The Etheric Formative Forces In Cosmos, Earth and Man by Dr. Guenther Wachsmuth (Part 7)

(continued from Part 6)

We have already shown (Chap. Ill, pp. 97-102) that, if one wishes to understand the structure of the body of Saturn as this has been established by modem astronomy, one must take as a foundation the fact that the etheric structure of the more highly evolved Earth represents a complete reversal of the etheric structure of Saturn : that, therefore, what is inner in the body of Saturn has become the outer in the body, of the Earth, and the outer in the body of Saturn has become the inner in the Earth. Moreover, we have set forth that this reversing process repeats itself in the organism of the Earth itself, in that the etheric, structure of the interior of the Earth represents a reversal of the etheric structure of the exterior (Chap. III). We perceive, then, that this mighty macrocosmic process of differentiation, which changes the outer to the inner through the reversal of the etheric structure, and thereby alters and furthers the evolutionary conditions of each tremendous planetary organism, also reappears in the evolutionary process of the embryo as the most important factor in its evolution. What has brought to pass the genesis of the macroorganism, this brings about also the genesis of the embryo. The coming into being of the organisms proceeds both macrocosmically and micro-cosmically according to the same harmonious laws ; both there and here it is the work of the etheric formative forces.

If we consider this process in the case of the evolving organism of animal and of man in individual instances, we

shall discover that the unfoldings and infoldings which bring into existence the first organs come about through actions of thrust and pull, and that we can therefore follow here concretely, in detail, the alternate activities of the expansive force-group (warmth ether, light ether) or the contracting, severing force-group (chemical ether, life ether) (Chap. II) in the evolutionary process.

Of maximum evidential value for the representation here given are those experiments which have been carried out in the direction of obstructing or modifying artificially these formative processes or primal organs.* Hertwig thus describes them (p. 341) : " The interference consists in the addition of limited quantities of lithium salts to sea water (to 1940 ccm. of sea water 60 ccm. of a 3*7 per cent, solution of lithium in ordinary water). As a result of this, that region of the germinal vesicle which ordinarily becomes the digestive tract, instead of now being infolded into the blastular cavity, is thrust forward to become in the opposite direction an outwardly extending process. If the lithium larvae—as Herbst has called them because of the cause of their origin— are at a suitable time placed again in pure sea water, the intestine remains folded outward." Further on (p. 343) he says, in speaking of the so-called inhibition malformations (or deformities), " among which are to be classed the greater part of the malformations in vertebrates " : " As is so appropriately expressed in the name, their peculiarity consists in the fact that, because of a checking from without, either this or that evolutionary process has not been permitted to reach its normal outcome, and by reason of its being checked a more or less notable deviation from the normal has been produced." Such inhibition malformations have been artificially produced when eggs, " instead of being placed during the first stages of segmentation in ordinary water have been put in water in which 0*6—0*7% of table salt has been dissolved. It is startling to observe what a great disturbance arises from a solution of table salt— which one is accustomed

to call a physiological one because of its harmlessness—when it is introduced at the right moment in the evolutionary process. In this instance it is especially the parts of the outer germ-layer serving as the basis for the nerve substances that are acutely

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injured by the chemical interference." The effect was, namely, that the first stages of the third to the fifth cerebral vesicles did not draw . together into a tube, but formed outwards into an open plate. We have, therefore, to do in each of the cases cited with the fact that processes

* In connection with all these problems, see the fundamental work of Dr. Hermann Poppelbaum : " Der Bildekrafteleib der Lebewesen." Stuttgart, 1924.

which in themselves, according to the inner laws of the evolving organism, ought to have led to a contraction and infolding were transformed into a forth-thrusting and outward opening instead, and this by reason of an artificial environment containing salt ! But this is thoroughly characteristic. If one recalls that the salt-forming process is induced by the action of the suctional, attracting force-group, it is clear that an organism surrounded artificially by a salt-forming process responds outwards to the drawing action of these forces, and, instead of folding a certain organ in normal manner inwards, it now turns it outwards.

These transformative processes take place, not only ontogenetically, But also phylogenetically. A typical example in this matter is the arising of breathing organs for air (lungs) out of those for water (gills), which comes about through the fact that a process hitherto occurring outwards in the organism (breathing in the outer layer of the body) is removed to the interior of the organism and the corresponding organs are developed by means of dynamic infoldings and

unfoldings. Hertwig thus describes this process in the case of the lungs of vertebrates (p. 403) : these have ” come into being out of an organ that is already present in fish (which breathe, of course, only by means of gills) and which originally has nothing to do with breathing. It is the swimming bladder which develops as a fold of the anterior section of the intestinal tube. Filled with air, which is seldom changed and contains much carbonic acid, it serves originally as an aerostatic apparatus—that is, a contrivance by means of which the bodily displacement of water may be varied. In swimming in greater depths and in rising to the upper strata of the water, it is an aid by reason of the fact that its volume can be increased or diminished by contraction or expansion of the muscular walls.

Afterwards the swimming bladder is changed into lungs by means of a metamorphosis of function, which is carried out in the case of the dipnoi and the amphibians, and can in part be directly observed. . . . Through the transference of breathing into the interior of the body, the same purpose is served by other means in an even more perfect degree than through gill breathing. In one case the means is an increase of the outer layer of the skin by means of fold-form at ions ; in the other the transformation of an originally sac-shaped cavity, developed from* the intestine into an extremely complicated system of cavities. For a suitable variation of the air in this, by means of inhaling and exhaling, various other organs co-operate—groups of muscles in the walls of the; chest, the diaphragm, etc.—so that the lungs in inhaling are expanded . and in exhaling contracted/’

How the rhythms of breathing are established, we shall set forth in Chap. XII. As is sufficiently manifest from the above examples,

both the original formation and also the transformation of the organs of living creatures are the result both phylogenetically and ontogenetically of such inversion

processes which, in accordance with evolutionary laws, induce the inner to become outer or the outer to become inner. The macrocosmic metamorphosis from the Saturn body to the Earth body and from the exterior of the Earth to the interior is the archetype for the microcosmic metamorphosis from a lower stage of the embryo to a higher stage. Both processes are, according to similar laws, the work of the etheric formative forces. This is a primal phenomenon in the genesis of the macrocosm and of the microcosm.

Yet here again one must not expect by any means to understand this process through any merely mechanistic interpretation, for in that case understanding will fail us in the explanation of the extraordinary differentiation between the different genera of animals and even of individual men. For, if we have understood which etheric formative force or group of forces gives the impetus to a specific evolutionary process in the organism, we have thereby recognized, to be sure, the general principle of this phenomenon ; but we need, at least in the case of man, for a full comprehension of the modifications of these general principles in individual instances, an understanding also of those influences which are exercised by the psychic element upon the action of the etheric : that is, to what extent impulses from the side of the soul in the case of individual men induce, further, check, or hinder the activity of the etheric formative forces.

The Sense Organs and their Formative Forces

As we have been able to understand the formation of the first organs of the organism through the activity of the etheric formative forces, so .also we may now come to an understanding of the nature of the “ stimulus/’ Hertwig says (p. 171) : ” Since protoplasm is a highly excitable substance, therefore excitations may in this way be conducted from cell to cell and effects may eventually be produced in other far removed places. Since such excitations generally do not come under our observation, they belong almost entirely to the class of

processes utterly unknown to us in the life of the cells/' Further, he states (p. 142) : " While sensitiveness to excitation is a general characteristic of the cell in itself, with the progressive evolution of the embryo, individual cells become especially sensitive either to light or to sound, or to mechanical disturbance or to chemical substances in a gaseous or fluid state. These become, therefore, the cells of our sense-organs of sight, hearing, taste, smell, or touch. Others characterize themselves through the capacity to change their form by contraction ; these become muscle cells. Still

others enter upon the service of nourishing the entire organism ; they secrete digestive juices of this or that kind ; i.e., specially suited for the digestion of carbo-hydrates or albumen fat. Other cells serve for the transportation of the nutritive juices ; still others are metamorphosed for protection, support, or procreation, etc/' And yet further (p. 413) : " Excitations which are taken up by the sense-cells from without and are conducted further call forth in the many-sided organism reactions in the organs affected, which lead either to a secretion or to a contraction and thus become the point of departure for a new division of labour. For this reason the cells affected undergo various differentiations.

To the question of the reality of this division of labour we shall return in discussing the siphonophoran. As we have already pointed out in Chap. V., it has been shown to be utterly impossible to understand the reality of the " stimulus " by means of the investigations which have been made in so-called " animal electricity." Research into vital phenomena and nerve-sense processes on the basis of animal electricity has done nothing toward a solution of the riddle. But the differentiation of the cells with relation to thermal, light, chemical, or other stimuli and according to their reactions through contraction or secretion, becomes intelligible to us at once if we recall (as we have already been able to perceive in the case of the plants) that they are controlled in varying

degrees by the different etheric formative forces. A cell (or cell complex) controlled by warmth ether will react to a light-ether influence (" stimulus ") from without differently from the way in which a cell controlled by light ether will react. In the sensitivity of a cell or cell complex in the presence of stimuli of sound, heat, light, taste, etc., there is revealed the etheric structure of these cells, their adaptation to warmth ether, light ether, chemical ether, etc. Thus, for example, only a cell complex which is controlled in its inner structure by light ether (for example, in the eye) will rightly take up a light-ether influence from without and respond to it. Goethe therefore uttered a profound truth intuitively when he said : " The eye owes its being to the light. Out of indeterminate and auxiliary animal organs light calls forth an organ like to itself ; and thus the eye is formed by the light for light in order that thereby inner light may respond to outer light."—'The different distribution of the several etheric formative forces in the ether body of an organism is the true cause of the different distribution of the corresponding sense organs. Here, indeed, we stand at the door to an understanding of how the several sense organs are formed through the varied responsive relationships between the parts of the inner organism controlled by specific etheric formative forces and the etheric influences from without. (See also Chap. XII.)

The capacity of individual organs for secretion and for contraction are likewise to be explained on the basis of the differentiation of the ether body of a specific organism. So, then, the contraction of an individual cell or a cell-complex or a whole organ always follows from the fact that one of the two phylogenetically younger etheric formative forces (chemical ether or life ether), which always act through contraction, now becomes active, either by way of an external impulse or an autonomous inner rhythm. On the contrary, a secretion—when it is not simply the resulting phenomenon from a process of contraction—■ is due to the fact that one of the

phylogenetically older etheric formative forces (warmth ether or light ether)—which always act centrifugally— has come into action.

If we know the characters of the individual formative forces, we can from many physical processes draw conclusions regarding the special structure of the corresponding ether body of an organism. Only we must not forget that in a living organism there are also processes which are purely etheric in nature. Here lie the boundaries of a physiology which reckons only with substances. In order to be able to understand many essential physiological processes, it is necessary to have a systematic understanding of the ether body of the organism.

Since we have set forth and illustrated through phenomena which of the etheric formative forces bring about the several states of aggregation of substance, we can now also follow their activities in the ontogenetic solidification of the various members during the several stages in the development of the embryo. We thus recognize that in the process of condensing and solidifying of cell-groups—as, for example, in the change from gelatinous to fibrous tissue, to cartilage, bones, teeth, or in the three developmental stages of the vertebral column and the bony parts of the head, the force-group at work is the condensing group. Indeed we can attribute to their true causes pathological exaggerations in such processes and intervene intelligently with curative means which introduce the activities of the opposed etheric forces.

If the etheric formative force which had worked upon a specific cell-complex changes, then the state of that cell also changes. Hertwig says (p. 156) : " In the case of fully differentiated cells a change of function is only very seldom observed ; yet the individual modifications of the groups of connective tissue may pass over into one another ; cartilaginous connective tissue and collagenous tissue may arise from gelatinous tissue through the intermediate stages of embryonic cartilage and embryonic connective tissue ; and

these may in turn be metamorphosed into bony substance. From tiny bodies of connective tissue fat cells may be produced. In the changing of functions on the part of cells and tissue,

the original products of the protoplasmic substance are generally first destroyed. There appears a loss of differentiation, as the expression goes in pathological anatomy. Thus the basic substance of bone is softened down before ossein appears in its place ; connective tissue fibre undergoes sclerosis. … At present, metamorphosis of function, together with its metamorphosis of cells and tissue is still a very little studied chapter of histology; yet it is evident, as it seems to me, that even in the case of fully differentiated cells there exist alongside of the capacities already developed also others latent, which, under the necessary conditions, may become active. ” We may now say that the becoming latent or active of functions, or capacity for reaction to “ stimuli,” on the part of cells or cell-complexes, is the result of the becoming latent or active of the etheric formative forces appropriate to these functions or reactions. The cause of change of functions, change of sensitivity to stimuli, change in state of aggregation in cells and tissues, of the appearance of new organs and capacities and the disappearance of others previously present—the cause of these things lies, not in the substance of the physical body, but in the metamorphosis of the ether body.

The individual stages in the metamorphosis of the cells, cell-complexes, organs, etc., are controlled by the organism as a whole—that is, in our sense, by the whole ether body of the organism. Hertwig expresses the concrete experience thus : “ Plainly the single cells here have no influence upon the ultimate result called forth by the stimulus ; for this depends solely upon the systematization of structure-parts already present and prepared for action, which systematization is based upon the evolution of the whole organism and is also

maintained in its condition capable of work by the whole.”

If, for instance, at a certain stage in the evolution of the embryo of a child in process of development, a hitherto “ latent ” formative force comes into activity, or a functional change takes place in one part of the organism, then the entire organism is drawn into sympathy with this, and similar changes take place in other parts of the organism. One need only recall here the parallelism between the change of voice and puberty in man. Hertwig expresses in a very vivid fashion these correspondences between the distributions of forces in the whole living organism (p. 134) : ” For, if the cells, which appear through division out of the fertilized egg, do not constitute together a mere aggregation, but—as is self-evident—exert activities one upon another, and constitute themselves as a cell state into a system, there lies in their potentialities alone a source for the constant and systematic growth of a complexity. We have here to do with the universally applicable law of Nature that, when new members are

introduced into a closed system of mutually inter-dependent parts, not only the system as a whole, but also the relations between all its parts, will be altered. If a new planet should enter into the system of the heavenly bodies, its influence would first of all make itself perceptible in the disturbance of the motions of the bodies nearest to it. These disturbances would then in turn bring about further changes in a constantly widening circle even till a newly established system of relationships should have been perfected.” With regard to similar occurrences in the living organism he naturally makes this acknowledgment : ” The objects of our research will be, of course, only such actions as either come directly within reach of our sense perceptions or else through accessory experimental means can be made perceptible to us. Now, we certainly see in the course of the evolutionary process in the development of the embryo as its parts become more and more

clearly differentiated, the visible results of innumerable troops of active builders. The study of these has been for more than a hundred years the sphere of research for embryology. And who would deny with what great results the science of biology has acquainted us in the form-building in plants and animals in the most varied stages of evolution, so that it has already developed a splendid system, as a simple comparison with the science of the seventeenth century will show. And yet, in spite of such progress, we cannot conceal from ourselves that what we have thus far investigated in the occurrences in the embryo is only a very incomplete fragment of work; since, although we have learned to understand very many ultimate results of the working of the cells, yet we have won no glimpse into the process of their work especially in the more delicate machinery of ontogenetic happenings." It is tragic to hear what one of the most distinguished investigators of our time expresses in these words. I believe that we can now state, however, on the basis of the understanding of the etheric, what here follows :—

The " active builders " in the life phenomena of the organisms are the etheric formative forces, whose specific distinctions and activities ■we are able to perceive in the realm of both the macro-organism and the individual, the macrocosm and the microcosm ; and the glimpse into the process of whose work and also into the embryonic occurrences we win through the concrete study of the ether body of the organism. We shall in this way pass on to an understanding of occurrences in heredity ; shall be able to investigate to what extent the organism of the new . creature coming into existence is determined by the organization of its ancestors and to what extent its evolution is independent of them—■ that is, depends upon the impulses of its own soul. The knowledge of the etheric formative forces, and of their differentiated working, gives to us on the one hand a glimpse into the basic general laws of the macro-cosmic world processes of the great planetary organisms, as also of the earth organism, and, on

the other side, the corresponding harmonious laws of the tiniest micro-organism as well as of the embryo. The etheric structure determines the coming into existence and the disappearance of the macrocosm and the microcosm according to similar or complementary harmonious laws of creation. The knowledge of these twTo apparently polarically opposite spheres will set the two side by side in their mutual relationship through an understanding of the ether body of the organism and bring before the eyes of man combinations of which he could never have experienced anything by means of the materialistic world conception of the last century.

Animal Instinct

In order really to clarify our picture of the inner working principles, the form-shaping forces, and primal forms in organic living beings, we will consider the genesis and the life of a unique living creature which appears in great numbers in the oceans of our earth organism and has caused to biological investigators innumerable perplexities: the siphonophoran. Unfortunately, in what here follows we must limit ourselves to the observation of the most important characteristics of this unique animal, in order, to begin with, that we may enter into the essential being of the form-shaping forces and the systematization of the organisms due to these.

The siphonophoran—or, as it is also called, the siphonophoral colony—is a living being appearing in the sea which has grown up out of many individual animals organically brought together, and, indeed, in such a way that neither could the whole siphonophoran maintain life without the individual animals constituting it, nor the individual animals without the whole siphonophoran. The integration of the animal is as follows.

The whole siphonophoran is principally built up out of the following:

1. An animal which does nothing else than to form the central trunk, upon which the other animals have placed themselves ; this trunk animal possesses a swimming bladder with which it keeps the whole colony swimming and balanced, and supports it; as we shall see, none of the other animals has this capacity.

2. One or more motion animals, or " medusae," which have been called jestingly in scientific writings the "locomotives " (Haeckel). These animals can do nothing else than to keep the whole colony moving from place to place by means of a special sort of backward thrust of the sea water, in which the colony swims, thanks to the central animal; this motion renders possible its nourishment. Yet these animals themselves have neither nutritional nor reproductive nor any other sort of organs ; they can do nothing else than produce movement in one direction or another.

3. Covering or protective animals, which have no other function than to protect the whole against attack, to defend it ; they themselves can neither eat, nor digest, nor cause motion in one direction or another ; they can merely " protect/'

4. Fighting and attacking animals, which possess " nettling threads," with nettle organs which contain poisonous points with which they can severely injure a hostile animal; but they are capable of no other activity.

5. Eating and digesting animals, very important colleagues of the other animals since they alone take in the nourishment for the whole animal state, work it up and digest it and conduct only the prepared nutritional substances into all the other animals, which can prepare no nourishment for themselves.

6. Creatures with organs of sensation. These alone possess organs of sensation which feel for the outer and inner condition of the whole animal-state and react accordingly.

7. Animals for reproduction~that is, sex animals. These form

the male (more oblong) and female (more round) sex organs (suggesting the unique phenomena of the sidereal pendulum). These alone can provide against the dying out of the genus siphonophoran and for its reproduction.

These seven kinds of animals now stand in a unique reciprocal relationship. Scientific research has established beyond refutation that we are not here dealing throughout with one animal with seven parts, but that all these animals are complete beings each existing for itself. The single animals, when separated, can still for a short time continue alive independently; yet only for a time, since the " attacking animal " cannot maintain itself in the right position without the "equipoise animal"; it always falls over ; it cannot nourish itself without the " eating animal " ; cannot reproduce its kind without the " reproductive animal " ; defend itself without the " protecting animal " ; move without the " moving animal " ; perceive the world without the " perception animal," nor orientate itself. These various animals are, therefore, compelled, if they would live, to form an animal unity! This necessity has been met.by these animals when they have fixed themselves together on the trunk animal and now live in common in the water as the siphonophoran.

If one investigates the realm of will in this animal, it appears that all the voluntary motions of the several animals are in complete agreement,

and yet that an individual will of each animal can be clearly demonstrated. (Haeckel.) To the injury of any animal all the others react, etc.

This unique phenomenon in the kingdom of Nature permits us to take a profound glimpse into the workshop of the living being. Haeckel, who in this field especially accomplished a great deal, was unfortunately prevented from a full understanding of the phenomenon which here lies before us because he had become so absorbed in the Darwinian theory of " adaptation " and "

heredity ” and “ natural selection ” that he lost a comprehensive vision for the contradictions in this theory at many points where it is false. In fact, the siphonophoran is a model example to cite against the mechanical theory which would trace everything back to “ adaptation ” and “ heredity.” het one think out to a conclusion what would have had to pass phylogenetically in the case of the siphonophoran if the primal siphonophoral animal under consideration had been obliged to wait until this animal—in the course of thousands of years—had obtained by means of adaptation and heredity the instincts of reproduction, nutrition, equipoise and motion. It would have disappeared long ago before the genesis of these instincts and their organ-forming activities ! This course of reflection, if pursued to a conclusion, will show clearly that the Darwinian theory cannot be maintained.

We must ask ourselves : In what relation do the functions and instincts of the individual animals, in the case of the siphonophoral animal, stand to the whole living creature ? What is primary ?

We have seen that each separate animal has its own will, and also that a collective will ensouls the whole and maintains it as a living being. How does this unity come into existence out of the multiplicity? Only through the fact that the will of each several animal has led them to one another for the reason that an incarnation as a living creature was impossible for each separate animal in that each separate animal being could not live alone—that is, could not maintain itself alone in a body in the water without a blending into a unity for the sake of an incarnate life, for the creation of the organism.

Whoever would maintain that the dead substance has endowed itself with life and woven all the functions of the animal by means of adaptation is talking nonsense in the very presence of the reality. The will impulses of the several animal beings unite to form out of substance this organism in which, during their common incarnation, they may live as a blended unity.

The living organism of the siphonophoral animal has, therefore, been shaped through the uniting of several instinct-beings into a group-will which then as a unity ensouls the living organic body.

World of Being

forms the

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World of Phenomena

(formed living organism)

The instinct-beings are therefore the primary, the active, the formshaping ; the living organism which unites them and, renders possible for them an incarnate life, is secondary, that which has been produced, the formed, the phenomenon.

Whoever will think in the opposite direction—as do certain Darwinians and all related to them in their mental tendency, for whom the spiritual is merely a result of the vibrations in the brain—let him only once cause a piece of sandstone, for example—-that is, dead substance— to become by means of adaptation and heredity a " sand-animal " feeding itself and reproducing its kind.

Against the fundamental fallacy of the Darwinians, Hertwig says in convincing fashion (p. 640) : " There are organizational relationships

iii living beings based upon such general laws that their genesis cannot be logically explained on the basis of natural selection out of minute relationships in organization. To this class belong—to begin with this at once—the fundamental peculiarities of living substance, its capacity to feed itself, reproduce itself, grow, to perform work, and to experience the most varied stimuli. Let us take only the multiplication through division of the cell grown beyond the

individual mass. Since the capacity to maintain itself through feeding, growth and division is an indispensable pre-requisite to the maintenance of life upon our earth, therefore, along with the creation of living substance there must also be given this capacity ; for otherwise even the simplest living being would have no capacity for continuance. A gradual acquisition through cumulative selection is precluded since here the logical state of affairs requires an either orWe might also say : The spiritual impulse or instinct must already have existed before the formation of the organism ; for through the spiritual impulse, through its tendencies and general principles, the formative forces first receive the impulsion toward their work and its direction in the shaping of substance into a living organism.

New instincts will then impose upon the formative forces constantly new ways of working and lead genetically to the creation of ever new organs. Behind all the capacities of living substance, division and severance, expanding growth, etc., which are rendered possible through the ether body, there stands as the impelling spiritual reality the world of instincts which from their side influence the ether body. While we previously accepted the proposition of Nageli, that the building and the function of organisms are in their main elements a necessary result of the forces indwelling in the substance, and therefore independent of external accidents, we must now supplement this in the following way : The building and functioning of the organism are a necessary result of the forces indwelling in the substance; these forces in turn are induced to their activity and guided in their organizing activity through spiritual and real impulses and instincts. That is, the forces build the bodily organism as a copy of spiritual archetypes, as a work-instrument for the incarnation of a. being. The siphonophoran is a creature which brings the phylogenesis also of this process visibly before our eyes.

In genesis, the will-endowed instinct-being must always first

be existent, in order that it may, either for itself, or else working in a common group with other beings, form in the world of substance, in the phenomenal world„ the living organism necessary for the incarnation !

And here we come upon one of the most decisive questions, which, has been more bitterly fought over in the scientific and religious world during the last century than has any other ; and rightly so, for it is one

of the cardinal questions for the evolution of human knowledge : the problem of the relationship between man and the animals.

The materialistic age has sought through most of its scientific representatives to prove that man is descended from the animals, that the human being is only an evolved animal being, the human soul only an animal soul which has ascended by means of adaptation and heredity. The religious world and some few schools of thought—which were attacked by the rest of the scientific world with all the means of a modem inquisition—have denied this theory of human evolution with the utmost determination and with full assurance of truth.

Which party gives us the truth ? We will endeavour to bring this to light by means of a comparison which will be intelligible to the representative of the animal-man theory also.

Contemporary research into cosmic evolution teaches us that the sun in the course of its evolution has thrown off the other planets and their satellites ; that these heavenly bodies thrown out of the central sun, which previously contained the entire solar system, have gone through a more and more altered evolution of that which happened within the central sun ; that they, moreover, follow’ this central sun in their orbits, encircling it at various distances. The sun threw the planets out from itself, pursuing in its evolutionary passage its way through the universe. The planets

thrown out from it, together with their satellites, accompany this, their source, and continue to follow it upon its journey through the universe in their various orbits.

The opinion that the sun is only a higher evolution than the planets and has arisen out of these would be considered scientifically false and illogical. But is the relation of man to the rest of Nature different from the relation of the sun to the other planets ? Whoever thinks scientifically will admit that the age of materialism has here fallen into a fallacy the consequences of which are very grave. The origin of this fallacy we can explain only on the ground of the too common habit of seeking to explain all living things according to quantitative and mechanical laws after the manner of an inevitable mechanical evolution.

In considering the forming cf the living organism, we have been able to perceive that the spiritual, the formative, the substance-creating and form-shaping, the creative, is primary; that it was before any beginning and also still is. That the living organism, on the other hand, represents the secondary, the shaped, that formed by the formative forces, the object of the creating, the created. The world of substance, Woven through by spirit, and the spiritual world working through our phenomenal world, are going through an evolution, in which wre all share. But just as the sun cast the planets out from itself in this process

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Heidelberg, 1911.

t All italics throughout are Dr. Wachsmuth’s.

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See in this connection the important pamphlet by L. Kolisko

which introduces a new point of view in regard to the subject: “ Milzfunktion und Plattchenfrage,’’ Stuttgart, 1922.

3

E.G.N.S., p. 244. f E.G.N.S., p. 194.

x E.G.N.S., p. 249.

4

A. Einstein, Sidelights on Relativity. I., Ether and Relativity, London, Methuen, 1922.

f p. 19. X p. 24. § p. 20.

5

R. Steiner, “Goethe’s Conception of the World.” London, 1928, p. 178.

6

W. Trabert, Meteorologie (re-edited by Dr. A. Defant), Berlin, 1918, p. 66.

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We beg that the reader, in examining these diagrams, will not think of the theoretical observer often imagined as floating out in space, but naturally entirely non-existent, but that he will think, rather, of an actual man on the surface of the earth.

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Stefan Meyer upd Egon R. von Schweidler, Radioaktivitat, Leipzig, 1916.

9

Johann Kepler, Harmonices Mundi, Lintz, 1619.

10

See also, in connection with this problem, L. Kolisko : ” Physiol ogischer und physikalischer Nachweis der Wirksamkeit kleinster Entitaten,” Stuttgart, 192310 which opens a new direction of research in this field.

11

A. Einstein: “ Ather und Relativitatstheorie,” p. 11.

12

New York, 1909.

fin Die Drei, February, 1926 (Vol. V., No. 11), the well-known Orientalist, Dr. H. Beckh, has brought out the most interesting fact in reference to the representation here given regarding the form-tendencies of the individual formative forces : that is, that the forms here used for chemical ether and life ether (the halfmoon and the square) were employed in Egyptian hieroglyphics for the name of the goddess ” Isis,” whereas in the Peruvian texts the forms here assigned to warmth ether and light ether (the circle and the triangle) were employed for the name of the corresponding goddess. The American mystery places, historically related to earlier cultural centres, are thus seen to have used as symbols for the creative principle the forms of the formative forces phylogenetically earlier, while the Egyptian places, belonging later, used the forms of those forces phylogenetically later. We wish to express our heartfelt thanks to Dr. Beckh for this remarkable reference. This whole complex question opens wonderful perspectives for future research. See also Dr. H, Beckh : ” Atherische Bildekrafte und Hieroglyphen,” in Gaa Sophia, Vol. I., 1926. In the second volume we shall recur to this subject.