like [...] we must not suppose that our treatment of these matters fails of accuracy, so far as it is needful to ensure our tranquillity and happiness. [...]

[...] The greatest anxiety of the human mind arises through the belief that the heavenly bodies are blessed and indestructible, and that at the same time they have volitions and actions and causality inconsistent with this belief; and through expecting or apprehending some everlasting evil, either because of the myths, or because we are in dread of the mere insensibility of death, as if it had to do with us; and through being reduced to this state not by conviction but by a certain irrational perversity, so that, if men do not set bounds to their terror, they endure as much or even more intense anxiety than the man whose views on these matters are quite vague. But mental tranquillity means being released from all these troubles and cherishing a continual remembrance of the highest and most important truths.

Hence we must attend to present feelings and sense perceptions, whether those of mankind in

general or those peculiar to the individual, and also attend to all the clear evidence available, as given by each of the standards of truth. For by studying them we shall rightly trace to its cause and banish the source of disturbance and dread, accounting for celestial phenomena and for all other things which from time to time befall us and cause the utmost alarm to the rest of mankind.

[...]

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## References

1. *The Fundamental Books of Epicurus: Principal Doctrines, Vatican Sayings, and Letters* (Amazon Digital Services LLC, 2021).