

The New Philosophy.

A Journal devoted to the exposition of the philosophy presented in the scientific, philosophical and theological works of Emanuel Swedenborg.

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PHYSIOLOGICAL LIGHT.

BY JOHN WHITEHEAD READ BEFORE THE CENTRAL OHIO SCIENTIFIC SOCIETY.

- I. *Facts.*
- II. *Causes.*

I. In the report of the Smithsonian Institution for 1895 there is a very interesting and instructive paper, entitled "Physiological Light," by Raphael Dubois, Professor of General and Comparative Physiology in the faculty of Sciences, at Lyons. The paper is divided into two parts, the first part treating of "Photogenic Organisms," which treats of the various animal and vegetable organisms that have the power of producing light. Part second treats of the "Special Mechanism of the Photogenic Function."

The power of these organisms to produce light is one of the most remarkable things that are found in nature. We never cease to wonder at this phenomenon; and yet, if we consider the subject carefully, we see no reason why this particular phenomenon should produce more surprise than the fact that heat is produced by animal organisms. Heat is a vibratory motion of the ether, so likewise is light. Heat, however, seems to be produced in a mode similar to that in which it is artificially produced, and, therefore, we have ceased to wonder at this vital phenomena; yet, there are many things connected with it which are quite as mysterious as the phenomenon of light production by animal and vegetable organisms, as, for instance, the uniform temperature preserved in the animal form by means of the blood.

Professor Dubois has forcibly presented to us the fact that photogenic organisms are not few in nature. He says: "The existence of the photogenic function has been demonstrated *de visu* in numerous species belonging to the two kingdoms, and it might, perhaps, be found in all living creatures, if we possessed instruments of sufficient delicacy to detect it." The photogenic function in the vegetable kingdom is less common than in the animal kingdom. "It is observed with certainty only in organisms destitute of chlorophyll, or, occasionally, in parts deprived of the chlorophyll-making function (the yellow flowers of the French and African marigolds, of the nasturtium, and others of the same color), and, therefore, corres-

ponding closely with animals, as to their general nutrition. But it is only in mushrooms and white algae that the photogenic function has been studied in a truly scientific manner."

The photogenic function is found in numerous species of the animal kingdom, of which many instances are given in the paper. Among these some of the most curious are some photobacteriaceæ, which, "when introduced either accidentally or experimentally, under the carapace of certain marine or terrestrial crustacea, they develop and invade the entire body. The animal thus invaded becomes luminous, but it shortly dies." The paper suggests that cases of phosphorescent saliva, sweat, and even wounds, observed principally in man, may be produced in the same manner. It is said cases also have occurred where the human cadaver has become luminous; also in butchers' stalls and slaughter houses, true luminous epidemics have occurred, affecting, sometimes pork, sometimes beef, sometimes horse meat. "In the general physiological laboratory at Lyons, a case of luminosity in the domestic rabbit has been recently studied, and from it was prepared, for the first time, a pure culture of a photobacterium of the flesh of mammals." This discovery has led to the elucidation of several important points in the biology of these curious parasites.

It is said that "The luminosity quite frequently seen in autumn in the forests, on dead leaves, or on fragments of young or old wood, and even in mines, on worm-eaten beams, is often, if not always, due to the vegetative organs of mushrooms of quite high organization. In certain mushrooms at an adult age the photogenic function is well marked." As to the mode in which this light is produced, he says: "It cannot be affirmed that, in the vegetables we have mentioned, the light is the result of a secretion. It seems rather to have its origin in the protoplasm, for, when a bouillon, made luminous by Photobacteria, is filtered through a porcelain tube, it loses its light; it would be otherwise if the photogenic substance were really dissolved in the ambient liquid."

The sea is the abode of many photogenic species.

Not only does the surface of the water sparkle from myriads of these creatures, but in the depths of the sea "numerous polyps, with horny or calcareous axes, form veritable luminous forests, producing a truly fairy-like effect."

Worms, polyps, echinoderms, crustaceans, myriapods, insects, and mollusca, all furnish examples of light-producing species, of which a number of particular species are mentioned in the paper.

The second part of this interesting account is devoted to a description of the Special Mechanism by which the light is produced, and to the mode of its production. Light of various colors is produced by different species. Some species produce different colors of light, giving variation of colors, according to the modifications of the light-giving parts.

Most remarkable and striking are the properties of the light of these organisms. The light of the Pyrophorous is said "to be superior to that of any artificial source of light." Again, "The quantity of heat generated by the photogenic organs is infinitesimal. A few heat rays have, however, been noticed. No electric phenomena accompany the light." Comparing the efficiency of artificial light with that of these sources of light, the author says:

"The experiments, taken together, fully justify the conclusions which we published in 1886, namely: that in contrast with artificial light, in which 98 per cent. of the energy is employed otherwise than in producing illuminating rays, physiological light employs effectively 98 per cent. of energy, with only 2 per cent. of loss. The quality of light, also, is superior to that obtained by artificial means."

Some years ago similar results were reached by Prof. S. P. Langley, aided by Prof. Very, at the Allegheny Observatory, showing the great economy of physiological light over that produced by artificial means, and its remarkable efficiency. Could we turn all the energy contained in coal into light in as economical a manner, the cost of lighting our houses and streets would be very trifling.

Prof. Dubois, in one experiment, shows that "The photogenic organ of *Lampyra*, dried and pulverized, still gives out light when the amorphous dust is moistened with a drop of water." From this he makes the conclusion that, "This simple experiment, which may be repeated with a multitude of other photogenic organisms, suffices to prove that it is neither in the structure, nor in the working of the organ or of the photogenic cell that we must seek for the ultimate cause of the emission of light."

From the investigations conducted by Prof. Dubois, it seems certain that the animal or vegetable organisms produce fine protoplasmic semi-fluid

granulations, which he calls "Vacuolides, from the appearance which they present under the microscope, and which are found in all photogenic elements, must be the plasmatic or microsomic corpuscles of the luminous cells. They are seen to undergo a series of metamorphoses, in proportion as their photogenic power becomes exhausted." From the observed changes it seems that, as these granulations or vacuolides disintegrate, they give out light, the substance that remains being in a crystalloid state. When the phenomena is completed the preparation is composed wholly of crystals. The light-producing substance is formed by a living organism. The granulation which produces the light may be separated from the living organism and preserved, under certain conditions, for some time, but, at a suitable temperature and in the presence of water, the granulation will disintegrate, give out light and perish, the substance of the cell becoming crystalline in its nature.

Another important conclusion, which is made in the paper, is that the energy which produces the cell and arranges its parts is *vital*, whilst the result in the production of light is physical, and in the production of a crystalline substance is chemical.

This paper furnishes many valuable facts and conclusions regarding this very interesting phenomenon, but there remains still a further problem as to the mode in which this vital energy is transformed into physical light. And again, we may ask what use is subserved to the animal itself by the production of this light? How is it that these low organisms can produce the most efficient and economical illuminant possible, and yet man, with all his skill and intelligence, cannot approach them in the efficient and economical production of light?

I desire here to direct the attention to one example of the production of physiological light, not generally considered as such. Swedenborg, in one of his works, affirms that, the glowing appearance of the eyes of cats in the dark is owing to their burning appetite for mice. (R. 566) the glow not being from the concentration of the rays of light, as is generally supposed, but is actually produced by the vital energy of the desire for prey. He also refers to a disease of the eye, called nyctalopia, which is seeing in the dark from fatuous light, (T. 349). From these instances and the numerous ones mentioned in Prof. Dubois' paper, it is evident that vital energy has the power of acting on organic matter in the body in such a manner as to set the ether into vibratory motion, producing light. We know, from the structure of the eye, that the nerve is spread out on the retina in such a manner and in so minute a form as to be adapted to perceive various forms of ether vibrations. Why

may not nature so adapt some organs as to also set up ether vibrations, using energy stored up in the vital organism, as the motive force or power by which to produce a light vibration of the ether, as well as a heat vibration of it?

II. *Causes.* What the nature of this ether vibration is, which constitutes light, is not yet very clear to scientists. Of sound vibration, Barker says. "All sound vibrations are the vibrations of elastic media." But of ether, he says:

"The vibrations constituting radiant energy are transverse vibrations of the ether; that is, they are vibrations perpendicular to the direction along which the energy is transmitted. It follows that the medium in which these waves are propagated must possess rigidity; that is, must in so far be solid." He quotes the following from Lodge: "The ether, as a whole, may be regarded as a perfectly continuous, subtle, incompressible substance, pervading all space and penetrating between the molecules of all ordinary matter, which are embedded in it and connected with one another by its means." From this it would seem that the ether is regarded as non-elastic, but the air as elastic.

Swedenborg, however, regards the ether as a highly elastic atmosphere, consisting of particles, in form similar to the air, but indefinitely smaller, which penetrate the interstices of all bodies. The vibration of this subtle medium produces the phenomena of heat, light, and electricity. Modern science has recently come to the same conclusion. Swedenborg describes the mode of this vibration. He shows the form of vibration which constitutes heat, that which constitutes light, and that which constitutes electricity. In his *Principia*, he says:

"The doctrine of the ether, or the phenomena caused by ether, may be reduced to the following compendious statement: Motion diffused from a given centre through a contiguous medium or volume of particles of ether, produces light; for, in consequence of this motion, the ether is reflected from every entity it meets, and thus an idea of the object is presented to the eye. *The central motion of the particles of the ether causes, not only a rigid expansion of every particle, but also heat; and if this motion be urged from the centre to the circumferences, it causes light, together with heat. If, however, it be urged from centres toward circumferences, so as to become a local motion, but without the circumvolution of every particle, it occasions light in a cold state.* There are corpuscles which resemble a species of effluvia, and which are so small as to be enabled to move only a volume of ether, but not a volume of air; and these, if spontaneously moved, excite light to a certain distance. If they are not spontaneously moved, but are put in mo-

tion by means of *the tremulation of the parts of any hard body in which they reside, in this case light is excited, and in like manner, electricity, so long as the tremulation continues.*" p. 296, vol. II. Again, he says: "In respect to phosphoric or meteoric light, as also with respect to electricity, we may observe that *both proceed from the same source, namely: from the ether, either put into a state of local motion, or else in an effort toward it. The ignis fatuus, as it is called, is only motion dispersed through the volume or contiguous area of the ether, without any rigid extension of its particles. . . . The ignis fatuus, therefore, is a local motion of the ether, produced by the motion of certain smaller corpuscles, so that the cause of warm and cold light is one and the same.* The corpuscles, or effluvia, we have mentioned, may be put into a gyration and motion, either spontaneously, that is to say, *ex se*, or from some internal cause; or else by the tremulation of some hard body, in which they are and from which they proceed. . . . The tremulation of this body causes, in like manner, a tremulation of the parts of the body, and of the minute corpuscles which inhere within it and are fluent without; in consequence of this tremulous motion of the body, the corpuscles in its interior compages being put into a tremulous motion, are impelled into gyres and eddies, as it were, and, together with these corpuscles, both the ether enclosed within the body and that which is fluent without; for, the ether thus put into motion, communicates this motion to the circumfluent ether . . . and hence arises light, and in like manner a certain degree of electricity; for there are no bodies existing which are not, in some way or other, penetrated by the ether, in regard, at least, to their texture and their larger and looser composition. . . . And, inasmuch as the ether may, at the same time, enter into the contexture of the parts, it follows that the ether, thus in motion and penetrating these parts, can bring them into the same gyratory motion with its own. This, however, would not be the case, if, instead of being in the ether, the motion were in the air, which does not easily enter the texture of the harder bodies. Phosphoric light, therefore, as well as electricity, depends upon the tremulation of the small and subtile parts of a body, from which proceed effluvia of the same nature, putting in motion only the ether; the longer, therefore, this body can thus tremulate, the more electrical it is, the more it abounds with subtile effluvia of a like nature, the more perfect are the electric phenomena." *Principia*, Vol. II, p. 297-9.

We have fully quoted these things, that we may apply the principles here set forth to the subject of physiological light. Let us recount briefly Swe-

denborg's conclusions. (1) *Light* is a motion imparted to the ether from the centre of a volume of ether to the circumference. *Heat* is a motion in which the particles of the ether expand and revolve, as it were, on their axes. *Cold light* is the light motion in which the particles of ether do not revolve. *Electricity* is a movement of the ether particles in a *gyre* or orbit. We may have any of these movements separate or combined with others. But when several movements take place at the same time, the energy is divided.

The problem in economical lighting is to obtain the light vibration without the heat and electrical disturbance, then all the energy will be expended in the required direction, and a very economical light will result. This result is obtained in physiological light. Prof. Dubois, as we have shown, proves that, "The quantity of heat generated by the photogenic organs is infinitesimal." "The most sensitive instruments fail to show any electrical phenomena." These living organisms utilize 98 per cent. of the energy in light production, whereas in artificial light only 2 per cent. is utilized; besides this the quality of the light vibration is the very best possible for the eye. These organisms have the power of producing a vibration of the ether which produces the motion of the ether from centre to circumference, without producing a revolution, or expansion, or a gyre of the ether particle. Fame and fortune await the man who can accomplish the same result as simply and economically.

The researches of modern scientists point to the vacuum tube as a means of solving this problem. When the air is removed the electric current, on passing through the tube, sets the ether in vibration, producing light, the presence of the air seems to retard the production of the light vibration, its absence leaves the ether in a freer state, in which it is more easily moved by the action of the electric current. Tesla believes the method of lighting by means of vacuum tubes will soon be made commercially successful. Swedenborg, in the quotation given above, shows that ether penetrates into all parts of solid bodies, but air is excluded. The ether is then in a freer state, so that all bodies in nature provide vacua, in which the freer action of the ether may take place.

Swedenborg, in his physiological writings, also frequently directs attention to the principle that ether, as a more subtile atmosphere, penetrates to all parts of the human body, and performs most important functions and uses there. The body itself, therefore, provides for the freer play of the ether particles than do its external surroundings; thence, in the body itself a more perfect vibration of the ether is possible, from which it may appear

that heat, electric and light vibrations may here find most perfect conditions in which they may manifest themselves. The body itself excludes the air, but admits the ether freely, and thus more perfect conditions for vibratory motions exist within than without it.

Let us apply this principle to the photogenic function in the animal kingdom. These animal forms possess an organ which has the power of setting in motion ether vibrations, which are almost entirely free from heat and electrical vibrations. The ether within the organ is in a freer state than outside, and the organ itself, in its very form and contents, is so constituted that it produces this vibration. Is this a merely mechanical operation, like the burning of a candle, or is it a vital operation, requiring volition or the action of the nerve centres? In many species it is certain that the production of the light is both produced and controlled by the nerve centres, so that by some means the motor nerves can impress their motion upon the ether, thus producing light waves. Nor is this in reality any more wonderful than the fact that the eye is an organism adapted for receiving the impression of these same light vibrations, the nerves then carrying them to the brain.

In some cases it is not very evident what use this light performs to the animal. Some observers state that, in some species, it serves neither of use for seizing their prey nor for protection. In other cases it is known to be of use to the creatures which produce it. In the glow worm and fire fly it is of use in sexual selection. In other species it serves as an aid to the sight. "Some crustaceans possess globular phosphorescent organs which constitute a highly complicated luminous apparatus, the lenticular body of the organs acting as a condenser, which enables the animal to produce, at will, a very bright flash of light in a given direction."—Sars. Many deep sea fish possess round, shining bodies, imbedded in the skin, which serve the same purpose. Many species of these light-producing creatures control the light at will, which shows a useful purpose to the animal itself. We must also conclude that, in all cases, there is a design or purpose, even where it is not yet known, because, in the created universe, the Creator made all things in use, for use, and by use.

"M. Dumas, in his work on 'Chemical Philosophy,' distinctly ascribes to Swedenborg the origin of the modern science of crystallography. He says: 'It is, then, to him we are indebted, for the first idea of making cubes, tetraedea, pyramids, and the different crystalline forms, by grouping the spheres, and it is an idea which has since been renewed by several distinguished men, Wollaston in particular.'"—N. J. Mag., Nov., 1839.

THE PROBLEM OF CREATION.

THE most remarkable characteristic of the system of thought given us through Swedenborg is what I may call its stupendous simplicity. The greater principles of nature do not appear in recalcitrant and unfamiliar forms. We seem to have known them long before, and, indeed, to have absorbed them with our first vital breath. In the least we have a type of the greatest, and all the secrets of creation lie locked in a grain of sand upon the ocean shore. The macrocosm or greater universe is thus imaged in each microcosm, each least portion. But of only one species of microcosm, man, is this comparison in any way perfect, for in man is represented everything which exists throughout the created universe. If this be indeed true we can in no way better understand the creation of a universe or macrocosm than by studying that of the microcosm, man. Each step in the evolution of a human organism must be scientifically the same as a corresponding step in the evolution of that world of which this individual is but a part.

To the future Swedenborgian anatomists, physiologists, and theologians must be left that delightful work of correlating these two creations and of unlocking that of the larger by means of the small and special creations which ever recur around us. My purpose at present is only to draw attention to one or two of the more salient features in both, showing how, consciously or unconsciously, this idea was embodied in Swedenborg's entire series of writings.

Man has a dual nature, and a dual origin. I am not here speaking of the birth from above and from beneath, which are births upon different planes, but of births from two parents upon the same plane. The dual nature, of which I speak, is the birth into will and into understanding, into a cerebellal and a cerebral kingdom. If this great principle be true in the creation of microcosms, it must, according to Swedenborg, hold good in the creation of macrocosms. This is exactly what Swedenborg's *Principia* teaches, and, with this in view, I must express my amazement that old New Church students can read that work and yet be "utterly unable to understand it." The dual origin of our universe was "from the Divine Love through the Divine Wisdom." These words are from the True Christian Religion. The *Principia* simply states "from God," who is, of course, Divine Love and Divine Wisdom, but in the succeeding stages the latter work carries down that principle of dualism with a scientific thoroughness not employed, because not needed, in the former. On the one side of this ladder of creation are "actives," on the other "passives," two varieties of offspring

which, in strict agreement with the births of sons and daughters to a married pair, take their natures from one or the other parent, or, in this case, from the Divine Love and the Divine Wisdom. And, like the children of this world, those "actives" and "fuites," or "passives," repeat the process implanted upon them by their Divine Parent, carrying the family of substance onward one generation after another. Six of these generations or "degrees," as Swedenborg calls them, were produced, ending on the "active" side in terrestrial fire, on the "passive" side in water. From these were built the seventh and closing degree, the angular or mineral. And God "rested on the seventh day." Yet even here that unity of two to form new creations takes place, and in the subsequent vegetable and animal kingdoms the same process recurs to infinity. Thus the *Principia* explains the creation of a macrocosm in terms of the microcosm, and reveals the duality of nature.

Of course Swedenborg does not teach a duality of gods. On the contrary, Divine Love and Divine Wisdom are a perfect one, just as in true marriage, the partners form a perfect one; for in them their souls are one, not poetically or symbolically, but absolutely. So it is with the Creator. This unity in duality is, however, best understood by studying the cerebrum and cerebellum of an individual man or woman. There the instinctive life and the reasoning life inspired thence are perfectly distinct and perfectly united. We might say that sons and daughters are human offspring; will and understanding the cerebral and cerebellal life — Divine offspring.

Next to the duality comes the trinity. In God this third, called Divine Power or the Holy Spirit, results from that perfect union of Love and Wisdom just described; nor is it any more separable from them than are they from each other. This we know from Swedenborg's theological writings, and we also learn there (D. L. & W.) that the atmospheres correspond to this Third. But the teaching was not new with him. Just as the dual system of creation is carried out, scientifically and rationally, in his *Principia*, so is its trinitarianism. The atmospheres, he there teaches, are found by a union of actives and passives, and in that combination the actives, following their true correspondence to the Divine Love, occupy the interior of each atmospheric particle, while the passives, with equal conformity, constitute its surface or form. This explanation of atmospheric particles is the same in Swedenborg's *Principia*, in his *Chemistry*, in his *Miscellaneous Observations*. Thus constituted the atmospheres are discreted into the same

number of degrees as are the actives and passives which form them.

In the microcosm, atmospheres are not so readily recognized, yet they undoubtedly exist. From the surface of our bodies a vapor atmosphere constantly rises, which we call perspiration. This is like Swedenborg's aqueous atmosphere, or vapor of the greater world. Next, we each have an air of our own, appropriated especially through the lungs. We know, however, from the keen scent of animals, that our personal air extends much further, and, indeed, is the general air made over into a personal one. That a definitely organized ethereal sphere also exists about us we cannot doubt, though beyond the electrical phenomena exhibited it, such as the crackling when brushing the hair, little is known about it. But, beyond all, can we doubt the existence of still more subtle spheres? We speak of these when we call one "magnetic," or say that his "sphere" is agreeable or disagreeable, or when we talk of the "atmosphere" about him. Do not be deceived into thinking that such language is only metaphorical. As in many other cases, this metaphor simply states a scientific fact, which we cannot prove definitely by our senses, not because such atmospheres do not exist, but because our external senses are built from materials on planes too low or too gross to receive them—just as the ear takes up impressions from the air, and not from the ether. The recognition of microcosmic atmospheres should, I think, open the way to a scientific explanation of hypnotism and kindred phenomena.

These atmospheres also furnish the readiest introduction to a study of degrees or planes. From subtle to gross these are the celestial aura, the spiritual aura, and the spiritual natural aura in the world of spirit, the magnetic aura, the ether, air and aqueous vapor in the world of nature. Aqueous vapor is a sort of pseudo atmosphere, not altogether a true one. The degrees of actives and passives are, however, much more difficult to understand. Passives, Swedenborg shows, are formed by compression of particles from the several atmospheres, water being the lowest. In microcosms the essential character of water is indicated by the scientific definition of man as "a water engine run by solar energy." That is true, but it is only part of the truth. In the nerves, as receptacles delicate enough to contain them, Swedenborg shows the existence of subtler or "spirituous"

fluids rising in successive degrees above comparatively gross water. These constitute and form the organic substance of the planes of sense, memory, natural reason, rationality, spirituality, and the higher spiritual or "celestial." So, here again we have abstract terms which prove to be the names of real substances. How these same planes exist in the macrocosm cannot be explained here, but there is nothing in the three kingdoms of nature that is without them.

Actives are discreted in the same way as passives, but their varieties are more difficult to explain, because the world proper to actives is so very different from our own. Whereas, planets are the realms proper to passives, suns are the homes of actives. Actives, then, manifest themselves as fire and heat, and, since they resemble their active parent, the Divine Love, for this reason, and no other, Swedenborg, in his later writings, speaks of fire as "corresponding to" Divine Love. In accordance with this character, motion is especially predicable of actives.

Trinities of actives and passives, uniting into force or power, are found everywhere throughout nature. Just as man and woman unite into a third, which has the power to produce new generations of beings, so do corresponding substances act throughout nature, in her mineral, vegetable, animal, and atmospheric kingdoms. To make this more forcible, I will append a few of these trinities, with the great originating Trinity above them:

DIVINE LOVE.	DIVINE POWER.	DIVINE WISDOM.
Active	Atmosphere or Element	Passive
Sun	Solar system	Planetary bodies
Fire	Steam	Water
Centrifugal	Equilibrium	Centripetal
Man (vir)	Man (homo)	Woman
Will	Operation	Understanding
Cerebellum	Brain	Cerebrum
Motary nerves	Nervous system	Sensory nerves
Arteries	Circulatory system	Veins
Red corpuscles	Blood	White corpuscles
Alkali	Salt	Acid

The deeper we study, the more we see this, duality and trinity in unity, effigied throughout the entire universe, repeated again and again in every conceivable way, and in every conceivable form. If we then wish to know of creation, let us not resort to a blind reason, but study every image of that creation about us; watching it repeated and again repeated, yearly, in every species of the vegetable kingdom, and in varying cycles among animals and men.

JOHN SWANTON.

NOTES.

The *New Church Messenger*, of March 9th, refers to the successful surgical operation of removing

the stomach, recently performed in Switzerland, by Dr. Carl Schlatter, of the University of Zurich.

The article then quotes the conclusions of Dr. Wendt, in the *Medical Record*, of New York, as follows:

- (1) The human stomach is not a vital organ.
- (2) The digestive capacity of the human stomach has been considerably overrated.
- (3) The fluids and solids constituting an ordinary mixed diet are capable of complete digestion and assimilation without the aid of a human stomach.
- (4) A gain in the weight of the body may take place in spite of the total absence of gastric activity.
- (5) Typical vomiting may occur without a stomach.
- (6) The general health of a person need not immediately deteriorate on account of the removal of the stomach.
- (7) The most important office of the human stomach is to act as a reservoir for the reception, preliminary preparation and propulsion of foods and fluids. It also fulfils a useful purpose in regulating the temperature of swallowed solids and liquids.
- (8) The chemical functions of the human stomach may be completely and satisfactorily performed by the other divisions of the alimentary canal.

In addition to this, the article adds:

"In harmony with this last conclusion, a lecturer on the diseases of children, in a certain medical college, once informed the writer that an infant has no stomach—that the alimentary canal in a young babe is continuous, and that the stomach is an after formation."

Basing his reasoning on the above statements, the conclusion is made in the form of a query, "whether the stomach is one of the evil uses which have resulted on account of the sin of man; and whether man would have a stomach if he had not fallen into the practice of evil. (See D. L. W., 538-345.)

On referring to the evil uses spoken of in D. L. W., they are, poisonous and injurious animals and plants, also foul and filthy matters in the mineral kingdom. Such things can have no possible reference to the stomach, the uses of which are for the sake of the nourishment of the body.

The medical lecturer above referred to must have spoken in a very loose way to have been so understood, for the stomach is fully formed at birth. It appears very early in fetal life. When it is first formed the alimentary canal is indeed a straight tube, that is, not sinuous, but it is distinguished into three parts, and the stomach is a distinct en-

largement, as may appear from its description and the cuts in Gray's Anatomy.

We will here quote a few of the many things said by Swedenborg, of the functions of the stomach, in "The Animal Kingdom," to show the marvelous perfection and excellent uses of this organ:

"Nature, or the soul in which this nature dwells, here disengages, develops, and realizes all the latent resources of art and science, chemical, physical, and mechanical, from their innermost grounds and principles; which, if a man can touch on the surface only, and with the edges of his lips, he is an Apollo." 95.

"Here nature, in her operations, proceeds by degrees from outmost to inmost; and also from both at once; for nothing is presented, that she does not subdue, dissolve, remodel, convey outwards, and at last into the blood, for which it is adapted." 96.

"The stomach—convoluted of a manifold series of membranes; these, of a manifold series of muscles, tendons, ligaments, glands, and papillae; and these, of a similar series of fibres, vessels and ducts—winds in a stupendous gyre, and thus generates a cavity or ampulla, which, in its folded and corrugated state, is designed to be the very perfection of geometrical, terrestrial and coporeal forms; and to emulate and aspire to a kind of infinity, and to powers of spontaneous activity and motion. This form must be called the perpetual-circular, or, properly, the spiral form. It is the essential form of motion, or of the fluxion of organic substances in the organic world." 97.

From these and other things to be found in "The Animal Kingdom," it is evident that the stomach is one of the noble organs of the body. That its functions can be taken up by other organs and be somewhat imperfectly performed, is because it is one of the series of the digestive and absorptive organs. The function of the stomach is also vital, if we consider the whole series of alimentary organs. The reason why it may be excised and the patient may still live, is because, in the wonderful economy of nature, other parts of a general series will take up the use of a part that is either deranged or removed. Such a substitutional function should never be used to argue that any organ of the body is not a vital part of the system, or is useless, or evil. The whole alimentary canal is one series. When the food is first taken into the mouth, the finest and purest essences are absorbed at once into the system through the tongue. In the stomach the next purest substances are absorbed, and only those portions pass on which require a further process of digestion to prepare them for absorption into the body.

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ENCOURAGING WORDS AND DEEDS.

THE NEW PHILOSOPHY has already received a hearty welcome. A number of societies have already secured clubs of ten or more at the special rate, and others are moving in the same direction. Our brethren in England also appreciate its use, and are securing for it a circulation. Specimen copies have been sent out to a large number of public libraries, men of science, and educators. Several libraries have requested it to be sent regularly, among them The Library of the Smithsonian Institution, and The Library of Congress. Contributions have been received sufficient to send it to a large number of public and college libraries regularly. A number of correspondents have sent us names of persons to whom it will be useful to send it. Will others cooperate with us in sending it out freely?

“I have been very glad to see your published thoughts in the line of the development of New Church science. I believe that there is a distinct impetus in that direction awakening in the Church; and I agree with Mr. Swanton, that the work is indispensable in the establishment of the Church. Otherwise, why is it so often said, in the Writings, that the human mind is such that it cannot be satisfied unless it see a thing scientifically and rationally confirmed? There is a state which is compatible with a genuine affirmativeness, which *must be fed scientifically*. The Church has a plain duty in this matter; and I infer, from the name of your paper, that you have started the enterprise in recognition of the fact.”

“Our friends here are delighted with your new undertaking, and with the new spirit which is creating a revival of interest in the grand principles of the only genuine philosophy of science that is extant.”

“I believe it to be one of the most useful efforts that the Church has ever made.”

THE USE OF KNOWLEDGE OF CREATION.

From Swedenborg's Work, Angelic Wisdom, concerning the Divine Love and Wisdom.

“Part First of this work treats of God; that He is Divine Love and Divine Wisdom; that He is Life, and that He is Substance and Form; which is the very and only Esse. Part Second treats of the Spiritual sun and its world, and of the natural sun and its world, and of the creation of the universe with all things thereof from God by means of these two suns. Part Third treats of degrees, in which are each and all things that have been created. Part Fourth now treats of the creation of the universe from God. All these subjects are now explained, because the angels lament before the Lord, that when they look upon the world they see nothing but darkness, and among men no knowledge of God, nor of heaven, nor of the creation of nature, for their wisdom to rest upon.”
D. L. W. 284.

Annals of the New Church, compiled by C. H. Odhner, Published bi-monthly by the Academy of the New Church, Philadelphia, Pa. This publication is designed to give a chronological account of all things connected with the history of the New Church. Two numbers have already been issued, which show a careful collation of the events of Swedenborg's life to the year 1750. The work is adorned with cuts, the full page illustration of Swedenborg's house and garden being especially interesting. This work will not only be needed by the future historian of the New Church, but will also be of great value to all who desire to be well informed in the events connected with the development of the New Church. Prof. Odhner is a careful investigator who has been gathering these materials for many years. We are glad to see that he is placing them within the reach of all.

“Swedenborg's Service to Philosophy,” by Rev. S. C. Eby, St. Louis, Mo., is a pamphlet of 48 pages. It treats briefly of Swedenborg's principles as applied to the subjects of Ontology, Noetics, Metaphysics, Aesthetics and Ethics. This pamphlet is designed merely to call attention to the general position which Swedenborg's philosophy takes on these subjects. The author shows that they are intimately related to each other, and, whilst avoiding the extremes of pantheism, idealism, and materialism, Swedenborg clearly presents the idea that God is the One Self-Existing and Sole Subsisting Being who is the All in All of the Universe, and yet He is a Being differentiated from that Universe by discrete degrees; but Who, by influx, flows into, governs and sustains it. All planes of existence, material, moral and mental, have an intimate connection and relationship with Him. Thence, God and the Universe, whilst distinctly different, are inseparably connected and inter-related, as the soul and body in man.