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S.A.M.

Galen's *On the Elements According to Hippocrates*

Book One

413-415. Since the element is the smallest part of whatever thing may possess an element, what is perceived as the smallest does not seem to be the same as what, in reality, is the smallest. For many things escape perception due to their smallness. It is quite clear that perception of these elements in the nature and reality of each thing should not be the means of judging. Indeed, if, after carefully grinding rust and cadmium and stone-silver and *misu* all commonly together, and making them powdery, you wished to rely on perception to discern them, they would all seem to you to be one single thing. And if you mixed not merely four, but many more, with each other in the same place, these all would seem to you to be one single thing, although they were not. Hippocrates, then, examining these elements of the nature of man, dismissed primary and simplest things as defined by perception, and sought, rather, the ones which were primary and simplest by nature and in reality. And indeed, the usefulness of these latter in healing is no less than the usefulness of those which are primary as defined by perception, as has been shown in other works. And even if someone concedes for these perceptible things that they seem to be elements, still he does not concede that they, in fact, are elements. For it is not the part that merely appears simplest and primary, but the one that is so by nature, which truly is an element. So, if we were to say that the part which is perceived as the smallest and primary were an element by nature, some parts would seem to be elements to eagles and to the lynx, and different parts if some other man or animal were the most sharp-sighted, and still different ones to each of us. However, this is not so; rather, we seek the elements that are primary and simplest by nature, and incapable of being divided into others, if we would wish to grasp exactly the knowledge of the nature of man or of some other existing thing.

415-417. What is the method of investigating these things? To me it seems to be none other than that method which Hippocrates introduced. For it must be investigated firstly if there is one single element with respect to form, or if there are many various and dissimilar ones; and, secondly, if there are many various and dissimilar elements, how many and what sort they are, and in what manner do they possess a commonality with each other. That the single primary element, from which our bodies and the bodies of all others are born, is not one single thing, Hippocrates demonstrates from these questions. And it seems better for me, as I explain this, to set forth this passage of his thus:

> *And I myself say, if man were one single thing, he would never suffer, for, as one single thing, there would be nothing from which he could suffer.*

In this very brief statement, along with the aptness of his explanation, he seems to me to speak most admirably concerning the fact that the element

cannot be one single thing with respect to form and quality. For it is clearly obvious that saying that the existing element is one in number is a matter of utmost absurdity and belongs to no man who pays attention to what is obvious. Someone might be able to say that all things are one single thing by form and by quality, as do those who speak of the 'atoms' according to Epicurus and Democritus. And those who postulate that elements are the smallest and undivided and without parts are of the same chorus as these. Hippocrates, making a common counter-argument against all such people, showed that the element was not one single thing with respect to form and quality, and did not even mention those who say that the existing element is one in number, since they are absolutely capricious. Thus we know, if he has concluded correctly and spoken properly against those who assert that the element is one single thing by nature, that they wish to claim that it is an atom or indivisible, or the smallest or without parts. For once we have analyzed the general commonality of all the choices, we will not omit their differences in turn hereafter.

417-420. He assumes that for all these people the primary element is without quality, and does not possess an innate whiteness or blackness or any color at all, and no sweetness or bitterness or heat or coldness, and does not possess any other quality at all. Democritus says, *"color by convention, sweet by convention, bitter by convention, in fact indivisible and empty,"* supposing that from the junction of atoms all the perceptible qualities arise as the things perceptible to us, and that nothing is by nature white or black or yellow or red or sweet or bitter. For 'by convention' means the same as 'accounted as such' and 'according to us', not 'in the very nature of things'. And moreover, he who names something by its real nature, according to reality, reveals the true thing in having creating its name. And the entire sense of his account would be this: something is thought, as far as men are concerned, to be white and black and sweet and bitter and all the others of this sort, but in fact, all things are one and nothing. For he also has said this again by naming the atoms 'one' and the emptiness 'nothing'. So all the atoms, being small bodies, are without qualities, and the emptiness is some place in which all these bodies, carried up and down through all eternity, either are entangled with each other somehow, or strike against each other and rebound and separate and again are compounded into each other in such unions, and from this he derives all the other unions and our bodies and their affections and the senses. And some people, such as the followers of Epicurus, assume that the primary bodies are invulnerable and unhurt due to their hardness; and some, such as the followers of Leucippus, assume that they are indistinguishable due to their smallness. They suppose, rather, that the primary bodies are incapable of being changed in those alterations which all educated men, based on their senses, have trusted take place, so that they say none of these bodies are heated or chilled, and in the same way are not dried or made wet, and still more are not made white or black or allowed any other quality at all in any change. Thus Hippocrates argues against them well when he says man would never suffer if his nature were one such as they described, for something which is to suffer, of course, must necessarily have two qualities: it must be capable of change and it must be sensate. For if it never allowed any change, it would completely preserve the state it possessed from the beginning, and it would not allow suffering. And if it should change – just as do rocks and pieces of wood which are heated, and then chilled, and then broken – but there were no perception inborn to it, it would have no perception of the situation around it, just as rocks do not. And, indeed, in both of these cases, the elements of these things would be unable to be changed or perceived by means of any inborn nature of the atom. Thus, if we were made of some atoms or of some such other uniform nature, we would not suffer. But we do suffer. Therefore it is clear that we do not exist formed from some simple and uniform substance. The chief point of

this argument, which is clear to all those who are practiced in logical theory, thus proves what is proposed.

420-424. Since, in addition to their lack of experience with logic, those who claim there are such elements are also fruitlessly combative and think that it is a great evil to change for the better, one must endeavor to publicly expose to them this account in a general way, step by step, in some examples. For if someone were to pierce the skin with the finest needle, the creature would certainly suffer, and the needle would touch one or two or more atoms. Assume first that it touches one. But each of the atoms are invulnerable and insensate. Thus something would not be affected by the needle, and even if it were affected, would not feel the condition of being affected. For if suffering arises from these two things: from a sensate thing being affected, and from its perceiving the condition of being affected, and if neither of these two things are properties of atoms, then the creature would not suffer when a needle touched a single atom. However, grant that it touches not one, but two atoms. Indeed whatever was said just now concerning the one atom, can be said now concerning two. For if neither of the atoms may be wounded by a needle, nor, if they were wounded, do they have the nature to feel the wound, then a person who was wounded would also be insensate and free from pain. For just as nothing additional would happen because of there being two, in the case of bones or cartilage or hair or some other insensate part – for two hairs are as insensate as a single hair – in the same way, I think that, if being affected did not succeed for the two atoms, then there will be no greater success in perception, if neither of the atoms is sensate. And if the needle were to touch three or four, by the same logic as with pebbles and stones and hair, so in this situation there is no greater success – neither in the creation of the condition of being affected nor in the creating of perception. For something composed of unaffected or of insensate things does not become sensate or able to be affected. It would be most amazing if, although none of its parts were being affected or perceiving, the entire thing became something which perceived and was affected. Given that there are two tools in the discoveries of such principles – the empirical and the logical -- according to neither of them is there found at any time a sensate and affectable composition from components which are insensate and unaffectable. Rather, if you were to combine many diamonds, or whatever least affectable things someone wishes, and attempt to inflict damage, whatever has been composed of them will not be damaged at any time, nor will it have sensation. And no such result will ever be found in any way by means of this experiment. And it was said a little before that no logic would allow this. Indeed, given that flesh suffers when it is wounded, how would it not be amazing if none of the least parts of it suffered or was damaged? And what reasoning would allow this? For I say, even if all the atoms possessed innate feeling, and they were nonetheless invulnerable and ultimately unaffected, constructing flesh only from intertwining with each other, then nothing more would happen when the needle came down. For just as, if you should interlace two fingers, which are sensate, with each other, no pain attends on their being separated and disentangled, by this same reasoning I do not think, if the needle should separate and disentangle the atoms from each other, that it would hurt one of them, nor would the creature suffer in any way. Rather, let them demonstrate that in the intertwining and separating again of sensate bodies there is any consequent pain at all. But based on observation they are unable to show this, and it seems absolutely impossible to those who observe rationally.

424-425. And indeed, assuming we grant sensation to atoms, if a painless separation were discovered by people considering logically and based on experience, and if somehow, in addition to this, the atoms were also to detect

the lack of sensation, would they then be capable of being pained? For being pained, as was said earlier, necessarily requires these two things, alteration and perception, occurring together with each other, but atoms possess neither of these. And, necessarily, even if you were to grant one of these qualities to the atoms, they still would not be subject to pain. For if they are unaffectable, but you grant that they are sensate, they still do not feel pain, because they have not been affected. And if you were to grant that they can be affected, but that they are insensate, then they would not feel pain, because they would sense nothing. For a thing which is to be pained, as has been said, must be affected and must feel the event of the affecting. Thus it is not possible for there to be something sensate composed of elements which are both unaffectable and insensate. Nor, indeed, composed of elements which are unaffectable as well as sensate. For this latter would also not suffer at any time, because it would not be affected. For although it would be sensate in capability, it would never actually sense anything in practice, just as our body, which is clearly sensate, in the same way does not sense anything before being affected by it. So, clearly, according to this account, the opinion of those who propose that the atoms are of uniform composition is refuted. For if some of the elements are sensate according to these people, but completely unaffectable, how can a sensate thing which is always unchanged feel something without having been affected? It remains, then, that the sensate body is either composed of elements which are both sensate and affectable, or out of those that are affectable, but not sensate. We shall see shortly which of these is true.

425-426. It has been clearly shown that a sensate body can not arise out of elements which are both insensate and unaffectable, nor out of elements which are both sensate and unaffectable. But what is common to both rejected schools of thought is a body made of unaffectable elements, and so the element is not single in form, if indeed it is not unaffectable. And here in a nutshell is the demonstration that one single thing is unaffectable: there is nothing into which an element which is one single thing may change or by which it may be affected. For something changing is changed into something else, and something affected is affected by something else. So how is the one single thing to be observed? Hippocrates concludes correctly that the element is not one single thing, if there should be any suffering by existing things. *"For there would be nothing,"* he says, *"from which something which is one single thing might suffer."* So the elements are most certainly more than the one single thing.

426-432. But it is still unclear what the entire number of elements is, so let us investigate that next. And perhaps it would be better to discuss first the two remaining schools of thought, which were noted above, and which have in common the concept that every body which is innately capable of suffering consists of alterable primary elements. For all four logically distinct propositions are found: firstly the proposition concerning elements which are insensate and unaffectable; secondly the proposition of elements which are sensate, but unaffectable (the elements being unaffectable is common to both of these – and having shown that this is impossible we have withdrawn from both propositions). But two remain: one asserting that the sensate body consists of primary elements which are both sensate and affectable, and the second that it consists of primary elements which are not sensate, but which are affectable. And what is common to these two is the idea of the sensate body consisting of elements which are affectable. We may know that – if between these choices one of the propositions is impossible, or if they are both equally possible – it remains to discover which of them is not only possible but is also really true. So you will discover, if you put your mind to it, that both of them are possible. For if you wish to test the parts themselves and

observe logically, all the parts of sensate bodies are sensate and affectable, as we said a little earlier concerning flesh. But if you were to examine the primary elements, it would be shown, if they are assumed to be insensate, but capable of acting on each other and of being affected, that a sensate body sometimes arises through many various changes in turn. For every composition made out of many things is observed to be completely like the things which are the components, and it acquires no further, newer, form from the outside which does not belong to the components. And if the components were to change completely, to alter and change in many ways, it would be possible for some property of a different kind to belong to the composition – a property which did not belong to the primary elements of the composition. Perhaps an example of this reasoning is needed for clarity's sake. Now, I say that a house constructed of stones and bricks and wood and tiles acquires no additional quality of another kind which does not belong to those things composing this house. For each of these things which are present in the structure possesses hardness, and also shape and color and weight and size. And the hardness and color and heaviness of the house are exactly the same as in the component materials. For the components are not hard, while the structure is soft; nor the components heavy and the structure light; nor the components red and the structure black. And the house also has shape and size, since the components making it up have shape and size, but there is not exactly the same size and shape with respect to the whole as for the components. However, it will not be investigated now, whether the house is larger than its bricks, or if it is elongated while the bricks are square, but, rather, if it has a claim to size and shape because its components do. Who does not know, then, how a straight diagonal divides a rectangular area into two triangles? And how from these two triangles coming together a single rectangle is completed? But both the triangle and the rectangle are shapes. And indeed two semi-circles placed together form an entire circle, so that we agree that one shape can arise from others, and not be dissimilar in kind. For shapes are capable of making shapes, and smaller sizes of making larger, but shapes are not capable of making sizes, nor sizes of making shapes, so that although it is not possible for something to arise out of elements of a different kind which have changed their qualities, it is possible for something to arise out of elements which have changed; for it is possible by many intermediate changes for something hitherto black in turn to become white, and something hitherto white to become black, and something now insensate to become sensate. Therefore, those who claim that some sensate composite body arises out of the fire and air and water and earth, out of these components as they metamorphose and mingle and change completely, are saying something which is possible. But those who claim that the elements remain the same, such as they are, and only mix with each other as if in a heap of wheat and barley and chickpeas and beans, are working at impossibilities. For this is not at all different from saying that earth, water, fire and air (or 'atoms' of these, as they say), when they come together, result in a sensate body. For it is not possible, if the elements remained unaffectable, that a single sensate body would result from many insensate things having come together. It has been shown, that nothing can come forth which is different in kind from its components; and sensateness is completely different in kind from shape and heaviness and hardness, which pertain to atoms, just as, further, it is different from the other properties which pertain to fire and air and earth and water. And for colors and humors and vapors and, to speak simply, all the other properties of bodies, there is a different kind of sensation, so that it is not possible for a sensate body to arise from atoms or fire or air or earth or water while these remain immutable and such as they are according to their own nature. So it is necessarily the case that something which is to be sensate is composed either

from sensate primary elements or from elements which are insensate, but innately capable of changing and altering.

432-434. Thus these things show that the elements are more than one, and that they are affectable. They do not show at all whether something sensate is constructed entirely of sensate primaries, or out of primaries which are not sensate; I say that both are possible. However, that there are, in any event, some primaries which are not sensate is clear from there being some such insensate compounds. And since this has been sufficiently demonstrated to those who have learned to follow the explanation one way or other, it would be best to take up next what we have sometimes said and what we have shown in many places in the writings of Hippocrates. So that, by giving one of these arguments which are of the same type, he entrusts it to us to set forth logically the remaining arguments which possess the same force as this one. And, what is more, even now it seems to me that the man acted thus, showing the impossibility of the opinion from a single observation, and leaving it for us to explain in various ways from arguments possessing the same force as this one. For one of the observations is that we suffer. And it has been shown that this cannot arise without our being affected. It thus follows from this that the elements are indeed more than one single thing, for one single thing cannot be affected, since there is nothing differing from it. So just as from suffering bodies, so also from bodies experiencing pleasure you can demonstrate the same point, and just as from them, so also from bodies feeling sensation, as I have purposely demonstrated further in many places in this account. And indeed, if neither pleasure nor pain belongs to unaffectable elements, then no feeling at all does; neither memory, of course, nor recollection, nor imagination – for feeling is a certain root of these, and like the source of all of them. And if none of these belongs to unaffectable elements, nor do any other psychical functions, just as the soul does not.

434-436. So the quickness of explanation used by ancient men is enough to cause amazement. For in the most concise expression, Hippocrates showed all these things and explained forcefully that the element is not one single thing. However, when we discussed these things, we saw how he connected this following passage to the afore-mentioned account. The entire passage reads thus:

> *And I myself say, if man were one single thing, he would never suffer; for there would be nothing from which he, being one single thing, could suffer. And even if he could suffer, the cure would necessarily be one single thing.*

He says that if man existed as one single thing, he would not suffer. And even if he did suffer, the cure would necessarily be one single thing. Following in the same mode of syllogistic figure, he also seeks an argument from the example of curing, just as he sought the one from the example of sufferings. For when he accepts that the second statement follows upon the first, and then, accepts in addition the contrary to the second statement, he reaches the contrary to the first statement in conclusion. For if man were one single thing, he would never suffer. But he does suffer, therefore he is not one single thing. In the same way, the argument is sought from the example of curing. For if man suffered as one single thing there would be a single method of curing. But there is not merely a single method, therefore man does not suffer as one single thing. So it is necessary here again to do as we have done above, and by showing that the second statement follows on the first, and that the contrary to the conclusion is well accepted, offer to the argument an explanation and much-needed certainty. We have mentioned, in the discussions on this topic, that if man were one single thing he would not suffer, and that if he did suffer,

the method of curing would necessarily be one single thing: you may particularly understand these arguments if you assume that something which is affected by nothing external may be affected by the remaining internal nature. For, given that there is a single internal nature for each thing, then there will also be a single experience of suffering. It would necessarily follow on this that there is also a single response according to nature. And this response would be curing. And just as there would be a single cure for someone suffering on his own account, so also there would be a single thing effecting a cure.

436-440. But there is no need for me to point out that everything which has just been said is clearly false. Rather, it follows from the first of the proposals, which Hippocrates has amply proven as being completely impossible and, no less from that proposal, he has demonstrated the idea he set forth from the beginning, namely, that it is true that if there were one element, we would not suffer, and it is not true that if there were one element, we would suffer. Just as he shows that the first proposal is refuted based on what logically follows from it, in the same way he proposes this: there is a single affliction, a single form of curing and a single thing effecting the cure. But there is not just one thing which effects a cure. Therefore the proposal that there is a single element is false. And it is manifest that there is not just one thing which effects a cure. For one person has been cured when he was warmed, and you may find another who has been cured no less when he was chilled, and if someone has been cured when he was made damp, you will also find not a few who have been cured by means of things which dried them. And if one person has been cured by means of astringent or bitter things, not everyone has been so cured before now; for there are those who have been cured by means of salty or sweet things. So also someone has been cured by means of things holding back the belly, and another by things which draw off from it; and one through things which compress, but another through things which disperse, and it is possible to say that one finds no general method of curing, whose opposite you will not also find. So he says correctly that there is not merely one thing which effects a cure. And indeed, from this premise and from the second statement, which he has taken from the premise, it has been concluded that there is not merely a single element, and the desired argument has been reached completely: if a man, existing as one single thing, suffered, the method of curing would also be one single thing. But the method of curing is not one single thing; therefore man does not suffer existing as one single thing. Thus we will no longer investigate what he has said at the beginning of the treatise, nor will we expound in a different way these things which are now clearly said, since we recognize here the entire thought of the man. But then he says:

> *Whoever is accustomed to listen to those who speak concerning man's nature – this account is not useful for him to hear. For I say that man is not entirely air, nor fire, nor water, nor earth, nor something else which is not clear existing as one single thing in man.*

When he says these things, we should not read *eneon* as one word, joining the letters and using a smooth breathing as many Hippocratics have done, but, rather, we should use a rough breathing and separate them into two words, *hen eon*, as if he had spoken thus:

> *I say that man is not entirely air nor fire nor water nor earth nor anything else which is not clear existing as one single thing alone in man.*

That the first argument for him is entirely concerned with there not being merely one element is shown, on the one hand, from what he said a little earlier, and on the other, no less, from what he immediately adds in the beginning after this passage written earlier.

> *For they say what exists is one single thing, and this is the 'one' and the 'all', But they do not agree with respect to what is named. One of them says that air is this 'one' and 'all', another says fire, another water, and yet another earth.*

Then next in turn: *"Some physicians say that man is blood alone, some say that he is bile, and some phlegm."* And then next, beginning to argue against them, he writes this first passage on which I expounded first, the passage which prevails generally against the physicians and natural philosophers, and next he argues specifically against physicians in this passage:

> *I expect that someone who says that man is blood alone and nothing else to show a man not becoming changed in his particular nature, nor of all sorts, but rather to show some time of year or time of a man's life, in which blood is evident existing as the sole element in man. For it is natural that there be one certain time in which this would appear existing as itself. And I also say these things with respect to someone who says man is phlegm alone, and with respect to someone who says he is bile alone.*

440-442. Then, having finished the argument, he continues by saying next:

> *Firstly, generation necessarily does not take place from one single thing. For how could one single thing generate, if it were not mixed with something?*

And then next:

> *So how is it likely for generation to take place from one single thing, when it does not even take place from more than one, if it should happen that they are not a combination well-suited to each other?*

And then next:

> *And since the nature, both of man, and of all other things, is such, it is necessarily the case that man is not one single thing.*

And then next in these words:

> *So, since this one differs from the others with respect to its specific nature and force, those things are necessarily not one single thing, just as fire and water are not one and the same thing.*

In all these arguments, and in the ones after them, he clearly contradicts none other than those who deem that the element is one single thing. Thus it is clear, that at the beginning of the argument he said that which we have expounded: that man is not air alone nor fire nor anything else, because it is not conceivable that there is one single thing existing in the body. And once more when he says:

> *Those who say that man is one single thing, seem to me to make use of this very idea: seeing some men who have taken medicines die in excessive purgings, while vomiting bile – and some men die vomiting phlegm – they suppose man to be that particular material which they saw him die in attempting to purge.*

He describes in detail from what occurrence some people are moved to say that man is one single thing, and then he writes arguing against them:

> *However, in the first place, in these excessive purgings, no one has died in some way purging bile alone.*

He says in the same way that man is not one single thing with reference to the other humors, concerning which, he has thereupon constructed the argument that the nature of man is not a single humor, that is, element, but is the four humors, which is none other than what was maintained in the beginning. For it is foolish – this opinion of the natural philosophers and physicians who say that there is but one single element either for everything, or just for man.

442-444. And it is more a matter of amazement that the people saying such things were in good repute among men, than it is a matter of doubting the counter-argument. But in the same way, Hippocrates attempts to argue against them, not making such a lengthy argument, but by means of a convincing opinion. For those who say that the element is one single thing have not used persuasive and unanswerable arguments, but they can be detected by their obvious and reckless absurdity. The ones who say that water is the element claim that it is the element in this way: because such an element becomes earth when it is concentrated and compressed, air when it is thinned and scattered, and fire if it is thinned and scattered even further. Those who claim air is the element say that it becomes fire when it is thinned, water when it is concentrated, and earth if it is concentrated even further. And those who claim earth is the element say that it becomes water when it is moderately scattered, air when it is thinned further, and changes into fire when it is excessively affected in every way; and thus they conclude that earth is the element. Those who claim fire argue in the same way, from it becoming air when it is compressed and brought together, and becoming water when it is more affected and more excessively concentrated, and resulting in earth when it is the most compressed; and they conclude that this is the element. And the absurdity of these arguments is obvious. For by the changing of the elements into each other, all the afore-mentioned theorizers believe they have not demonstrated the changing, but rather the particular one which each of them would call element. But speaking about the change of air and fire and water and earth into each other is not the same as speaking about the elements. For each of these is an element, not insofar as it is naturally able to change into another, but insofar as it is primary and most simple.

444-446. Plato, then, as well, has argued in the Timaeus in favor of this changing of the elements into each other, wishing to explain that one common material underlies everything. But although he has used this changing of the primary bodies into each other as someone who knows how to make a proof for an appropriate reason, on the other hand, Thales and Anaximander and Anaximenes and Heraclitus, each of them assuming some single particular one of these to be the element, attempted to demonstrate this from the elements' changing into each other. And all of them seem to me to be dreaming up this material which, common to all, underlies the elements, and, seeing this one single material, they seem to assume that there is one single element. Accordingly, it is proper to say that, if indeed that which is underlying everything (air and fire and water and earth) with a common material is the

element, then they have overlooked this element, and declared a particular one of the four to be the single element, all of them using an explanation with a common reasoning, but all of them not assuming the same element. Hippocrates scoffed at them for this very thing and clearly speaks in the beginning of the treatise in this way: *"They all make use of the same opinion, but they do not say the same things."* And then, following that: *"But,"* he says, *"they make the same epilogue to this opinion."* What might this epilogue of theirs be? We have said it earlier: the ones who claim that earth is the element, from which, when it is dispersed, water arises, and when it has been thinned further, air and then fire arise, conclude from this that earth is the element, and by the same logic the ones who claim that air is the element, and the ones who claim fire, and those who claim water – as I made clear above. So they all make a single epilogue to differing proposals, not, however, reaching the proper conclusion first. For it would be proper to say there is one thing which underlies everything else, and that it is a single substance, which, being common to all primary bodies, is underlying. But then, all the ones who do not recognize this attempt to give a single explanation for the four proposed elements; and Hippocrates expressly criticizes both these ideas in this passage: *"And they each add to the argument itself evidence and proof, which is nothing."*

446-448. In this next passage he is clearly demonstrating that they are speaking unproved nonsense and misleading themselves rather than reaching a logical conclusion:

> *For because they are all using the same idea, but do not say the same things, it is clear that they do not understand these things.*

In this way he shows the same point again: that all of them, as they attempt to give the same explanation for different and contradictory circumstances, do not understand. Whence also: "Whoever happens," he says, *"to have the most fluent tongue before the audience,"* seems to prevail in the argument, particularly addressing whatever the argument is at that time to their audience, most of them obviously uneducated and ignorant men. And on this account he observes correctly:

> *But these men clearly seem to me to overturn themselves in the words of their account, through stupidity, and to confirm the theory of Melissus.*

For Melissus himself claimed bizarre things in general, that there was one single unchanging and unaffected element; and those who say that air or fire or water or earth is the one and the all are basing their effort on these bizarre claims, and from these claims the argument of Melissus would appear to be proved. For if it is necessary for a choice to be made between two outlandish ideas, that of Melissus has a better chance of making sense; he has made this assumption from the beginning, and does not reverse himself in the exposition on it. For those who assume there is a single element for existing things, then recall, when they consider that there are four existing elements, the single element's change into these four. It would be better to propose that this one single thing be unalterable, if it truly is one single thing. For if it changes, how can it still be one single thing? So Hippocrates correctly says that all those who claim that air or fire or water or earth is the element are honoring the theory of Melissus, and further, that it is an outlandish theory describing reality strangely and contrary to every clear observation, so that refutation is not needed. And Aristotle argues further concerning the outlandishness of this theory in the first book of the *Physics*.

448-450. And indeed Aristotle seems to have constructed the structure of his arguments just as Hippocrates did. For he states clearly at the beginning (184b.26):

> *The consideration of whether what exists is single and unchangeable is not a consideration having to do with nature.*

Then, having demonstrated this, and for that reason saying that it needs no refutation, he has found that the theory of Melissus and that of Parmenides are both clearly outlandish, and argues against them as the treatise progresses. And Hippocrates labored under the same opinion. For, showing that the people who say there is one single elementconfute the medical art, and that this argument of his is not a useful thing for them to hear – in the same way he seems to be at odds with their opinion in what comes after this. And it is manifestly clear that the people who say that what exists is one single thing deny the fundamental bases of natural science, as Aristotle said, and the fundamental bases of medicine, as Hippocrates said. For natural science is concerned with bodies in their creation and destruction, and in their change generally. But if the only existing thing were one single thing, these concepts would be rejected. In the same way medicine exists firstly as a kind of attendant from birth and death, and if these things are not granted to exist, then medicine itself is completely denied. And since the methods of curing are many and varied, the people who claim, in the face of these, that there is one existing element are refuted. For either our bodies would not suffer at all, or, if they did suffer, they would suffer in one way only, so that there would be a single cure. But if this were true, clearly all medicine would be destroyed. However, as there are many cures, the task of the physician is to discover the cure which is suitable for each disease. But if there were merely one single cure and a single ailment in form, then there would be no risk of failure.

450-452. So Hippocrates said clearly and correctly at the beginning,

> *Whoever is accustomed to hear people speaking about human nature beyond the extent to which it relates to medicine – it is not useful for him to hear this account.*

And then he added, *"For I do not say that man is entirely air,"* that is, not entirely one single thing alone. For someone who argues beyond what is relevant to medicine is shown to be rejecting the fundamental bases of that art. Indeed, if there is nothing else, this at least must be agreed on by physicians – that there are many individual diseases, and many individual cures. Therefore someone who does not agree with this rejects the fundamental bases of medicine, so that his argument is beyond what is relevant to medicine. For someone who disagrees using arguments that contradict the fundamental bases of a given art is not an expert of that art which is denied, but is an expert of some other art, which should become clear to you from the passage of Aristotle which says (*Physica* 185a.1),

> *For that argument which denies its foundations does not pertain to geometry, but either belongs to another field of knowledge, or to a general knowledge of everything, so that it does not pertain to the physical.*

As for the people who deny what is clearly observed, either they should reject all men in general, since they are denying life itself, or they should propose some art which is debated beyond the foundations; answering all these foundations in turn, and thus throw out each of the arts, one after the next, which are based on the accepted foundations. And so Aristotle and

Hippocrates appear to have constructed their arguments in this way, but the exegetes have not followed closely. For it is not on this account that Hippocrates says that the argument is not useful for those accustomed to hear about human nature beyond the extent to which it relates to medicine, i.e. because he condemns those who assume that air, fire, water and earth are elements. Rather, from the beginning to the end, he is found to be censuring the people who say it is a single one of these, since it is exceedingly illogical that, because no one of the four appears purely in the body, they would all be doubtful. In the same way I know that someone might doubt that the so-called *tetrapharmakon* is composed from wax and pitch and resin and tallow, because none of them appears to be comprised perfectly and absolutely in this composition. And what should one say concerning things which are completely mixed with each other – how dry medicines, well-composed of cadmium and powdered antimony and dried bronze possess nothing still preserved of the simple pulverized components, nor is it possible to take some smallest part of them, in which one might see a single one of the afore-mentioned components pure and unmixed with another.

452-455. Moreover, just because in the bodies of living creatures none of the four elements is pure and absolute, we do not doubt the bodies are mixed from these. Nor do we agree on this account that the cosmos is made of these four elements, and yet exclude the living creatures from a genesis out of these, as if they had come from somewhere outside and were not born in the cosmos. Or are you yourself urging me to show you pure and unmixed earth in the bodies of living creatures, when I am not even able to show such an element in the cosmos? For whatever part of unmixed earth you take clearly possesses substances of some warmth and moisture and airiness – this part of unmixed earth which we suppose to be an element, because it is exceedingly solid and heavy and dry and cold. But you may point out to me such a stone in the cosmos as being an earth-like body, and I will point out to you the same type of bone and sinew and hair in living creatures. Of this type also is the so-called 'shell', belonging to hard-shell animals, which is dried and compressed precisely in the manner of earth so that if you were to search for earth in living creatures, you would be able to observe the same sort as in the cosmos, but you would not readily find it unmixed and absolute and alone, nor would you find it so in the cosmos, just as, of all the others, you would not find pure and unmixed water, nor fire, nor air. For all things are adulterated with things of a different type, and are mixed together and have a share in the others to a greater or lesser extent. But to those who are observant, the type of the prevalent component is apparent in the mixture. Moreover, one does not seek something unmixed in the bodies of living creatures, but let it suffice for you, seeing the cold, dry, compressed part, to recall the earth, and seeing the light, wet, flowing part, to be reminded of water. And let the great heat in the body remind you of fire, and let the nature of the lungs, without which a living creature cannot survive, remind you of air, and along with that, of fire. And you should not ask me for earth in itself in the body of a living creature, nor for anything unmixed with the others, unless you first show me wax in the *tetrapharmakon*.

455-457. For it occurs to me to wonder if you suppose that wheat and barley and acorns and figs and each of the other grains and fruits originate from earth and water, seeing clearly that their origin begins there. But do they not have any share at all of air or fire in the origin of their substance? Indeed, if you soak earth with water, you will have nothing more than mud. And none of the grains and fruits are this same mud, because they also have a share of fire and air through these being completely mixed with each other. But perhaps you agree that acorns and figs originate from the elements of the cosmos, since you

have seen their plants earlier, and the small seed of each cast in the earth – the seed which is not the ten thousandth part of the entire plant. And seeing all the rest of the substance having arisen from the elements of the cosmos, you are at a loss concerning living creatures, just as you are concerning the generated things mentioned above. For sheep eat grasses and pigs eat grasses and acorns, and goats, in addition to these, also eat the soft shoots of trees, and from these their blood is produced and the body is nourished and the fetus is established and increased. So goats and pigs and sheep have been produced out of the elements of the cosmos, but do the ones who eat them have either their first origin and increase, or their present nourishment, from something else? These are all illogical and unnatural ideas and filled with great ignorance. For all grains and fruits have been produced out of the elements of the cosmos, and living creatures are produced out of them, and nourished and increased, and it must be confidently demonstrated that earth, water, fire and air are the primary elements common to all things. For they are the primary and the most simple bodies of those in the cosmos. And all the others, the plants and animals, are composed of them, and in his book *On the Nature of Man*, Hippocrates is first to explain not merely that these are the elements of all the cosmos, but he is also the first one to determine the qualities of the elements – qualities according to which one thing acts on others and is affected.

457-459. Many people who do not closely grasp the idea of a 'homonym' as it relates to argument have been mixed-up and confused, such as Athenaeus of Attaleia, assuming that the elements of man are hot, cold, dry and wet, but at the same time saying that the elements are obvious and that a demonstration is not required. Although at one time they name these elements according to their qualities and powers, at other times they are anxious that air, fire, water and earth be agreed on as the elements. And even though almost none of the more recent physicians have completely overturned logic as it relates to the medical art as Athenaeus did, nevertheless each of these mistaken ones seems to be in a similar position with respect to these matters and to all sorts of others, as do all the rest as well. For I know no one who has pursued ancient medicine completely, or perfected it and completed the methods handed down to us by these men. But if the truth must be told, many of the things which were said correctly have been set aside, when Athenaeus says the elements are obvious and do not require demonstration. For does he prove the obviousness of the elements by a demonstration according to which the elements exist, or by a demonstration based on the substances with which they happen to exist? And if it is based on the substances, why does he not say that, for all men, both what is healthy and what is unhealthy is obvious and that no demonstration or teaching is expected on account of the obviousness? For indeed everyone recognizes bread and the lentil and peeled barley and flesh and the grain of salt and milk-and-honey, but whether each of these is suited by nature to harm people at any time or benefit them, they do not yet know; it would be in this manner that they would be either healthy or unhealthy. Thus, although people recognize bread and flesh and barley, they do not know these are both healthy and unhealthy. So also there is no one who, in the case of medicines, cannot perceive and smell and see and taste hellebore, squirting cucumber, scammony, dodder of thyme, iris, and helenios; but of these they do not know the beneficial ones or the harmful. And thus they do not know the healthy or unhealthy ones of these. Moreover there is no one who does not clearly recognize earth, water, air and fire with all his senses, but whether these are elements, is not merely something which most men do not know, but something which even some philosophers do not know.

459-460. But the followers of Athenaeus said, in the same way, that they would explain none of these matters, for this is beyond the medical art, and for

them suffice hot and cold and dry and wet, which can be clearly shown in animals, and these are taken as the elements of bodies and of all medicine. And shall I now examine how much nonsense it is to assume that hot and cold and dry and wet are the elements of the medical art just as they are of the animal? For this opinion has already been satirized by many people, and it even inflicted censure and no small ridicule and no slight distrust on the ancient account. For who has betrayed this account more than the one who, having said that the elements require no demonstration on account of their obviousness, thinks it proper to assume these are the elements of medicine and of living creatures. And I am resolved to show that it is a frightful thing to say that water and earth and air and fire name wet and dry and hot and cold, since that is none other than having homonyms for the sensation; not so that I might disprove a defeated Athenaeus, but so that I might prevent the rest from erring as he did. And I will demonstrate claims by the results, since nothing is proved, and no opinion is meticulously established, without logical consideration. Swearing by the gods in truth to tell the things which have happened to me as they occurred I will attempt to describe them in detail.

460-461. When the teacher of these things first attempted to teach me the opinion of Athenaeus, I expected that he would carefully tell me all about the homonym, for I did not expect to know according to what underlying concept he uses 'hot' or 'cold' or one of the other such terms.

461. "For", I said, "'white' is said to be the color itself. For we say that white is one of the colors, and black, and red, and yellow, and brown. And, in addition to these are the bodies possessing the colors. For we call the swan and milk 'white', and the raven and the Ethiopian 'black'. Thus", I said, "I hear people saying 'hot' sometimes in reference to the body itself, as if it happened to be fire, and sometimes with reference to its quality alone. Therefore", I said, "I do not know, when you say 'hot', what you clearly intend then – if it is the quality alone, or the body possessing it."

And he very readily replied to this, admitting that he named not only the quality, but the body as a whole, as 'hot'.

462. And then I asked again, "whether you are telling me, then, that this body is the element, because it would be hot to the utmost, or, were it moderately hot, would it be an element?" And similarly, I posed the same question concerning 'cold' and 'dry' and 'wet'.

"Why does this matter to you?" he said. He was already confused, and did not answer so readily as before.

"Because there is a great difference," I said, "whether a limitless number of elements is assumed, or a finite number. For the number will be limitless for those who assume that what is moderately hot, or cold, or dry, or wet is an element, but it will not be limitless for those who assume that an element is what is hot or cold or dry or wet to the utmost. For there will be a single kind for each so that the total number of elements will be limited to four."

"Suppose, then, that there are four," he said.

"Then it is clear," I said, "that these are utmost and simple and primary in quality."

"Why are you still bothering about this?" he said

463. "Because," I said, "I would like to consider carefully what is said."

"But", he said, "that is what I am saying: suppose it to be so."

"What are you telling me to suppose?" I asked again, "that what is hot to the utmost or wet to the utmost is an element?"

He was already so provoked and flustered that he said, "Whatever hot dominates, I call a hot body, and I call that wet and dry and cold, in which each of the aforementioned dominates and has a larger share."

"And so," I said, "nothing hinders naming in this way. For bread is called 'hot', and lentils and peeled barley, and a bath, but I do not suppose that you expect me to consider each of these an element, but rather only the utmost hot; so also the utmost cold and dry and wet. For the element must necessarily be simple and unmixed, not already composed or combined."

"Then suppose it to be so," he said, "I would not say peeled barley and lentils are elements."

464. "Indeed," I said, "if I were to consider the perfectly hot body to be an element, I would at once think of fire, and nothing else."

"So, consider fire," he said.

"Are you willing then," I said, "for me to consider water to be the perfectly wet body in the same way?"

He yielded this point with great difficulty.

"After fire, then," I said, "we come again to air and water and earth, from which we withdrew at the beginning."

"For you," he said, "are confusing the account," and then, looking at the other students, he said, "this person, turning to dialectic and from this having become infected with mange" – for so he called it – "this person has turned everything upside down and twisted it about and has confounded us with his tricky arguments, in order to show off his weapons of logic. So he comes expecting us to consider the 'hot's as homonyms, the first as a quality, just like the color white, and the second as a body perfectly exhibiting this quality, and third, that of such a quality based on predominance."

"But," he said, "we are not accustomed to refute sophistry. Therefore, let he who has devised the sophistry thus refute it."

465. These things happened to me when I was nineteen, and I was silent for most of the remaining lecture so as not to appear contentious, but then I myself closely examined the other topics on my own, and the argument concerning the elements.

465-467. I marveled that Athenaeus did not perceive that he was contradicting himself, when he named 'hot and cold and dry and wet', but denied saying 'fire and air and earth and water' (for this is what he does say: 'For I understand the former as the properties of animals, not as the common elements of all bodies'. And they call 'properties' those things which are particularly individual and belong to no other things. In the beginning passages I said in a general way that the observed elements are completely different from the elements in actuality. But now it seems appropriate to me to speak concerning these larger ones for this reason. For if the element is the smallest and simplest part, it would be contrary to perception to say simply bones and sinews and ligaments and nails and hair and fat and flesh and teeth and marrow and neck muscles

and membranes and all the uniformly composed materials are elements of the human body. Has Athenaeus perhaps postulated that these are elements? And indeed he is the one who writes that each of the uniformly composed materials arises from the primary elements, while the other parts of the creature are constructed out the uniformly composed materials. Indeed if he happened to be asked about the elements of flesh or of fat, it is clear that the hot and the cold and the dry and the wet are distinguished. And he will say that in the same way wet and dry and cold and hot are the elements of bone and sinew and hair. Thus it is proper for you to inquire now what kind of wet or dry or cold or hot is shown. For, based on predominance, flesh is wet and sinew is cold. And in the same way bone is dry and cold, but fat is wet and hot, and each of the other uniformly composed materials are one sort or another, based on the predominance of the simple elements. Thus, if someone should show that an element is hot or cold or dry or wet based on predominance, will it happen that bone and tendon and sinew and such others will be the primary elements of the human body?

467-469. However, Athenaeus does not say these are actually elements, but rather that their components are. Thus it is clear that he disregards perception with reference to primaries and truly simple things, as he goes on with the argument, primaries which it is no longer allowable to say become this or that based on predominance. But, again, grant that these are compounds and we will be doubly mistaken in what is appropriate; because we have withdrawn from what can be sensed as we search for what is simpler, and then we still do not obtain this simple thing in what is unobserved. For in what is observed, if nothing else, what we agree on is, at any rate, taken for granted. At least, there is no one who would not say that the primary and simplest parts, based on perception, are sinews and fat and membrane and all the other uniformly composed materials. But for someone who rejects these because based on nature they are compounds, although they may appear simple to the senses, and who says nothing of simple things – what elegant defense could be made so as not nonsensically to say excessive and frivolous things? For if you define wet and dry and cold and hot based on predominance, you clearly have the elements already known – the tendon and membranes and sinew and ligaments and flesh and each of the others of which we have spoken. But if you seek what is simple, based on nature, it must necessarily be that which is unmixed and unblended and utmost in quality. And so you come again to fire and air and water and earth. In these alone will you find the qualities unmixed and unblended; the utmost heat and dryness in fire, the utmost coldness and wetness in water, and in each of the others according to their particular natures. And if you did not want to say that there are four elements, but rather two of them, or three, you will quickly have plenty of figuring to do. And it is extremely foolish on the one hand to agree that the utmost wet is an element, but on the other to say you suppose it is something other than water, if you do not therefore say that these same qualities alone are elements, and that they are not observable bodies. For in this way water will not turn out to be an element, but wetness will; fire will not, but the utmost heat will.

469-471. And if this is so, then, firstly, whoever persists in going on in these matters, so that they are far from the subject of medicine, will ascend above fire and air and water and earth; and secondly, he will clearly be proved as not knowing how an element differs from a first principle. For it is agreed on by all the philosophers, whom Athenaeus was eager to follow, that the utmost of heat is simpler than fire, and fire comes into existence when this heat is innately present within matter. Indeed, it is agreed on that the first principle of the genesis of fire is matter, which underlies all the elements and is without quality, and the utmost of heat innate in matter; similarly it is also agreed on

that matter exists continually and eternally, being ungenerated and imperishable – but that what is generated and destroyed is the quality of this matter, and it is necessarily the case that the element is akin to whatever may possess the element. For an element differs from a first principle in this way, namely, that first principles are not, of necessity, akin to the results to which they give rise; but elements certainly are akin. For a simple quality is an element of a compound quality, and a simple body is an element of a body which is not simple. And indeed, if hot and cold and dry and wet are defined in three ways – either as qualities or as unmixed bodies or as mixed bodies – it is clear that the quality is not an element, nor is the mixed and blended body; what remains is that the pure and unmixed body is an element which is simple based on qualities. So again you come to fire and air and water and earth; in these primaries are the utmost degrees of heat, coldness, dryness and wetness.

471-473. And on this account it is excessively silly to be afraid to argue that these are elements because we cannot somehow remove them from the body they are in, nor put them into a body. For indeed, since we assume bodies which are generated from elements, of course we also assume elements for our bodies. But these are not unmixed, they say, not single. So it is incorrect to say that an element cannot be removed or added: for one should not simply say it this way, but say, rather, that it is not single and not unmixed and not by itself. However, why then should this be limited to these conditions? For the theory concerning the elements is naturally not considered useless, just because we display none of these elements unmixed with something else in our bodies. Nor are fire, air, water, and earth incorrectly called elements, just because we make use of things generated from them, and because it is the case that each of them alone, in its own particular way and according to its own terms, is altogether unusable. However, we often make use of the pure elements of the cosmos: drinking water daily and bathing with it and using it in other ways, and the air surrounding us on every side, which is drawn in through breathing. And indeed, when we have been chilled, we want fire. Therefore I do not know what, then, they are accomplishing – the ones who say that something does not take fire and air and water and earth out from the body and does not put them in. For I, at any rate, say that in the chill, fire enters into the body of one who is warmed beside the fire, and whoever drinks water – water also enters into his body, and so by the same logic for someone breathing air. And indeed such creatures as feed on sand or earth or stone or mud or bones – clearly these take in earth. And if, because someone beside the fire is not warmed to the point of being burned and someone does not drink to the point of bursting, – if on this account they do not believe any of the elements enter our bodies, one must marvel at the wisdom of men not able to understand up to this point, that if any one whatever of the elements were destroyed, the creature would at once perish. For if it were completely consumed by fire, the cold element would be destroyed, and if it were completely chilled, the hot element would be destroyed. And thus, if you were to completely dry the body, you would thoroughly destroy the wet element, and if you were to make it completely wet, you would destroy the dry element. So that this is the opposite of what they say, and one of the elements is always removed and is added. This occurs in a balanced way for those who do not wish to destroy the creature, for the unbalanced use of these elements results in destruction.

473-476. I will attempt to reveal everything that is encompassed in this account (*On the Nature of Man*), and, in particular, what others overlook. For all bodies which are such that they have a beginning and an end are subject to two changes: that of their substance being altered, and of it dissipating. It is altered when it is heated and chilled and dried and made wet. These qualities alone change the whole substance in its entirety, as will be described in a little

bit. It dissipates with respect to the so-called imperceptible exhalations, so that, in order to be preserved, a two-fold restoration is required; the one restoration curtailing what is excessive in these qualities, and the remaining restoration supplying the foundation of what has been drained. However, the quality which is purifying the imbalance is opposite to that quality which is in excess, and the quality supplying what is missing is not opposite, but must be very similar to the substance drained earlier – for it must enter the creature in place of this drained substance. And thus it happens that bodies are nourished from some substance similar to the one which was drained. Whence I think we also call this substance 'nourishment'. But when we desire only to alter what is underlying according to quality, we call the means by which we accomplish this 'medicine', not 'nourishment'. And, as we are unable to find substances separate from the individual quality accompanying them, we are compelled, if we desire the utmost qualities, to add to bodies that very element which they lack – fire or water or earth or air – by taking on these substances; but if we desire moderate qualities, then we will add a mixture of elements. Thus, when we wish to be heated we take a sort of medicine in which the proportion of fire is greater than that of its opposite; when we wish to be cooled, we take a medicine in which the contrary holds. And it is the case that, by choosing to act in both ways – to be altered and to be nourished – we seek a substance such that it possesses the function both of food, as it were, and of medicine. For they must not expect every creature to exhibit earth or water or fire or air as a single unmixed element, on its own, without the others. And this element need not be exhibited as food or as medicine. For food is similar to what is nourished; and I suppose the other (i.e. medicine), which is similar to the compound and well-mixed body possessing all the elements, is such a sort as is born of all these (i.e. elements). Thus the element is not always useful as medicine, but only at that time when the body requires an utmost quality. I say these things in opposition to those who do not understand Hippocrates correctly, and it is already clear that we always require elements, sometimes as simple and single, sometimes as well-mixed, but at any rate composing for us this body which will be needing nourishment or medicine.

476-480. It will become very clear to you from these passages that Hippocrates, in the book *On the Nature of Man*, often names the elements from their qualities, terming as 'hot' not only the quality, and that which has the same name based on predominance, but also that body possessing the utmost heat; and terming as 'cold', the body in which the utmost cold is present; and as 'dry' that in which the utmost dryness is present. For when he says:

> *And again it must be that each departs into its own nature when the body of a man dies: the wet to wet, the dry to dry, the cold to cold and the hot to hot*

he does not mean only the qualities dry, wet, cold and hot alone, but the substances in which these qualities are present. For when the body of a man dies, these substances depart and are intermixed with the elements, but, although the qualities may be said to perish when the creature dies, they are not said to depart into a specific nature. And again, speaking about the aforementioned elements, Hippocrates says,

> *Such is the nature of living creatures and of all other things. They all arise similarly and come to an end similarly. For their nature is constructed out of all these aforementioned elements and finishes with these, in that condition from which each was constructed, and thus into which each has departed.*

It is manifestly clear here that he is not referring to the qualities alone – hot, cold, dry and wet – but to the elements. For the origin of all bodies is out of these, and the conclusion of all bodies is back into them. And I expect you to be still mindful of this fact which has escaped the notice of many physicians who think that Hippocrates avoided declaring that these elements are present at the origin and destruction of all bodies. In fact, four times in this passage which we have here at hand, he has used the names of all the elements, and also earlier, when he says:

> *However, it is necessarily the case, with such an underlying nature for all other things and also for man, that man is not one single thing.*

And in these words, then, he seems to be using the terms in this way. But many physicians who call themselves Hippocratics overlook this, still thinking in these matters that he said that wet and dry and cold and hot are something else, not that they are the elements common to all things. That he did not wish to propose their qualities as the elements of these bodies I think is clearly shown in the passages I have already cited, and not least in this one:

> *And again, if the hot does not compare to the cold, and the dry to the wet, in a balanced and equal proportion to each other, but instead one greatly dominates another, and one is stronger compared to another which is weaker, then generation does not occur.*

For he does not believe that generation of living creatures arises out of qualities alone, which indeed are unable to exist apart from bodies, but rather, that generation arises out of those bodies which clearly exhibit the qualities to the utmost. For these are the elements common to all things, but those which are called hot, cold, dry, and wet based on predominance are specific to each thing. Now, I will go through the account as it applies to humans: a human is made of primary and simplest elements called uniformly composed material: muscle and membrane and flesh and fat and bone and cartilage and ligament and tendon and marrow and all the others, each piece of which has the same appearance as any other piece. These arise, in turn, from certain other elements with their own characteristics – blood and phlegm and the two biles, yellow and black, whose origin is from what is eaten and drunk (which has in its turn been generated from air and fire and water and earth), and these are not made of other bodies, but from matter and qualities. And on this account we say the 'first principles' of fire and air and water and earth, not the 'elements', but these same ones are the elements of all other things. For the smallest parts of all the others are simple and primary. No one with a brain would disagree that all the grasses and plants, and the fruits from them, have their origin out of air and fire and water and earth, nor would someone disagree that these are food for all living creatures, nor that the humors apparent in the body according to nature arise in us from these things. As for the questions, 'what are the humors?' and 'how many humors are there?' – we will put the second question aside as we investigate this work, and attempt to focus on the first one.

481-484. For each uniformly composed material arises from these humors, and when these materials combine with each other, the primary and simplest organ, which is generated by nature for a single function, comes into being. When these organs, in turn, combine with each other, another greater organ is generated, and when these greater organs are then interwoven with each other, the construction of the entire body comes about. But these are spoken about in the anatomical handbooks. And indeed, I have written in particular about how Hippocrates was knowledgeable with regards to all that is observed in

dissection. And now we propose to discuss further the elements which escape the senses, concerning which Hippocrates expounded in his *On the Nature of Man*, saying that the elements particular to and characteristic of our bodies are the four humors, but the elements common to all things are wet, dry, cold and hot. For he names the elements from their qualities, and through these qualities, the elements arise. For by means of matter, when there is an utmost innate heat, an element will come into being (i.e. fire), generally, and according to the same logic for coldness and dryness and wetness. And an element is not distinguished by being yellow or white or black, or light or heavy, and, by the same reasoning, it is not distinguished by being thick or thin or scanty, or by pinching or splitting or bruising, nor, to speak simply, by some other quality apart from the four already mentioned. For these qualities alone, as they alter the underlying substance by changing into each other, are the causes of elements and the craftsmen of plants and animals. Thus, that the elements change into each other is agreed on by the followers of Thales, and yet already it is at odds with their hypotheses, as has been shown. But what already follows from this assumption – the assumption that some substance common to all the elements is underlying – Hippocrates has already shown in this one passage, which I have cited at the beginning, in which he says that we would not suffer if indeed man were one single thing. I said that this passage, in its brevity, teaches both these things: that there is more than one element, and that it is their nature to be changed. Now then, we ought to take this up in turn, so that we may now set out the conclusion belonging to the first point. For, since by its nature the substance can be altered, let us next see what qualities are capable of doing this. So Hippocrates, as he uses old-fashioned brevity in the course of saying that, if man were one single thing, he would not suffer, next has already used 'hot' and 'cold' and 'dry' and 'wet' in contrast to all the other sorts of qualities, and from this being the case, he accepts that nearby bodies seem to change into each other by their nature, through heating or chilling or drying or wetting. From this he knows that it has been shown that the idea of the entire substance being altered is overthrown, seeing how the observed alteration of bodies is not separation and combination, as the followers of Epicurus and Democritus think, and, in another way again, as Anaxagoras and Empedocles; the one group introducing uniformly composed materials, the other supposing that the four elements are unchangeable.

484-486. But we will work at unfolding the account into something as much clearer as it is more convincing, and an account such as this will result: if we suffer, our form is not one and our substance is not unaffectable. And indeed if it is affected, it is when it is heated and chilled and dried and made wet that it is affected, since none of the other qualities is such as to alter everything that is near them completely. For if something heavy is near something light, or something light is near something heavy, the light thing will not become heavy nor the heavy thing light. Nor will there be an alteration if something rough is near something smooth, nor if something solid near something rarefied, nor if something thick is near something thin. None of these such qualities are able to alter everything near them completely. Soft and hard, and slick and brittle remain to be considered. But surely of these, soft and slick are part of the nature of wet things, while hard and brittle are part of the nature of dry things, and there are no other tangible qualities besides these. And it is quite clear to everyone that an alteration of matter is not associated with visible or audible or taste-able or smell-able qualities. For with respect to kind, there are tangible qualities, and there are those qualities which differ from all the particularly tangible ones in that they neither are combined in all the kinds of living creatures nor do they completely alter the underlying substance. And if these specific qualities belong to some living creatures, but, in changing and altering the entire substance, they are primary to nature and common to all existing

things and are craftsmen of the elements, then it is clear that wetness and dryness and cold and heat come together as the substance of every existing thing. Thus Hippocrates is correct in saying that the nature not only of man, but of everything else as well, is composed out of hot and cold and dry and wet. For clearly these things act in each other, as everyone agrees, and they are not able to act from separation and combination, but from being affected and changed through their entire substance.

486-487. It occurs to me to marvel at Athenaeus saying neither these things now being discussed nor the things which Aristotle or Chrysippus posited, but expecting perceivable elements to be assumed without explanation, although in these matters he contradicts Asclepiades; and to marvel how he recalls these things: not recalling everything precisely and not recalling them assertively, not in order and using a logical method in his counterarguments, but rather he mangles these things in a disorderly way as he recalls them. So to him it is acceptable to recall these things while destroying Hippocratic physiology, but this is the right place here for me to finish with this first point. For other elements, unaffected by these qualities, which belie the schools of thought assuming substance, as well as the schools devising nothingness, are discussed by Aristotle and Theophrastus, and we may mention them particularly as we argue against each of the schools. But although these arguments are plentiful, what has been said now is sufficient for a knowledgeable explanation.

487-489. Now, saying the substance must not be changed throughout its entire self is no contradiction, for by this change we would abolish pain and pleasure and sensation and memory and calculation and the soul itself, as no other quality is naturally able to change through entire objects apart from the four we are speaking of. And if this is so, Hippocrates also seems to be first of all to discover the elements of the nature of existing things and to have explained them sufficiently. And if he had not written this treatise about the elements, as Asclepiades the physician did not, then this investigation would be nothing. For all the works of the ancients on nature are ascribed – the ones of Melissus and Parmenides, and of Empedocles and Alcmaeon, and of Gorgias and Prodicus, and all the others, and Aristotle, in his works *On the Heavens* and *On Coming-to-be and Passing-away,* perfects the theory concerning the elements just as Chrysippus in his work *On Substance*. But neither of these wrote books concerning elements nor is it necessary to seek an author's name, but rather to scrutinize the power of the arguments. For if someone had written the treatise we have here now concerning nature and concerning the elements and concerning birth and death and concerning substance, there would be, I presume, nothing different. In this respect it is more usual now for almost everyone to write such treatises concerning the elements and to name them generally thus; and it seemed better to us to write about the elements according to Hippocrates. And indeed I fancy that I have completely finished with the first argument. For even if somehow some small thing from what has been said by Hippocrates had escaped without being expounded, each one of these people whom I have mentioned would have been inspired to discover this easily: that there cannot be a genesis from one single thing, and that if hot and cold, dry and wet do not relate to each other in a balanced and equal way, but one greatly dominates the other, the stronger dominating the weaker, then genesis will not take place. For he teaches here concerning their symmetry and equality with respect to force, in addition to which we, also, in our work *On Mixtures*, have scrutinized them, as well as in other works in turn.

489-491. And indeed, how the mixture is mixed in general, whether it is of qualities alone, as Aristotle assumed, or of bodily substances going through each other, is necessarily not known by physicians. Whence Hippocrates did not expound anything concerning these topics, but was satisfied with this idea

alone – that the elements are mixed generally. We made use of this for the work *On Mixtures*, which I discuss next, and moreover, the work *On Medicines*. It will be fully spoken of concerning the usefulness of these things in *The Therapeutic Method*, and in the present work it will suffice to say this in regards to the established theory: that since, in his book on the elements, Asclepiades had said these things about entire substances completely mixing with each other, people who say they are mixed only in their qualities understand nothing. So, if for no other reason, at least out of caution one should pick and choose this teaching – just as in the mixing of wine with water, if it should happen that the parts of each are dispersed into the smallest parts, and they are affected in each other, then it also happens that they exchange qualities with each other more readily, the more the mixture is dispersed into smaller parts, and for this reason, when people mix such things with each other, they agitate them as quickly as possible to cause a division into the smallest parts. And indeed, that the qualities of things which are mixed further and for a greater time, subsist even more in each other, agrees with the theory. For the small parts of substances, when they are mixed together, require time in order to act on each other and be completely affected and in this way result in one single whole, similar to itself in all respects. It holds by these ideas also that some of the mixed materials separate from each other again, as long as this separation is immediate. But if the mixture lasts for a long time, so that everything is made one, it is impossible for one component to be divided and separated from the other. But it will be spoken of concerning the manner of complete mixture in the writing *On Medicines*.

Book Two

492-493. This is a good time for me to move on to the second topic. For Hippocrates, having shown that the common elements of all existing things are hot and cold and dry and wet, next passes to another kind of element which is neither primary nor common, but particular to creatures with blood. For blood and phlegm and yellow bile and black bile are elements of the origin not only of man, but of all creatures with blood. The smallest parts particular to man are called the uniformly composed materials. And there is a commonality of these materials with some parts of creatures with blood such as the horse and cow and dog, and other animals like these. For all these have arteries and veins and sinews and ligaments and membranes and flesh, not all of them exactly like man's, but some different with respect to kind, as hooves and horns and spurs and beaks and scales. Thus, just as hot and cold and dry and wet are the common elements of all things, then by the same approach the particular elements of each of the animals are the primary parts according to the senses, concerning which the anatomical handbooks speak. Between the former and the latter we have the four humors, and each of the other animals has that which would be the matter of their 'proximate origin'. For this is what they were accustomed to term an origin, from whose primary change something arises which requires no other intermediate changes.

494-498. Thus, it is clear to everyone that all the parts of animals with blood originate out of the blood of the womb. Since that blood has a share of phlegm and of the two biles, those who say our origin is from blood alone and those who say it is out of the four elements are distinguished here with good reason. And the truth cannot be demonstrated here in the same way as it was demonstrated concerning the primary elements. Each theory possesses something persuasive. Hippocrates, in response to these, thinks the truer theory to be that the four humors are the matter of the origin of man. I will attempt to demonstrate the origin, starting from this very point. Flesh and sinew are uniformly composed material. But flesh, possessing blood, is soft and hot; in contrast to it, sinew, being bloodless, is hard and cold. Indeed, flesh

is not perfectly soft and hot, nor is sinew perfectly hard and cold. But the blood of flesh is softer and hotter, and the bone of sinew is harder and colder. Each of the other parts is like this – one is colder than another, one hotter, one softer, one harder. Is it the case that all things thus arise from the same substance, or, rather, that nature, who is an excellent craftsman, when it produces the first thing out of the blood in the womb – blood which flows into the womb – and shapes it into the embryo, draws the thicker material out of the blood into the construction of the harder bodies, but draws the wetter material into the construction of the softer bodies? So also does it draw the hotter material into the construction of hotter bodies and the colder into the construction of colder bodies? This seems to me to be a far more natural thing, and according to the first principle the fetus is shaped straightway and in all the time after these events, each of the parts takes its nourishment and increase out of its own particular matter. And blood appears to be one single thing as also milk does, but the theory teaches that it is not one single thing, just as milk is not. For in milk, the utmost whey-ish material is light and the utmost curd-ish material is thick. And these, so long as they are mixed with each other, make milk a medium between curds and whey, but when they have been separated, they exhibit their own particular qualities, and this shows the nature of milk: how it is not, strictly speaking, one single thing, but is composed of contrary and differing things. So just as in milk there is whey and there are curds, so in blood there is a sort of ichor of blood, analogous to the whey of milk, and a sort of slime analogous to the curds. And indeed the fibers carried in the blood can be clearly seen and when these are removed, the blood does not coagulate, and it differs in both color and composition. For in one instance blood appears extremely red, and in another is yellower than that, and in another blacker. And it is the case that sometimes something white clearly forms on it and then the entire thing appears livid and, by God, often almost black, just like something dyed deep purple, so that blood is not, strictly speaking, one single thing. For I suppose that blood would always be the same in all animals and humans, if it were actually one single thing.

But sometimes there is an abundance of something thick and black in it, so that the skin of the entire body appears blacker and the scars blacken and the veins of the thigh are made varicose, along with a certain livid color; but sometimes it is something yellow, so that this can be seen from the hair and the skin over the entire body and from purgings and evacuations. And sometimes it is red or white, so that this can be seen from the color of the entire body, and of the hair and the purgings and the evacuations. And indeed if you should cut open the veins of men who are still healthy – out of one man the blood will flow yellow; out of another, red; out of another, whiter; and another, blacker. And if you should wish to give the body a cathartic medicine, it will drain that humor which it is suited by nature to draw out, but not equally in every nature of the body neither of healthy nor of sick men. And I will begin the discussion here with sick people: when the bile is pale and called yellow, if you give a purging medicine to jaundice sufferers, you will have it draw out bile of every kind. But if you should give this same medicine to those afflicted with what is called white-phlegm-ish dropsy, it will drain a very small amount of bile. Still again, if you give another medicine, by which phlegm is drained by nature, it will draw the smallest amount of phlegm in those who are jaundiced, accompanied by great harm – but it will draw a great deal of phlegm from those afore-mentioned dropsical patients without doing any harm. And indeed we have often given something which purges black bile to 'elephantious' patients, from which we see a draining which appears to be most rapid and plentiful, with great benefit.

499-501. Asclepiades, who attempts to overturn logically the good points of the discipline by means of amazing corpuscles and ducts, tries to persuade us that each medicine does not draw out its corresponding material, but that it changes and turns and alters the corrupting material – whatever sort has been drawn out – into its own nature. Then he says that the benefit which ensues comes about not because of the cleansing out of the offending material, but because of the general principle of draining. Thus Asclepiades' account is shameless when compared with the evidence. This evidence holds as was said earlier, as Hippocrates has thought, as well as all the remaining physicians who examined it with great care. For if you should try to give a medicine which draws phlegm to a bile-ish man, know well that it is with no small harm that you will test this teaching. Indeed, if purgatives are of benefit only in that they cause draining, why do we not open the veins of all patients – whether thin or plump or jaundiced or melancholic? But although the draining of an offending humor has conferred no small benefit on many patients who are quite thin, on the other hand, if someone dared to draw blood from these patients, he would kill them straightway. But the corpuscles and ducts and the discrete elements force Asclepiades to say these things, for it follows from these assumptions that no quality of our nature is out of place, nor is any quality of the excess material drained out daily through the belly, but whenever the belly retains food, according to this reasoning we are being harmed by an excess, and the cure is either a reduction in food or a complete fast. Further such arguments eagerly disputing in support of Asclepiades have been ventured, and these arguments on the one hand cause those who are ignorant of the evidence to be puzzled, and, on the other, those who are knowledgeable to be astonished and amazed at the shamelessness of the man. But it will be spoken fully in other texts against the boldness of Asclepiades. And we again take up the evidence clearly, following the sayings of Hippocrates, since he did not divine that some physician might be as inexperienced or shameless in this as Asclepiades, who is entirely ignorant of the smallest parts of the field or else who knowingly denies that he is ignorant. Whence, I think, the argument becomes stronger in support of us through the counter arguments against these shameless claims, and in support of Hippocrates, who wrote a short, abridged, demonstration without all the preparation so that nothing would be conjectured and then mistaken, or denied.

501. And speaking against those who say man is blood alone or some other single thing, he is satisfied in expecting them to show

> *man not changing his particular material nor becoming of all kinds, but rather to show some season of the year or time of a man's life in which blood appears to be the one single thing. For it is likely (he says) that there would be one time in which the one single thing, whatever it is, would be apparent on its own.*

502-503. In reference to the two biles (the pale and the black) being mixed in the blood at all times, and in addition to them, in reference to the third, phlegm, being mixed, he has gone over the evidence in the times of a man's life and the seasons of the year according to nature.

> *For if you give to a certain patient he says, medicine which draws phlegm, you will have him vomit phlegm. And if you give medicine which draws bile, you will have him vomit bile. And (he says), if you cut some part of his body, so as to make a wound, blood will flow from it. And all these things will occur for you every day and night, winter and summer.*

And in reference to these things being the nature of the body, that is, all of its parts being born and nourished from these, he says these things:

> *It is clear that man has all these things always in himself first, as long as he lives, since he is created of a human possessing them all, and since he is nourished in a human possessing them all, as I myself say and demonstrate.*

And if someone were to discard the shamefulness of Asclepiades, he might sufficiently demonstrate the proposed idea. For if each of the cathartic medicines draws a certain humor, and there is no time in which, having given one of these medicines, you will fail to have the corresponding humor drained out – given this, it is clear that there is no time in which man does not have a share of the four humors. But, in addition, man's origin was out of the blood of the womb, blood which is not pure, but mixed with phlegm and the biles. For every man is shown to be possessing these things in himself at every point in time. If, therefore, man originated out of these things, and has his increase and nourishment out of them, then these are his nature. And these are the main points of the argument.

503-506. He teaches some of the aforementioned things, one after the other, in the book concerning changes according to times of life and seasons of the year, and he gives no small assurance that each of the cathartics draws its corresponding humor and that man requires all of the aforementioned humors. Indeed, what happens in the case of over-purging immediately demonstrates that each of the medicines draws its particular humor.

> *But (he says) when someone takes a medicine which draws bile, he first vomits bile, then phlegm, and then, on top of the bile, those who are forced to it vomit black bile, ending up by vomiting pure blood. And they suffer these effects (he says) from medicines which draw phlegm. First they vomit phlegm, and then yellow bile, then black, and finish up with pure blood, and thus they die.*

And this passage says the same thing. It is clear that one may conclude that each of the cathartic medicines attracts its corresponding humor. For whenever a creature, weaker than its normal self, is overwhelmed by medicine, so that it is close to death, at that point the draining of the first humor gives way, and the draining of the second humor succeeds it. However, according to Asclepiades, one of two things must be so: either a humor is never drained, or it is drained continually from the beginning. And when the medicine which has been given is not weaker in any respect, and is doing what it is suited by nature to do, then that which it drained out from the beginning would necessarily be the only thing carried off. For it would not be satisfactory that the first humor would somehow disappear and change into that very one which the drug draws by nature when the body was still strong, but the medicine would no longer be able to act on the humor at the point when the body had become weak. And yet indeed it is clear, that it does act. For no lesser amount is drained out in these cases, and the body is undone and perishes. So how is it that the humor which is drained no longer appears similar to the humor drained before? It is for no other reason than because almost all this earlier humor has been drained from the body, so that the creature's body is no longer able to live, with a certain one of its elements completely destroyed, but it is undone and perishes and pours out whatever of the remaining humors would be more readily drained. So on this account, if the medicine should be one which draws either black bile or phlegm, in over-purgings the humor of yellow bile follows, since it is hottest and lightest. But if the medicine should be one

which draws yellow bile, in over-purgings it will next draw phlegm, and then black bile will be drained. For this is heaviest and thick and hard to move. But blood is the last of all to be drained, since it is particularly akin to the nature of man.

506-507. And on this account, some physicians and natural philosophers declare that the living creature is born and nourished from blood alone, and one must commend this idea of theirs as an idea of people who think reasonable things. But Hippocrates says something still more natural: that our bodies have their birth and increase and nourishment from these four humors, and, at the same time, as was said earlier, since he observes that for healthy people a manifold diversity of the particular nature of their bodies would not come about if there were one element-like humor, and then, since he does not ignore the entirely different natures of the parts of the body, he says they did not arise straightway at the beginning from a single substance and do not use one single nourishment in form. All these things I have said here, Hippocrates has shown in this passage, saying,

> *For just as plants and seeds, when they go into the earth, draw each single thing in the earth to themselves according to their nature (the sour and bitter and sweet and salty and all the rest) – it first draws to itself more of that thing which is most akin to it by nature, and then it draws the others. Medicines do the same such thing in the body.*

Through this account he has taught us carefully concerning feeding, and concerning draining in purges, which it will be necessary for me to discuss further in the treatises On the Natural Powers. And moreover here we look only at the main point: natural power is a certain power which attracts those things akin to it, just as the power in magnetic rock attracts iron, and through this power both the processes of feeding and catharsis are completed with it always drawing what is akin, whenever that is abundant; and, along with this, this power often also draws such matter as is not akin to the cathartic medicines. For when it drains out all of what is at the surface, either bile or phlegm – this how I refer to what is excessive in the veins – it further draws the corresponding moisture which is remaining out of the solid bodies, by force and painfully, undoing, and, as it were, elementalizing and destroying the creature. And in the excessiveness of this drawing some of the humors follow, the humors which correspond next by nature to what is drawn by force.

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