

3. MOVING TO THE NATURAL

Let us revise a little. We began with a consideration of the three levels of abstraction under which one may consider an artificial thing such as a table, the second more abstract than the second, the third more abstract still. The scientist deals at the first level where he considers the various elements of the materials that go into the table and reveals their make-up from his observation of their sensed qualities. The geometrician or the mathematician deals at a higher level where he abstracts the table's shape and structure. The philosopher takes a step further away still when he considers what are the ultimate constitutives of the table taken as a being, an exerciser of existence.

The table, we concluded, has two intrinsic causes, the one (the form) determining it to be what it is— a table rather than a ladder, a boat, a chair or a door—, the other (the matter) that which is determined, the wood, the steel, the glue and so on that, melded together result in the existing table. This distinction is re-enforced if we consider that one might dismantle the table at some stage and, using the same materials, construct a ladder or a chair. The one set of materials can be re-arranged according to a various formalities.

Now this division into metaphysical elements (form and matter) is no less true when we consider natural things. However, there is a difference. We *know* intimately the things we make, the artificial. We know them because we are, so to speak, their author. But we are not the author, or maker, of natural things and so we do not know what it is that distinguishes one natural thing from another. We know that water differs from air, that dogs differ from cats, that horses differ from cows : we can recognise very quickly the differences in their formalities and can place each into its appropriate category of natural things, but we do not know the realities according to which they are distinguished. Save for one instance, man. We know this one natural reality because we are men ! We are, so to speak, immersed in this one natural formality. We know we are animals, but animals with a difference, animals possessed of intellect and will.

Now John Pat and Julian have raised an objection to what I said last lesson. “How can air have form ? How can water have form ?” They are good questions. Before I answer it I will relate a parable.

Back in 1983, they had just introduced a wide bodied jet passenger plane called a Boeing 767. In Canada, in the summer of that year, the pilot of one of these planes was to fly from Montreal to Edmonton. The powers that be had just decided to move from Imperial measurements to Metric. There were some problems with the aeroplane's instrumentation and, while the pilot thought he was loading, say 2,500 kg of fuel for the flight, the refuellers provided 2,500 lbs of fuel, which meant that the plane was provided with only 45% of the fuel the pilot thought had been loaded. The result of this and other compounding errors was that the plane ran out of fuel with 79 people on board at 41,000 feet. The story had a happy ending and you can read all about it, and how the pilot managed through his particular skills to bring the plane down safely, if you conduct an internet search under the title 'Gimli Glider' (he landed the plane at a disused airstrip at Gimli in Canada). The lesson of the parable is that when you are discussing some matter you must be sure that you and the one you are speaking with are both talking about the same thing.

When I use the word 'Form' I am using it in a technical sense proper to philosophy. To re-enforce the point this schema will illustrate—

Form is not the [shape
[proportion
[size
[behaviour
[structure, or
[function - of the artificial or natural thing. Rather,

Form is what determines its [shape
[proportion
[size
[behaviour
[structure, or
[function.

In short, form is what determines a thing to be that thing, whether natural or artificial.

Therefore, both air and water have form. For without its proper form oxygen will not be oxygen; without its proper form, water will not be water. It doesn't matter that neither have shape or apparent structure. One may say that the shape of water is determined by its container, a bucket or a dam, for instance. And there is a principle, the principle of receptivity, that governs this peculiarity and we will address it in the next lesson or two.

The next thing for us to note is that natural things are immensely more complex and intricate than anything that man may make. This gives rise to interesting considerations about their forms.

Take the apricot tree at the back of the house. It is what it is because it has the form of apricot tree. But the tree was not always the way it is now, some twenty years old and producing fruit year by year. Originally, it was the size of an apricot seed—you have all seen them when you have eaten an apricot. Then, after germination, it was a seedling. Later it was a sapling; and later still, some seven years or so after it was 'hatched', the tree reached maturity and began to produce fruit for the family. But all through those years it had just one form, this form determining it to be, and to grow into, what it is now, a mature tree. We give a particular name to the form of living natural things and we will come to that name and to what it signifies in due course.



But, now let us consider air ; or better still, one of air's major components (since air is a mixture of gases), oxygen. The form of oxygen, technically a mineral (a non-living natural thing), manifests itself in the smallest that oxygen can be. The scientists, on whom we rely since it pertains to their discipline to study the structure of the elements, tell us it is the molecule, signified by the formula O_2 , comprised of two atoms. This form is found in every molecule of the gas, so that in a cubic metre

of oxygen there are countless molecules all separately enjoying the same form. A volume of oxygen has not, like the apricot tree, one form only. Every molecule in the volume has the same formality. What can be said of the totality of oxygen in the volume can be said of the single molecule. It is the same with water. The form of water inhabits the very smallest that water can be, the molecule signified by H_2O , two atoms of hydrogen combined with one of oxygen.

Joe has asked how it can be, if form is what makes a tree to be a tree, that there are *many* trees. Why is there not just one ? The answer lies in the influence that matter brings to the compound ; matter individuates. *This* tree differs from *that* tree primarily because it is constituted of different matter. While form is a principle of unity in things, matter is a principle of their diversity. This issue (of the one and the many ; of be and become) was one of the first great issues in Greek philosophy. Parmenides of Elea (c.515-440 BC) thought that all the diversity the senses perceived was illusory. Being is one, the diversity only apparent, he claimed. Heraclitus of Ephesus (c.545-480 BC) thought that everything was in a state of flux, that nothing was the same as itself for an instant. It was in a state of constant change (a view replicated by Charles Darwin in the 19th century AD). Plato (427-345 BC) thought that there was but one real form of every individual thing and we were like people looking into a cave with reflections of the one reality (a tree, say) appearing on the back wall. It took Aristotle to resolve these apparent contradictions. How he did so will be the subject of a later lesson.

Now I should say a word about substantial change. The scientists tell us that oxygen and hydrogen combine to form water, and students can perform an experiment that demonstrates this. Two gases combine to produce a substance, a fluid, of a completely different nature, water. The cow eats grass and converts it into milk. The boy eats bread and meat and his metabolism turns into the boy ! One element or natural compound is transformed into another. The substance of one becomes, after the change, the substance of another.

We will have more to say about substances.