

WHAT DOES SWEDENBORG'S *PRINCIPIA* CONTAIN FOR NATURAL SCIENCE?*

To answer this question in a satisfactory manner would require many days. We would have to spend an evening like this on every chapter. So the answer that I will make to this inquiry to-night is but a fragment. I shall have to content myself with mere statements of the most conspicuous benefits which a student of natural science may gain from a careful study of the work before us.

In entering upon the discussion of this subject it will be eminently proper, as we have for the present dropped theology and are talking upon a strictly scientific basis, to clear our minds with a definition. It will be necessary at the outset to bring distinctly before us the nature of science, in order to understand in what a real benefit to her really consists. Therefore we will begin our talk with this definition: Science is classified knowledge. We notice that science consists of two essentials: knowledge, that is, things known—facts, observations—and organization of those facts. Since the facts of the *Principia* are the scientific facts of Swedenborg's own day, it is evident that the value of the book before us cannot lie in them. Hence we must look for the answer to our question in the classification which it contains. This will necessitate our reminding ourselves of a few things about the nature of classification.

The number of different ways in which we can classify any given set of facts is practically infinite. For example, suppose you were called upon to classify a room full of people. You might classify them by their height, by the color of hair or eyes, by their nationality, by their occupations, or in many other ways. Having this picture before us, we note three facts. The first is, that before entering upon any

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classification whatever, you invariably have some plan of organization present in your mind. For example, if you classify by nationality it might be because your plan was to find out how many of the people could talk German. The second is, that there are degrees of organization, some being more superficial, others more natural. The third is, that the benefit to be gained by any classification depends on the original plan of organization. Let us illustrate this with our room full of people. If we classify them by height or the color of their eyes, has anything been gained? Surely very little. If we classify them according to their professions has anything been gained? Surely something, for is not this organized labor which is recognized as beneficial? Though this is a useful classification, is it the ideal one? No; for are not men engaged in professions distasteful to them, not in accord with their natures? Hence all such classifications are in a way arbitrary. An ideal classification recognizes some general principle of nature as its centre and foundation. Thus when we come to recognize that the fact that man was made in the image and likeness of God means not only that each individual man is so organized, but also that each nation in a greater degree, and each world in a still greater degree, and the entire universe in the eminently greatest degree, are, when rightly understood, built on the same plan, when we fully grasp the meaning of this, I say, what wonders may we learn of the laws governing the life of a single man from viewing the life of a nation! How are we aided in our understanding of the life of a nation by observing attentively the life of a single man!

But I am wandering from my strictly scientific standpoint and must return. What points have we established thus far? To the three mentioned above, which were: First, that before making any classification there is always a pre-arranged plan of organization; second, that there are degrees of classification; third, that the amount to be gained by any classification is proportional to the degree of the

classification ; we have added a fourth which is, that the ideal system of classification is one which makes all facts revolve about one grand central principle.

Every one instinctively recognizes these principles of classification. In fact, it is the life work of every scientist to try to formulate a few general principles which shall govern all the facts of scientific observation. This he does by first forming a theory based on a few observations. He then collects all the facts which bear on the subject, compares them with each other, modifies the original theory to fit certain stray facts which do not fit into his original conception, till he finally arrives at a theory that will embrace as many facts as possible. But note that in this case, too, the plan of organization goes first, the coordination of the facts comes second.

How a new classification of old facts according to some new plan may totally revolutionize science is to be learned from the history of every branch of study. The science of optics, for instance, was retarded in its progress some hundred and fifty years because Sir Isaac Newton adopted what is known as the corpuscular theory of light and based his work upon it. So great was the influence of this giant of science that humanity made no progress in optics for nearly two centuries, till Thomas Young conceived the wave theory, and proved it to be the correct one. The same is true of electricity. As long as the study of electrical facts was based on the old fluid theories, progress was slow, till a Faraday introduced a new theory, and a Maxwell put that theory into usable mathematical form and, behold, the wonderful growth of electricity since. Thus I might go on indefinitely giving instances of the value of the theory back of all scientific classification to show that the progress of human science is in direct proportion to what we have defined above as the degree of the classification.

The ideal science, then, is the one whose plan of organization is most ideal ; whose centre and foundation is some

grand principle such as the one given above in connection with our room full of people. This, in brief, is the meaning of the *Principia* to science. It is an ideal classification because it contains a grand plan of organization of the universe founded on one simple universal principle.

There will be time, I think, to give a brief outline of this principle, and the conclusions that can be drawn from it. The principle as stated by Swedenborg, is this: "Nature is similar to herself in things greatest and in things least." We also meet it in the form: "Thus in the Macrocosm we see the Microcosm, and in the Microcosm we see the Macrocosm."

Now what does this mean? In the first place it means that there are degrees in nature, in that we have greatest and least, and, having these degrees, it means further that the plan of organization throughout them all is the same. But let us illustrate by an example how we may have different degrees with the same plan of organization, using for this purpose our friends, the room full of people. Looked on merely as a number of individuals, they are all of one degree. If, however, we organize these individuals into a corporation, using as our plan of organization a man's body and the uses which its own members perform for it, we have another discrete and higher degree. Thus we select some of the individuals to be the eyes of the corporation, others for ears, others for heart and lungs, etc. And so we get a larger man built up from smaller men, the architecture of the organism being in both cases the same.

How familiar this all is! Every one recognizes what is known among readers of Swedenborg as the doctrine of the Grand Man. The principle which we have mentioned as the centre and soul of the *Principia* has precisely the same meaning for matter that the doctrine of the Grand Man has for men. Hence it might rightly be called the doctrine or principle of the grand universe, for, according to it, atoms are images and likenesses of the infinite universe, just as man is the image and likeness of God.

It were much easier for me to go on now into details and show how a spiral motion is chosen as the most perfect motion, and how by composition of spirals on spirals particles are formed from and by the infinite Creator through that spiral motion ; I might make diagrams to show how any one particle is itself formed from smaller particles, and how it subsequently takes, in a larger particle, a place similar to that in which it holds a smaller particle in its own structure. This I say, were easier for me, if not for you, than to refrain. But time forbids, so I must go on to the conclusion which is this : Suppose all this be so, what then ? Are we any better off than we were before ? When we apply what was said at the beginning of our talk about degrees of classification, we see that we are better off, for have we not a classification that unites all the universe of matter under one grand principle ? Hence we have here an ideal classification, and, since it is ideal, the benefit to be derived from it must be infinite, as we have shown above.

But, you persist, is not such a classification too ideal to be of any practical value to scientists in this practical age ? Does it explain facts better than the old theories ?

It does. The rotation of the moon, in that it revolves once on its axis in the same time that it revolves once about the earth, is a necessary consequence of the philosophy of this book and not the rare coincidence that science makes it.

The mechanism of gravitation is explained by this theory in a way that is both sound, that is, explaining all facts, and yet thinkable, which can be said of no other attempted explanation.

According to the *Principia*, matter, as it became more and more compounded, became more and more inert, so that such material things as we see about us are the most inert of all. This derivation of matter necessitates the conclusion that the less compounded a substance is, the more powerful and free it is. This allows a reasonable conception of how germs, for instance, can have so wonderful a make-up that,

though the chemist cannot distinguish between them, yet one grows into a rose, another into a cabbage, another into a tree, or another into a bush.

These are but three of the facts of science that are better explained by the theory contained in the *Principia* than by any other hypothesis. There are many more. In reality I am convinced that all facts when worked over in the light of the plan of organization before us must come into this same category.

But besides explaining facts more satisfactorily than other theories, the *Principia's* greatest benefit to science lies not here, but in this, that one who accepts this view of creation finds, not a universe of dead matter as science would have it, but a universe with an infinite Creator at its centre. He finds this infinite Creator's infinite life filling His universe at every instant. Thus the world becomes, under the touch of this wonderful book, alive with infinite life. Every stone tells its history of spirals of spirals and spirals on spirals. Every grain of dirt, even, is an expression of life, not of death. This philosophy does not attempt to reason back from a lifeless matter to inert atoms with certain hypothetical "inherent properties." Nor does it postulate vortices full of energy with no definite thinkable first cause; but in a perfectly clear and rational way it gives us as the origin of our world infinite God with his infinite Life; it gives us as the daily support of our world infinite God with his infinite Life; it gives us as the end of our world, infinite God with his infinite Life.

Thus it leads us into a world of life, not one of inert matter; it turns us away from, not towards, materialism; in the words of Swedenborg himself: "The greater worshippers of nature we are, the greater worshippers of the Divine we may become." Can any man-made theory equal this?