

often appear to flaunt common sense, but they ultimately become the new common sense, exposing the fallacies in older ideas as they explain appearances in simpler and more beautiful terms.

The men who achieved the greatest advances in the mental exploration of space were of many kinds, but they had two characteristics in common: doubt and faith. They doubted enough to keep their minds from being blocked by cherished ideas that might be antithetical to what they were trying to discover. They believed with all their might that the universe was subject to laws of perfect order, and that any appearances of caprice could be resolved. They worked hard to achieve this, struggling with their own prejudices as well as with other people's old ideas and incorrect observations. And they emerged triumphant, reaping rewards greater than any of the creature comforts that they denied themselves for the sake of their cause.

They discovered planets.

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## LECTURES ON THE PHILOSOPHY OF SWEDENBORG'S *PRINCIPIA*

GEORGE DECHARMS

### LECTURE V. LIGHT AND HEAT, THE ETHER AND THE AIR, THE FORMATION OF SEEDS

We have described how, according to the philosophy of the *Principia*, the natural sun was formed within the volume of the first aura—how, at the surface of an expanding center of first finites active, the bullae of the first aura were crushed, and reduced to a hard, resistant substance called third finites. These third finites formed a coating or crust around the central space of first finites, and by the impact of that active center were caused to vibrate at tremendous speed until they became a mass of fiery incandescent gas which appears to us as the sun. We have seen also how, from the third finites as a covering, or shell, enclosing a minute center of second finites active, the second aura was formed, extending in a vast vortex around the sun, conveying but tempering the heat and the light of the sun to reception at the surface of the earth. Finally we have seen how, from the crust of flaming gas at the surface of the sun, the planets, satellites, and asteroids were thrown

off, each to find its own orbit, and to be carried round the sun on the bosom of the second aura. The distance of each earth from the sun is said to be proportional to the size of the planet, or its mass, those that are smaller remaining nearer to the sun, while the larger ones find their orbit at a greater distance from it. It should be noted that this theory is not borne out by astronomical observation. Mars, for instance, which is smaller than the earth, is farther from the sun. Obviously, there are other factors than size or mass that combine to determine the distance of a planet from the sun; but so far as I am aware, modern science has offered no explanation of these factors.

Modern scientific theories as to the formation and the structure of the solar system differ widely from that which was proposed by Swedenborg. Present-day thought is based on tangible evidence alone. Astronomers have no knowledge of a solar atmosphere in which the planets float, such as Swedenborg describes as the second aura. There being no scientific evidence of such a vortex, it is assumed that the planets rotate in a vacuum. Light is supposed to pass from the sun to the earth through this vacuum, at the absolute speed of a hundred and eighty-six thousand miles a second. This light, as it is received at the surface of the earth, seems to consist of wave-motions of varying length. These can be accurately measured, and waves of specific length produce light of a specific color, as may be seen in the rainbow, or the spectrum. Not only this, but waves of light invisible to the human eye, yet demonstrable by other means, are found to extend beyond both ends of the spectrum, being known as ultraviolet and infra-red.

Judged on the basis of our sense experience, waves would seem to require some medium in which the activity takes place. A wave in a vacuum would appear to be a contradiction. To meet this difficulty, and explain how light can reach the earth from the sun, a theory has been suggested that it may consist of minute pellets, travelling from the sun at tremendous speed. Neither the wave theory nor the pellet theory, however, satisfies all the observed facts, from which it is apparent that, although we know many things about light, and can apply that knowledge successfully in many ways, no one has yet discovered what light is.

In regard to this Swedenborg says that the active center of the sun is like a living soul, in that it expands and contracts alternately, and thus, as it were, breathes. This animatory motion sends a

pulse through the whole mass of the surrounding aura, and thus imparts a constant activity to the entire solar system. Thus we read in *The Economy of the Animal Kingdom*:

Undulation is the mode of propagating local motion once begun, from one distance to another, and hence even to the remotest. This we may see exemplified in water and other liquids, which when disturbed by any percussion, when touched or moved by any living force, immediately from the disturbing points as from a center evolve situations and spreading circles; whence this species of motion has justly obtained the name of *undulation*. We may see it exemplified in air; for when a string is made to vibrate, such as that of a harp; when a membrane is struck, such as the parchment of a drum; when a volume is propelled, as when air is blown through a horn, a pipe, or the trachea; immediately we find that from the first disturbing point, as from its center or axis, the air is rolled forward to a distance,—a motion which is properly called *modulation* . . . so also is that general modification, which by the organ of sight is recognized as illumination, and which probably arises from the animatory motion or animation of the solar ocean, or of some star, continually exciting itself into an undulating motion, and which effuses itself beyond the bounds of its own proper universe. (EAK Vol. I, p. 126)

Something similar is also taught in the Writings. Speaking of the correspondence of the heart and lungs with the will and understanding of man's spirit, which latter are said to have a corresponding cardiac and pulmonic motion, we read:

These two motions, the cardiac and the pulmonic, exist and persist, because the universal angelic heaven both in general and in particular is in these two motions of life. And the universal angelic heaven is in them because the Lord, from the sun where He is, and which is from Him, pours them in. That sun acts these two motions from the Lord. And because all things of heaven and of the world depend on the Lord through that sun in such nexus born of form that they are a concatenated work from the prime to the ultimates, and because the life of love and wisdom is from Him, and all the forces of the universe are from life, it is plain that the origin is none other. (DLW 392)

Elsewhere in the Writings the source of heat and light is described as follows:

From the sun of our world auras and atmospheres proceed as from their fountain; these are called ethers and airs. From this source (that is, the sun) nearest about it is pure ether, at a greater distance from it are less pure ethers, and at length airs; but these ethers and airs are around the earths. These ethers and airs, when made active in mass (*volumatim*) produce heat, but when modified in their least parts (*singulatim*) give light. Through these the sun exercises all its power and produces all its effect outside of itself, thus through ethers and airs by heat as a means, and at the same time by light as a means. (AE 726:3)

May this teaching have some bearing upon the unresolved scientific question as to whether light is a wave motion or is produced by tiny pellets? The bullae, or "least parts" of the ether may be compared to pellets; yet when these are modified by expansion and contraction, may they not also produce a wave motion?

It is evident, from what has here been said, that Swedenborg derives the origin of heat and light in the natural world from the living animation of the Lord's love and wisdom, operating by means of the spiritual sun, and producing the expansion and contraction of the natural sun which pulses through the entire solar system.

The *Principia* describes the creation of two other atmospheres through which heat and light are transmitted from the sun to the earth, namely, the ether and the air. These two, he says, arise not directly from the sun, but from the surface of the earth. The fourth finites, of which the central mass of the earth consists, are tightly bound together, and held in by pressure on every side. Only at the very surface of the earth are they set free from this confining pressure, and are thus enabled to move freely. Here they are caught up in the gyre of the first aura, which is interstitial throughout the entire volume of the second aura, and are formed into a shell which encloses a tiny volume of the first aura. Thus they rise up from the earth as if by evaporation, and this in such enormous quantities that the earth is somewhat diminished in size. Yet, because it is constantly rotating on its axis, the loss of these fourth finites does not change its shape. The atmosphere thus formed extends to a height of many thousands of miles above the earth, and embraces the moon, which is said to be carried around the earth on the current of this atmosphere, or ether, even as the planets are carried around the sun on the current of the second aura. The bullae of the ether differ from those of the higher atmospheres, because, instead of enclosing a volume of active finites, they enclose instead a volume of the first aura. This fact alters their shape from an orb flattened at the poles to one that is perfectly spherical.

The ethereal particles are much larger than the first and second elementary particles: the two kinds of particles differ also in this respect, that the ethereal possess an internal space consisting, not of actives but of elementaries, while the first and second elementary particles consist of pure actives, as we have before stated. Consequently that the two kinds of particles are

not similar in figure, but that the ethereal are exactly spherical, while the first and second elementaries have poles, or polar cones. (*Principia*, Part III, Chapter 5, p. 279)

The air is said to consist of fifth finites, likewise rising up from the surface of the earth as a sort of evaporation. They are larger, grosser, and indefinitely less active, or slower in movement, than the fourth finites. They are, however, caught up by the second aura, and form bullae, each of which encloses a minute volume of that aura. This atmosphere is heavier than the ether, and it rises above the surface of the earth to a distance of no more than a few miles, becoming thinner or rarer in proportion to its height. Concerning the air, it is now known to consist of gases, which do indeed rise from the surface of the earth. To this extent modern science confirms Swedenborg's philosophy. It is, however, found to be a mixture of a number of different gases. Oxygen and nitrogen together account for about 98 per cent of its volume. The remainder is made up of a number of other gases in various proportions, and these proportions differ in different places, and under different conditions. Whether there is anything beyond the air that might be called an ether has been cast into doubt because all efforts to prove its existence have been negative. Nevertheless, quite recently, some scientists of note have again raised the question as to whether there may not be some such atmosphere.

This much is certain: there must be media of communication between the Infinite and the lowest ultimates of creation. It is to provide for such media that the Writings proclaim the existence of successive atmospheres, three in the spiritual world, and three in the natural world. In his *Principia* Swedenborg speaks of four atmospheres, one above the natural sun, and three below it. The universal aura, being above the natural sun, must proceed from the spiritual sun. There is no other source from which it can be derived. For this reason we believe that Swedenborg, in his own mind, ascribed to it the properties and attributes of love and wisdom. We have been asked how we can think of the first aura of the *Principia* as a spiritual atmosphere, when it must be regarded as filling inter-stellar space, and as conveying light from distant stars. To this I have no satisfactory answer. I would only point out that we are faced with the same apparent difficulty by the teaching of the Writings. There we are told that nature

begins with the natural sun. It follows that any medium pre-existing the creation of the natural sun—any medium in which and by means of which the natural sun was brought into being—must be spiritual, since it transcends the realm of nature. Since natural suns have been formed, and probably are being formed in enormous numbers, the medium in which they are formed must fill interstellar space. Nor do the Writings anywhere, so far as I know, give the slightest indication as to how light is transmitted from distant stars. We must await further study before attempting to answer that question.

Both the Writings and the *Principia* speak of the ether and the air as atmospheres that do not arise directly from the sun, but take their origin from the earth, and extend only to a more or less limited space around it. I have wondered whether there might not be a parallel in this respect between the spiritual and the natural atmospheres, namely, that the universal atmosphere extends from the sun as its center, while the more local atmospheres arise from the earth. May not the two lower spiritual atmospheres, in which the angels of the lower heavens dwell, arise from the living spheres of angelic life, as if from an "earth," in a manner corresponding to the way in which the ether and the air arise from the physical earth? This is merely a conjecture based on the assumption that there is a close parallel and correspondence between the process of spiritual creation and the process of natural creation. I know of no definite teaching of the Writings, however, to substantiate such an hypothesis.

Considering the question as to why scientific exploration has failed to give any proof that any atmosphere exists beyond the realm of the air, I wonder if we are not thinking too grossly of these higher atmospheres. Are we trying to picture them too naturally in terms of the air, which after all is the only atmosphere of which we are sensibly aware, and the only basis, therefore, on which we can imagine higher atmospheres? Swedenborg in the *Principia* speaks of the ratio between the atmospheres as being in the neighborhood of ten thousand, or possibly a hundred thousand. Professor Allen has pointed out that atomic forces, electronic forces, and nuclear forces are differentiated by an increase of power and velocity unimaginably great, and far exceeding the ratios suggested by Swedenborg in regard to the atmospheres. May it not be true that the natural atmospheres, the ether and the second aura, are

so immensely more active, more tenuous, more subtle, that they cannot be discovered by any known scientific means? Supposing this to be the case, surely the fact that we cannot demonstrate their existence should not lead us to deny the revealed truth that there must be a succession of media, through which there may be unbroken communication between the outmosts of nature and the Infinite Creator.

The function of the atmospheres is not only to provide a chain of connection and communication from the Infinite to the outmosts of creation, but also to bring down the Divine life itself, so tempered and moderated that it may operate effectively on successively lower planes or degrees. By means of them the activity of the Infinite is stepped down gradually, in a manner that might be illustrated by the way an electric current is reduced from a high to a lower voltage in adaptation to particular needs and uses. We learn from the Writings that all the atmospheres, both those that are spiritual and those that are natural, contain living forces within them. These are of three kinds, namely *active*, *creative*, and *formative*, or as elsewhere stated *creative*, *formative*, and *productive*. These are the forces which, acting together in harmony, create all the living organisms on the earth, and also produce all the visible tangible phenomena of the spiritual world. The *active* forces are those of the Divine will, and the Divine foresight, immediately present to create uses. The *creative* forces are those that create souls, or seeds, whereby this Divine will may be focused or directed to the production of a specific organism. The *formative* forces are those whereby the necessary materials are selected, gathered, and ordered from the substances of the earth to produce organic bodies within which the soul may live. The *creative* forces in the universal aura produce the seeds of human beings; those in the magnetic aura produce the seeds of animals; and those in the ether produce the seeds of the vegetable kingdom. (Concerning this see DLW 191-194, 200-201, 307-312; AE 1201-1210)

Now what shall we say of these forces present in the atmospheres? Of course they are un-created, because love itself is un-created, and all the activity and force that proceeds from it is un-created. Yet it is obvious that these forces are not infinite. They are focused, like rays of light, in a particular direction, and channeled with minute particularity to produce a specific kind of living

organism. A seed is the life force that produces a kind, a species of plant, or animal, or human being, with all the distinguishing characteristics that set it apart from every other kind or species. From one kind of seed only one kind of plant or animal can grow. In each case, the creative life-force is limited and finite. These forces, as they exist in the atmospheres, therefore, are spiritual uses, the very uses which are said in the Writings to exist before the organs. We can think of them only as uses in the mind of God—as Divine intentions to produce those things which are foreseen to be necessary for the creation and the perfection of a heaven from the human race. They are the very “things” of which the kingdom of heaven consists, that is, affections, thoughts, loves, and perceptions, whereby God makes himself known to men and angels. They took on concrete forms from the substances of the earth before any human beings were created, and thus provided a world of flora and fauna in the midst of which human beings might live. They provided sustaining food for the body, and delights for the physical senses. And at the same time they provided food for the spirit of man, and heavenly delights, because they contained within themselves a soul of spiritual love and wisdom, of good and truth, which the human mind was created to perceive within the outward bodily form and shape. In other words, man was so created that he could perceive the *use*, the Divine end and purpose, for which these organic forms were brought into being, and so doing could see the kingdom of heaven, and within this the love and wisdom, the mercy and providence of the Lord. So long as man lives on earth, these spiritual and Divine qualities can be seen only subjectively, as if within his own mind. But in the life after death these qualities, these uses, become objective. Only through the medium of human minds can they become objective, and for this reason, the phenomena of the spiritual world did not come into existence until there were human beings to perceive, that is, spiritually to sense and feel these realities of heaven. Because all idea of form must be derived from physical sensation and experience, man must be born on earth, and dwell in a material world, before he can awake to spiritual consciousness, and enjoy the wonders of the spiritual world. And because all appearances in that world are derived from the memory and imagination of earthly objects, therefore it is said that the phenomena of the spiritual world exactly represent and picture forth the changes of state in the minds of spirits and

angels. Nevertheless, these spiritual things, these uses, were present in potency in the atmospheres long before there were any human beings to perceive them. From them, as we have said, arose all the material organisms of plants and animals that adorned the surface of the earth before the first human beings were created. The phenomena of the spiritual world are not created in the minds of men. They are not merely projections from them, like insubstantial dreams and visions. They are objective spiritual creations, which the human mind is created to sense and feel. They exist outside of spirits and angels, in the Divine of the Lord. They are substantial and real, indeed far more real than are the things of earth.

This concept of the atmospheres as containing finite creative forces appears at first glance to controvert the teaching that the Divine operates the same everywhere, and that all variety arises from the various reception of its activity by different organic vessels. This is illustrated in the Writings by the fact that the heat and light of the sun flow in the same everywhere, but are differently received by each different plant or animal. This would seem to imply that the bullae, or least units of the atmospheres, would all be identical in form, in structure, and in activity. Such an idea, however, is not borne out by the teaching of the *Principia* to the effect that variety increases as we descend the ladder of discrete degrees from the Infinite.

*That the figures of these finites are most perfectly similar one to another.* One, and indeed the principal degree and mode of perfection consists in similitude. Since points or simples are most perfect, in that they are also most exactly similar, because they are produced from the Infinite, from whom nothing but what is most perfectly similar can proceed; and since these finites afterwards proceed mediately from these exactly similar points or simples: it may be said, that of all the figures of finites these are the figures that are the most perfectly similar one to another; and although it cannot be denied that some dissimilitude may exist between these finites and between their figures, still the dissimilitude will be the least that exists in the series formed of successive finites. The dissimilitude itself arises from a series in the modifications, or in the frequent variations of the limits. The more frequently limits are varied, the greater number of causalities and causes there may be to produce dissimilitude; whence in things most compounded, there may exist, as it were, an infinite dissimilitude; so that at length all the compounds in a series of the same degree or genus may be dissimilar. The nearer, however they are to their origin and first limit, that is, the nearer they are to the first similar entity, the first simple, the first and only mode,

the less variation can they undergo; because the fewer are the causes of variation and the fewer the contingents and modes. (*Principia*, Part I, Chapter 3, Page 76)

Concerning the formation of vegetable seeds we read in the *Worship and Love of God*:

The first generating or plastic force, innate in the very seeds of vegetable foetuses, may be likened to a soul, for from this, and in resemblance to it are formed their bodies with their members and muscles, while the stems are continued with their branches, leaves and little tubes, and several other particulars which resemble animal foetuses. . . . But such genitures are the first and ultimate forces and powers of nature herself, excited from the conjunction of her most active forms, constituting ether, with the earth's forces of inertia, through the mediations of the rays of the sun; from which origin, in their first and ultimate principles, consequently in mediate ones also, they derive an image of primitive and most perfect nature, and, in a certain type, relate to superior or living essences themselves. But what the quality of this seminal force is, cannot be known but by unfolding the forms of prior nature, both those which have reference to active and those which have reference to passive powers, also in what manner the solar rays operate to join them together, to evolve which, from lasts to first would be too vast an undertaking. (*Worship and Love of God* No. 20, footnote m)

Further, direct teaching from the Writings:

I have spoken with angels concerning representatives, to the effect that there is nothing in the vegetable kingdom on the earth that does not in some way represent the Lord's kingdom. They said that all the beautiful and graceful things in the vegetable kingdom derive their origin from the Lord through heaven; and that when the celestial and spiritual things of the Lord inflow into nature, such things have actual existence; and that this is the source of the vegetative soul or life. And as this is not known in the world, it was called a heavenly secret. (AC 1632)

The budding and fruiting of a tree represent the re-birth of man—its becoming green from the leaves represents the first state; the blossoming the second, which is the next before regeneration; and the fruiting the third, which is the very state of the regenerate. . . . That such things exist in the vegetable kingdom is owing to the influx of the spiritual world. . . . Such endeavors could never have existed in everything of the vegetable kingdom unless the Divine continually flowed in; for from influx comes endeavor, from endeavor energy, and from energy effect. They who attribute all things to nature say that such things are imparted to fruits and seeds at their first creation, and that from the energy thence received they are afterwards impelled of themselves to such activities; but they do not consider that the effect is the continuation of the cause, and that when the cause ceases, the effect also ceases, and consequently that without a continual influx of the cause, every effect instantly perishes; nor do they consider that what is

unconnected with a first of all things, consequently with the Divine, is instantly annihilated, because the prior must be continually in the posterior in order that the posterior may exist. (AC 5116)

Something shall now be said about the vegetable kingdom, and its soul, which is called the plant soul. By the plant soul is meant the tendency (*conatus*) and effort to produce a plant from its seed progressively even to new seeds, and thereby to multiply it to infinity, and to propagate it to eternity; for there is as it were in every plant an idea of what is infinite and eternal; for a single seed can be so multiplied during a certain number of years as to fill the whole earth, and can also be propagated from seed to seed without end. This, with the wonderful process of growth from root into a sprout, then into a stalk, also into branches, leaves, flowers, fruits, even to new seeds, is not a natural but a spiritual power. (AE 1203)

The forms of the animal kingdom, which are called in a single word animals, are all in accord with the flow of spiritual substances and forces. . . . This animal form derives its *conatus* to such things from the First from whom all things are, who is God, because He is Man. This *conatus* and consequent determination of all spiritual forces can be given and exist from no other source, for it is given in things greatest and in things least, in first things and last things, in the spiritual world and therefrom in the natural world; but with a difference of perfection according to degrees. But the other form, which is the natural form, and which is the form of all plants, has its origin in the *conatus* and consequent flow of natural forces, which are atmospheres and are called ethers; and in these this *conatus* is present from that determination of spiritual forces into natural forces, which are ethers, and through these into the materials of the earth, of which plants are composed. (AE 1208)

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## DUALISM AND REVELATION

ALISON GLENN \*

In *Religion Without Revelation* Julian Huxley asserts that religion without revelation not only can but does exist. Certain social organs, he claims, which cope with the problem of man's destiny and which orient man's ideas and emotions and construct attitudes of mind and patterns of belief and behavior in relation to his destiny, can be and properly are included under the title,

\* This paper was originally prepared by Miss Glenn, a former student at the Academy of the New Church, for a course in philosophy at Dickinson College.