The Doctrine of Mechanicalism

SCHOLFIELD

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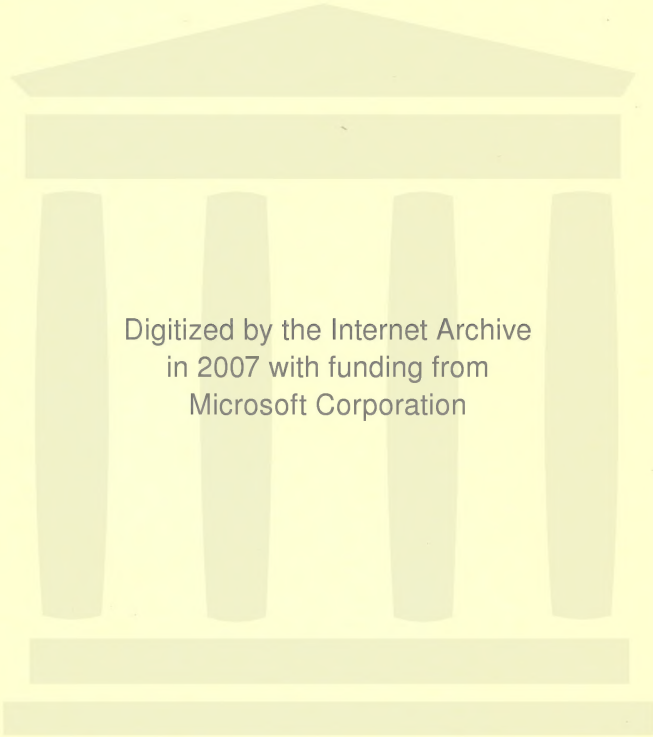
Socrates Scholfield.



THE DOCTRINE

OF

MECHANICALISM

BY

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INTRODUCTION.

DESCARTES advanced the hypothesis that brute animals having no souls, could have no true mental operations and no consciousness, and therefore, should be considered as insensible automata. Huxley contended that although in his opinion brute animals are automata, they are not to be considered as insensible, but as conscious automata; and that in this category man himself must be included. The thesis herein advanced is based upon the assumption that animal organisms are conscious fabricative machines, which are constructed and operated through the power of environing forces. And it maintains that if the governing factors of animal organisms are based upon the principles of mechanics, as embodied in the governing elements of analogous inanimate mechines, then a future state of conscious existence is reasonably assured, and important questions of metaphysics may be satisfactorily answered. The doctrine that animal organisms are dependently related fabricative machines, may be termed the doctrine of mechanicalism.

S. S.

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THE DOCTRINE OF MECHANICALISM.

I.

ANALOGIES OF GOVERNING ACTION.

Assuming for a primary postulate that animal organisms are conscious machines, the operations of which are in strict accordance with the specific nature of their embodied forces and the mechanical arrangement of their parts, it becomes a necessary sequence that the general laws of mechanical function which are applicable to the analogous correlated elements of inanimate machines should also be applicable to the corresponding correlated elements of the animal organism. And in following out this assumed analogy of function, we must necessarily be restricted to the mechanical terms applied to the related elements of the known inanimate mechanism, in order to prevent confusion and misunderstanding when thus making a comparison between the functional elements of inanimate machines and the corresponding elements of the animal organism, to which a terminology not applicable to the parts of inanimate machines has been heretofore applied.

In the terminology of mechanics, the words sensible and sensitive are used to characterize those material resilient elements which, through their quality of au-

tomatic reaction, are adapted to indicate the varying conditions of an impinging energy. And we may employ the word sensive, to specifically denote the immaterial sensible and sensitive elements which pertain to consciousness. Also, in referring to the parts of those inanimate machines which are adapted for the discriminate dispensation of energy under varying conditions, we may employ the word enginery, to denote that portion of the mechanism in which the energy to be dispensed is embodied, and the words governor, and governing mechanism, to specify that portion which serves to supervise and control the dispensation of the energy to meet the varying conditions. And these terms are in an equal degree applicable to the corresponding parts in animal organisms. But in order to provide a term which will denote a distinction between animate and inanimate governing mechanisms, the animate governing mechanism may be called the governing member.

Whenever, through empirical investigation, we trace the line of the transmission of neural energy for the development of regulated muscular movement in the animal organism, we fail to discover the required unitary dispensing governor, and find only an organic enginery, of which the brain constitutes the specific factor upon which the regulative governing medium must act. The multitudinous cells and fibers of the brain pertain only to the generation and transmission of the neural energy, and we are unable to discover in the brain the necessary unitary governing medium which serves to control and govern the dispensation

of the energy of the cells collectively, for the discriminate development of muscular action. Such a unitary governing element cannot reside in the sensory cells alone, for these cells have to do only with the development of sensibility; it cannot reside in the motor cells alone, for they have to do only with the development of muscular movement; nor can it reside in the neuroglia cells alone, for the amœboid fibers and processes of these cells, although adapted for co-ordination, are not connected with the fibers or processes of either sensory or motor cells. But in accordance with the established principles of mechanics, a unitary governor for the regulated dispensation of neural energy in the animal organism must necessarily exist,—although it is found to be imperceptible. Hence we may conclude that there exists in the animal organism an imperceptible unitary governing member, whereby the neural energy of the brain is dispensed for the regulated development of muscular action. This governing member, the function of which is to direct and govern the molar or mass movement of the several parts of the organic enginery, must, from a condition of quiescence or rest in all of its functionally operative parts, be able at any instant to direct energy in different and opposite directions, for the production of purposive muscular movement in the organic enginery, even in opposition to the dictates of sensation or emotion.

The dimensions of the organic enginery become increased through an accumulative corpuscular growth, and the required concomitant growth of the elements

of the governing member of the organism in harmony therewith, implies for these elements an analogous discrete origin. It is evident that governing functions cannot pertain to discrete unorganized elements, but only to organized elements formed of concrete aggregates. Hence we may posit that the co-acting elements of the governing member of the animal organism are discrete in their origin, and that the governing member consists of co-acting concrete elements, which being objectively imperceptible, may be considered as immaterial in their substance.

It has been maintained that the phenomenon of animal consciousness is the result of constantly recurring changes, or alternations of state, in a fundamental governing element of the organism; and since consciousness is completely annihilated in sleep, and is likewise excluded upon physical interference with the flow of blood in the brain, and since it does not persist continuously in the governing element, we may logically conclude that consciousness is the result of the action of an external energy upon the immaterial substance of consciousness in the governing member.

The governing pendulum of the clock receives at each oscilliation a slight impulse from the enginery, which serves to overcome the encountered frictional resistance, and thus to maintain the successive rising and falling movements of the pendulum weight as it swings back and forth in its curvilinear path, with the resulting production of alternating changes of gravitative stress during these rising and falling movements. And we may reasonably posit that analogous

mechanically induced changes of stress in the basic governing element of an animal organism will form the basis of a true consciousness.

That phase of consciousness which is mechanically developed in the governing member through objective sensation, may be termed sensive consciousness; that which is developed therein by subjective feelings, emotive consciousness; that through which objects of memory are apprehended, memorial consciousness; and that through which executive action is produced, executive consciousness.

The governing action of a spring is derived from the opposing forces of cohesion and heat; that of the oscillative pendulum, from the opposing forces of gravitation and suspension; and that of the rotary pendulum, from the opposing forces of suspension, gravitation and revolution. And these inanimate governing mediums are adapted for resilient action upon either side of their planes of static equilibrium, so that, when forcibly deflected to either side thereof, they return automatically to the median plane of their field of movement. Hence, by analogy, the sensive substance of consciousness in the governing member of the animal organism, should properly have a mediate state of static insensibility, to which it will return automatically when freed from the impinging action of either direct or inverse energies.

In accordance with this mechanical doctrine of consciousness, the production of conscious action within the governing member of an animal organism, from a received sense impression, may be schematically repre-

sented by means of the resilient action of a flat spring placed in an upright position and held rigidly at one end, while the opposite end is adapted for free movement. This freely moving end is provided with a pivoted pawl or other engaging means, which, upon the resilient return of the spring from a forcibly deflected condition, is so arranged as to be capable of engagement with a suitable power-dispensing medium, *e. g.,* the teeth of a sliding rack having power-dispensing connections. But the pawl is normally held from such engagement by means of a sensible governing medium. Now, if we forcibly impart a rythmic succession of backward impulses to the free end of the spring, alternated potential and kinetic states of molecular stress, and consequent resilient action, will be developed therein. And when, through the action of external energies upon the mechanically sensible governing medium of the schematic device, suitable engagement is made between the pivoted pawl and the power-dispensing element of the organization, then the inherent kinetic resiliency of the spring itself, acting as an executive agent, with the energy pertaining to the previously induced stress of its own molecular elements, will serve to impart the required executive movement.

Hence, by mechanical analogy, the initial impulse for every act of executive consciousness will be derived from the reaction of the executive medium of the governing member from a state of potential stress, which has been previously induced therein by the action of an external energy pertaining to the enginery of the

organism, the medium of executive consciousness being always free to act from its mechanically induced state of potential stress, whenever an opportunity is provided by the occurrence of the required change in the sensive governing medium which determines the appropriate occasion for conscious executive action.

Memorial consciousness may, in like manner, be schematically illustrated by means of a flat spring. Since, when the spring is deflected from its normal state of insensible molecular equilibrium, a memorial symbol of its previous insensible condition will be developed therein, in terms of molecular tension and sensibility, through the resilient energy of which, the spring is enabled to return to its former insensible state. And when the illustrative spring is provided with a significant configuration, the flexure of the spring will develop therein a memorial symbol of such configuration, in terms of molecular sensibility and energy. And this memorial symbol will persist so long as the spring is held in its flexed condition.

Hence we may conclude from mechanical analogy that the fabricated elements of memory are normally in a condition of insensible equilibrium, in which their contents are not within the limits of consciousness; and that when subjected to the induced stress of nerve-commotion, a consciousness of their contents will be developed in terms of resilient energy. Memory may, therefore, be defined as a fabricated representation of a previous experience, developed to consciousness by the energy of resilience.

In order to obtain any sensible action whatever in an inanimate machine, the resilient element of sensibility must be rigidly held and supported at a certain part of its organization by an unyielding medium, which medium operates as a fulcrum or support. And we find upon final analysis that every mechanical unyielding medium consists of a mass of molecular elements, which are maintained in static equilibrium through the balanced forces of cohesion and heat. Hence we may posit from mechanical analogy, that the immaterial resilient element of consciousness in the animal organism, may likewise, be provided with an unyielding medium of opposing immaterial elements, which serves as the necessary fundamental base for the development of resilient conscious action.

Now in every inanimate machine in which a sensible governing mechanism is so combined with a dynamic enginery that the machine will act automatically to suit the constantly varying conditions of an external medium, the governor has, in all cases, a removable relation to the enginery, and is capable of performing its inherent sensible functions when so removed, while the enginery will be rendered incapable of its previous sensible action. Hence, if it can be shown that a true mechanical analogy exists between the sensive elements of animal organisms and the corresponding sensible elements of inanimate mechanisms, then we may reasonably conclude that the governing member of the animal organism must, like the governing element of an inanimate machine, be capable of perform-

ing its inherent sensible functions when removed from the organic enginery with which it is connected.

For a well known example of the separable relation that exists between the dynamic enginery of an inanimate machine and its governing mechanism, reference may be made to the mechanism of a clock, in which, upon the removal of the sensible governing pendulum and the executive pallets connected therewith, from their operative engagement with the dynamic enginery, the suspended pendulum and its connected pallets will soon pass automatically to a state of static equilibrium, and will then be capable of oscillation in the same uniform intervals of time as before, whenever the resulting condition of static equilibrium is disturbed by the action of suitable external forces in the environment. But the stored power of the dynamic enginery will, in this case, soon be expended by the rapid downward movement of the actuating weight without useful effect, the hands of the clock having by the removal of the governing mechanism, been rendered incapable of indicating standard intervals of time. And no amount of rewinding will restore to the enginery its former time-keeping movement. Thus, the sensible pendulum of the clock and the connected executive pallets—which taken together constitute a governing mechanism—represent to us a mechanical organization which under certain conditions has an inherent capability for the independent performance of its specific function. And similar conditions of inherent, inlependent functional action pertain to all discriminative governing mechanisms in inanimate

machines. Hence by mechanical analogy, the corresponding elements of the governing member should also be inherently independent in the performance of their special functions, and, therefore, be separate and distinct in their natures from the dependent elements of the organic enginery.

But a more complete example of inanimate governing action was provided in a certain regulating governor employed for the purpose of regulating the speed of machinery driven by water power, where on account of the specific structure of the motive wheel a considerable interval of time was required for obtaining the full action of the water upon the wheel after its initial entrance into the revolving buckets. And in this regulating governor a differential compensating-adjustment was arranged to so operate between the speed-indicating and the executive or dispensing elements of the governing mechanism, that the action of the regulator would not be limited to the normal action of the speed-indicating governor during the latter half of the return movement from its extreme of variation, whereby, when the return of the speed toward its normal rate did not exceed a certain degree of rapidity, the action of the regulator upon the gate was, with mechanical discrimination, caused either to continue during the latter half of the return movement, or cease entirely, until the normal rate of speed had been reached by the continued action of the water upon the wheel. But when the speed was, for any reason whatever, returning with too great rapidity from its ex-

treme of variation, so that either the continuance, or cessation, of the action of the regulator upon the gate would allow the speed of the motive wheel and the connected machinery of the factory to swing to an opposite extreme, then the discriminative action of the compensating-adjustment served to cause the reversal of the action of the regulator upon the gate, so as to meet the rapidly returning rate of speed with the gate at the required height for continuing the rotation of the wheel at its proper uniform rate. Thus the regulator, through the action of the compensating-adjustment during the latter portion of the return movement of the governor, was caused to act discriminately with reference to a future contingency not at all related to the present rate of speed of the machinery, as indicated by the governor, but to an ultimate injurious action that would result from either a surplus or deficiency of water, as the case might be; and this compensation was effected by means of a discriminating change of adjustment between the speed-indicating and the executive elements of the governing mechanism. And by means of this change of adjustment, the regulator was enabled to act more rapidly on the gate during the first moments of any variation in speed, thus limiting in a great degree the extremes of variation, as well as correcting more rapidly any disturbed action.

The differential compensating adjustment employed in this regulator included in its scope a co-ordinative medium, by means of which the inherent sensibility of

the governor to occurring variations in speed, and the relative rapidity of its return movement, were co-ordinated with a memorial record of the spatial extent of the occurring variation from the zero plane of the governor; and the result of this threefold co-ordination was transmitted to the executive medium, to which, by its connection therewith, the inherent resiliency of the governor was imparted. The so connected sensible, memorial, co-ordinative and executive elements, constituted an integral, resilient governing mechanism; which, when removed from the dynamic gate-actuating enginery of the regulator to another field of rotative energy, would be capable of the same sensible action as before; but the gate-actuating enginery, although remaining intact, would be rendered insensible to variations in speed, and incapable of further regulative movement.

We therefore, find in this inanimate regulator, a schematic analogue of the sensation, memory, co-ordination and executive action that pertains to the governing member of the animal organism. But sensation and memory are not the sole controlling elements in the action of the governing member; for in connection with these elements we have the feelings of emotion. Hence it devolves upon us to bring forward an inanimate mechanism, which in its operation is schematically illustrative of an emotive function; whereby, through mechanical analogy based upon our schematic exhibit, we may arrive at certain conclusions in regard to the mechanism of emotion in animal organisms.

An analogue of the inhibitory action developed in the animal organism when subject to the emotion of fear is found in the stop-motions of various inanimate machines, since the fear of the occurrence of damage in the operation of the machine constitutes the specific reason for the employment therein of stop-motion devices. Hence we are enabled to point out in an inanimate regulating mechanism, the counterpart of actions which when performed by an animal organism would be the result of emotion. But a stop-motion does not perform an active part in a continuously operative mechanism. So in order to fully illustrate the nature of such a mechanism—of which we have an example in the compensating-adjustment of our model regulator—we will suppose that the proprietor of the factory should himself, by his own manual effort upon the gate, cause the water to flow to the buckets of the motive wheel in the same dangerous excess as is employed in the normal action of the regulator, in order to rapidly check an impending injurious variation in speed. Then in this case a feeling of faith in his ability to meet all the resulting requirements of danger must be exercised; while the necessary removal of such dangerous excess prior to the return of the speed to its normal rate, implies a fear of the resulting consequences of neglect. It is thus seen that the inanimate compensating-adjustment employed in our model regulator, which constitutes a continuously operative mechanism, performs the same regulative acts, that when performed by the proprietor of the factory would involve

the exercise of emotion. Hence we find in the inanimate compensating-adjustment of our regulator, an analogue of the governing action that is based upon emotion in the animal organism, wherby the compensating-adjustment may be properly termed an emotive mechanism.

Moreover, when we critically investigate the governing mechanism of our model regulator, we find that its governing action in rectifying a disturbance in the rate of speed is accomplished during the sensible movement of the balls of the governor first away from, and then back toward their normal plane of rotation; while at the same time the operation of the compensating-adjustment is such as to cause the taking up and retention of a portion of the outwardly transmitted movement, whereby an available store of potential energy is accumulated within the resilient field of the governor. And this potentiality, which constitutes the basis of the emotive or inhibitory action of the governing mechanism, is dispensed in full accordance with the specific regulative requirements during the latter half of the return movement. Hence we may conclude from mechanical analogy, that in the animal organism, a portion of the energies supplied to the governing member through the organic enginery, may be taken up and changed from a kinetic to a potential state, and thus constitute the required independent source of energy existing within the sensive field of the governing member, for the production of inhibitory or emotive governing action.

Furthermore, we find that in our model regulator the change from a kinetic to a potential state of energy within the field of the governor, for the production of emotive regulating action, is effected through the kinetic action of a positively driven clutch member which is independent of the governor. Hence we will be required in the course of this argument, to point out in the animal organism an independent energetic medium, which is capable of changing the kinetic energy that pertains to the sensibility of the governor, into the potential energy required for the development of emotive regulating action; and this independent medium must be adapted for kinetic engagement with the governing member, as in the inanimate machine.

Inanimate machines are, in all cases, provided with a connecting frame, which constitutes a rigid fulcrum or reactive base, for the dynamic action of the elements of the mechanism, and serves to hold these elements in their proper working relations. And by mechanical analogy, the several distinct factors of the governing member must, likewise, be provided with a connecting medium, which serves to maintain them in proper operative connection in the presence of adverse energies.

The governing elements of inanimate machines are dependent for their sensible indicative action upon external fields of potential energy, to which the governing elements are specially related. Thus, the magnetic needle, which is the specific sensible governing element for translatory movement in a horizontal

plane, derives its directive quality from the environing magnetic field of the earth, and upon its removal from the enginery still continues operative in its related field as before. So likewise the static pendulum or plummet, which is the specific sensible governing element for translatory movement in a vertical plane, derives its directive quality from the environing field of gravitation, and still remains operative in its field upon removal from the enginery. In like manner the compensating pendulum derives its uniform governing quality from the conjoint action thereon of the environing gravitative and thermal fields; and upon its removal from the time-indicating enginery to which it pertains, is capable of performing in these fields the same uniform oscillation as before. Hence by mechanical analogy, the sensive and emotive factors of the governing member of the animal organism, should have for their fundamental bases potent external fields, which are adapted to the continued maintenance of their sensive and emotive action when the governing member is removed from the organic enginery.

But while the governing member of the organism may be truly removable from the organic enginery, without incurring the loss, or impairment, of its inherent capability of the performance of discriminate governing action when mechanically stimulated to consciousness; yet, without the concomitant removal of a complementary element which is possessed of inherent energy, the removed governing member would be incapable of such action, owing to the lack of an ener-

getic factor adapted to develop the resilient energy of consciousness in the normally insensible governing member, and also on account of the lack of a suitable medium for the developed energy of consciousness to act upon. Hence it devolves upon us to point out, in the succeeding chapter, that specific removable element of the organization, by the co-action of which with the removed governing member, the inherent capability of conscious action may be developed and exercised.

II.

ANALOGIES OF CONSTRUCTIVE FABRICATION.

If animal organisms are in fact mechanically governed machines, it is evident that the building up of the organism from its elements should be governed by the general laws of mechanical constructive fabrication. Hence, in order to acquire a true conception of the nature and purpose of the organic structure, we may properly rely upon analogies derived from our knowledge of the special agents employed in the fabrication of analogous inanimate mechanisms.

The fabrication of an extensive and complicated mechanical structure requires the accumulation of the proper building materials at the place of manufacture, together with the employment of a sufficient number of workmen under the directive control of a supervisor, who is the custodian of, and comprehends the working plans of the proposed organization; and in the absence of supervising control with reference to a special plan of mechanical construction, the workmen, then compelled to act disconnectedly and without knowledge of a specific dimensional specification, would of themselves be entirely incapable of organizing the required extensive and complicated structure from the provided building materials.

In building up the vertebrate animal organism from the fertilized embroyonic cell, the material elements employed are the continuously divided protoplasmic cells, which, with their microsomes or ultimate cell-elements, collectively constitute the organic enginery, and individually perform different functions in accordance with their relative positions in the organic structure. And we may conclude from the analogies of inanimate mechanical structures, that the functional differentiation of the cells in accordance with their relative positions must be determined by a sensive supervising member, which, in its nature, must be as separate and distinct from the individual cells, and from the fabricated organic enginery, as the supervisor of the building of a mechanical structure is separate and distinct from the structure itself, and from the workmen by whom the structure was made.

The human supervisor of the fabrication of a mechanical structure obtains the governing control of the separate independent workmen by the dispensation to each of them of certain stipulated wages, derived from a potential monetary field pertaining to the owner or proprietor of the structure to be fabricated, which field constitutes a conventional embodiment of accumulated energy; and without this supervising dispensation of accumulated energy from the monetary field of the proprietor, or its equivalent, the workmen, through lack of material support, would be unable to proceed with the building. Hence, we may conclude from analogy that the governing control of the individual protoplasmic cells, for the production of an organic structure,

is attained through the mechanical dispensation, to each of the cells, of a form of potential energy which is derived from an external field, and differentiated to the cells in accordance with a representative plan or model of the proposed organization. And the dispensating or promoting element of the animal organism, through the mechanical action of which the required dispensation and differentiation of fabricative energy is effected, may be termed the executive promoting member, which may be considered as identical with the subconscious self of hypnotism.

The mechanical dispensation of differentiated energy to a collection of separate and distinct inanimate entities, for the production therefrom of an integral differentiated fabric, is illustrated in the process of photography, wherein the uniform radiant energy of the environment, primarily differentiated by impingement upon the reactive form of the object to be photographed, and again differentiated by means of the lens of the camera, causes a correspondingly differentiated action upon the surface of the chemically prepared plate, with the resulting production of a pictured representation of the form of the object. In this case, the surface molecules of the chemically prepared plate represent the workmen; the reactive object represents a medium to which the uniform field of radiant energy is referred for primary differentiation; and the lens constitutes a medium which selects the required differentiated rays and transmits them in their selected form to the molecular workmen, with the resulting production of a symbolic representation of the external form of the object on the surface of the plate.

And when we pass from inanimate material molecules to cultures of independent living bacteria, we find that they, through their thermotactic or phototactic properties, may have their characteristic qualities changed, and their individual movements controlled, in accordance with a specific plan, by means of differentiated radiant energy.

Hence, if the differentiation of radiant energy will cause uniformly distributed inanimate molecules of matter to become differentially transformed into pictorial symbols and also cause the differentiated arrangement and rearrangement of the separate individuals in cultures of living bacteria, we may reasonably conclude that the transmission by the executive promoting member, of a specific form of constructive energy, differentiated from the uniform energy of the environing field, in accordance with a true model of hereditary organization, would enable the sensive individual cells—the organic workmen—to build up a complete multicellular organism, in strict accordance with the special characteristics of the transmitted energy.

We therefore posit that there exists in the animal organism an executive promoting member, having as a function the transmission of differentiated energy to the individual cells by means of a constructive model of hereditary organization, which model pertains directly to the province of the promoting member. And we may term this necessary constructive model, the representative medium.

It has been assumed that the stress of resiliency constitutes a mechanical representation of consciousness,

and that the consciousness of the governing member is conditioned upon the action of external energies. It is essential, however, for the proper development of the physical functions of the organic enginery, that the consciousness of the promoting member should be unconditioned and unceasing, and this form of consciousness may be schematically represented by means of two spiral springs of equal diameter, which are formed of the same size and quality of wire, and have the same number of coils, with the space between the coils of one of the springs made greater than that of the other, whereby the length of the spring will be increased. These two springs are to be screwed together longitudinally, so that the coils of the one will intertwine, side by side, with the coils of the other, with the axes of the two springs coincident; then, through the resulting extension of the coils of the shorter spring and the drawing in of the coils of the longer one to an equal length, a permanent state of stress will be produced in each of the intertwined springs. The inherently shorter spring constitutes a reactive factor, serving to intensify the resiliency of the inherently longer spring, while the molecular stress caused by the mutual antagonism of the springs serves to maintain therein a constant and unceasing state of molecular sensibility. And we may assume from mechanical analogy that there exists an unceasing state of consciousness in the promoting member, due to the stress resulting from the combination of a controlling sensive substance of consciousness, with a reactive sensive substance, the one substance con-

stituting the positive and the other the negative element of the same resilient medium of consciousness.

When we consider the specific action of each of the unequal schematic springs, which, when intertwined have been mutually forced to an equal length, we find that the positive controlling element of the organization resides in the longer spring which is under the stress of compression, while the shorter spring is under the stress of extension. Hence we may posit from mechanical analogy that in an ever-conscious organization, the unceasing consciousness of the controlling element, pertains to a resilient field which lies inside of its state of inherent stable equilibrium, while the field of the unceasing consciousness of the concomitant reactive element, lies outside of its state of inherent equilibrium, whereby, it can have no power whatever of outward action.

The executive promoting member is able to supervise not only the initial building of the organism, but also the reconstruction of injured or removed portions thereof, which are often very complicated in their natures. And in some cases, where an injury has been inflicted upon an important portion of the brain tissues, the remaining uninjured portion will, under the supervising action of the promoting member, be transformed into a mechanism which is capable of performing the missing function of the injured or lost tissues. Hence it appears that the promoting member has an active function to perform in the fully completed organism as well as during its initial development, and may, therefore, be considered as the requisite dispenser of energy for carrying on the true fabricative functions

of the completed organic mechanism. And since both the nervous and vascular systems of the organic enginery are to be built up by means of energy supplied through the executive promoting member, and simultaneously differentiated to each of these systems, through the representative medium of hereditary organic structure, we must necessarily conclude that the promoting member is functionally related to both the vascular and nervous systems through which the complete fabrication of the organic structure and its repairs are effected; while the governing member pertains particularly to the nervous system, by means of which the operative action of the organism in its environment is to be controlled and regulated.

In the previous examination of our model regulator we found that the change from a kinetic to a potential state of energy within the field of the inanimate governor, for the production of emotive regulating action, was effected through the action of an energetic medium which was independent of the governor. We may now conclude that the executive promoting member which dispenses potential fabricative energy from a related external field, for the complete building up and maintenance of the animal organism, and which in its action is independent of the governor, may constitute the requisite energetic medium for the development of feelings of emotion in the governing member.

Upon the removal or inhibition of a mechanical governing element in an inanimate machine, either the intelligent builder of the mechanism or the operator thereof, may assume control and in accordance with

his native skill supply the function of such mechanical governing element, and guide the power-dispensing portion of the machine at his own volition. So, in the phenomenon of self-hypnotism or spiritism, the voluntary surrender of normal governing consciousness by the medium, whereby the normal action of the governing member is inhibited, allows the everconscious promoting member—the intelligent builder and maintainer of the organism—to assume control and operate the organic enginery at its own volition.

The magnetic needle when employed as a governing medium may be deflected from its normal governing direction and have its poles reversed by the close proximity thereto of another magnetic needle, which latter when acted upon by energy is capable of usurping the governing function of the former. So, in the phenomenon of animal hypnotism, a forced change of relation between the governing elements which pertain to individual consciousness and their reciprocal fields, effected through the action of the hypnotizer, may result in the inhibition of individual consciousness, and the usurpation of the control of the enginery of the subject by the governing member of the hypnotizing agent. And we may reasonably posit that in this case, as in spiritism, the organic enginery of the unconscious subject is operated through the medium of its everconscious promoting member, which member is now controlled in its action by the governing member of the hypnotizer.

The acquirement of a true comprehension of the existing condition and real fabricative function of the animal organism has been rendered difficult, by reason

of a radical illusion, which consists in the universally prevailing conception of the nature of sensible light, as something that really exists in environing space precisely as recognized by visual consciousness; but which is, on the contrary, a fabricated product existing solely within the limits of the governing and promoting members of the organism.

The normal sensation of light is produced by the occurrence of physical wave motion in the environing ether, the amplitude of the ethereal waves which serve to impart the sensation of light to the sensive visual element of the governing member, as distinguished from the amplitude of the similar waves which result in a sensation of darkness, in nowise changing the physical constitution of the ethereal medium in which the waves are propagated. Hence, between the animal eye and the objects in the environment, there exists mere physical motion in the ethereal medium.

The sensation of sound is likewise produced in animal organisms by the effect of mere undulatory motion in the environing air, which motion serves to fabricate the sensation of sound in the auditory element of consciousness. Therefore, it must be considered that animal organisms are fabric-producing machines employed in transforming the physical wave-motion of the environment into varied nerve-commotion and sensation, with the consequent fabrication of sense-representing factors, and fabrics of memory. And it is only through individual comprehension of the fact that what we recognize as light, color, and sound have no objective reality as such, but exist only as a fabricated state of animal consciousness, that we can be at all

prepared to realize the true fabricative importance of the animal mechanism, and the nature of the immediate future condition of the promoting and governing members of the animal organism, when they are separated from their joint organic enginery and material environment.

The value of a machine resides solely in its continued capacity for the production of a desirable product; and we find that the manufactured products of the fabricative animal organism consist of a stable fabric of memory that pertains to the conscious governing member, and a stable fabric of memory that pertains to the everconscious promoting member, together with certain stable sense-representing factors, which are stored up within the sphere of the promoting member for the subsequent fabrication therefrom of potential sense-symbols, adapted for inverse presentation to the consciousness of the governing member, as observed in the phenomenon of dreams.

For every fabricative machine there should exist not only a constructing agent and an operating agent, but also an agent for receiving the manufactured product. The constructing agent of the animal organism has been termed the executive promoting member; the operating agent, the governing member; and that medium through the action of which the sense-representing factors are stored up and the sense-symbols fabricated therefrom reversely presented to the governing member, may be termed the presentative medium of the promoting member.

The impressible wax cylinder of a phonograph derives its progressive movement from the rotary spindle

of the operating mechanism, and upon its continued rotation receives upon its impressible surface indented symbols of sound, fabricated thereon through the transmission of differentiated aerial undulations from an outer source of vocal energy to the resilient diaphragm and its connected stylus, which, taken together, have the resilient characteristics of a governing mechanism. The indented wax cylinder, when removed to a new environment, and rotated as before, is capable of so differentiating the energy transmitted through the fabricated symbols as to reproduce in the governing diaphragm the same resilient vibrations and changes of molecular stress that were produced therein when the symbols of the sound vibrations were originally fabricated, these vibrations serving to reproduce, in the environing atmospheric field inversely directed images of the original vocal undulations.

The fabricated symbols upon the wax cylinder, and the inversely directed images of the original sound vibrations returned to the atmospheric field, are entirely distinct from each other in their natures; but their fabrication is accompanied with the same resilient vibrations and changes of molecular stress in the governing diaphragm. And it may be reasonably concluded, that the analogous production of inversely induced changes of stress in the ultimate governing element of an animal organism will result in the development therein of inverse consciousness.

The rotary spindle of the phonograph, upon which the impressible wax cylinder is placed, may analogically represent the promoting member of the organism, which derives its potential action from a related

field of energy; and the wax cylinder may represent the presentative medium of the promotive member, by means of which, the fabricated sense-symbols are inversely presented to the consciousness of the governing member. And the tracing stylus, which serves to transmit energy to and from the governing diaphram, may analogically represent a subjective enginery which pertains to the governing member, and by means of which the governing member is enabled to act within the sphere of the presentative medium of the promoting member, as is observed in dreams.

Upon physiological investigation we find that sensory nerve-commotion does not pass by a continuous neural connection from one nerve cell to another, or from a nerve cell to other cells of the brain; but in all cases passes through an intervening medium. And we further find that, in every inanimate fabricative machine, the special mechanical elements which occur at the immediate place of fabric manufacture are, in like manner, not continuous with each other; but there exists a space between them which is occupied by the material from which the fabric is to be formed. Mechanical analogy, therefore, demands that the material from which the sense-representing factors are to be formed, in animal organisms, must be found between the discontinuous nerve fibers and the opposite cell processes; whereby, upon the passage of the nerve-commotion from the one to the other through an intervening medium, the required fabrication will be effected.

The neuroglia cells which are very thickly distributed throughout the brain tissues are amœboid, and

provided with numerous fine processes, which extend in various directions between the sensory nerve-cells; and since these neuroglia cells are enabled to expand or retract their fine hair-like processes, they are mechanically adapted to cause a change in the space between the disconnected fibers and processes of the nerve-cells, and also between these fibers and processes and the blood-vessels or capillaries. And furthermore, the constantly varying dilation of the blood-vessels will also serve to vary the distance between the cell-fibers and the processes. It is thus seen that the objective elements of the brain enginery are adapted for mechanical action, as may be required in the fabrication of the sense-representing factors from which sense-symbols are to be formed.

We also find that, in every inanimate fabricative machine, the manufactured fabric is distinct and removable from the mechanism by means of which it was formed. Hence from mechanical analogy, the fabricated sense-representing factors and the fabrics of memory must be distinct and removable from the organic enginery through the action of which they were produced.

The materials from which the sense-representing elements are derived must be obtained from the blood, which pertains to the province of the promoting member. The blood of vertebrates contains an immense number of independent red corpuscules of microscopic dimensions, which in animals of cold-blood are provided with a controlling nucleus; and although they are non-nucleated in mammalian blood, they were originally developed from amœba-like cells

provided with a nucleus, which was subsequently removed during a metamorphosis in which the protoplasm of the cell was greatly changed in its character. As many as five millions of these independent red corpuscles deprived of a nucleus, are found to exist in every cubic-millimetre of mammalian blood,—which constitutes a mass of less size than an ordinary pin head. Hence, we may conclude that the sensive elements of the innumerable cell nuclei, which are set free from the original nucleated cells during their metamorphosis into non-nucleated red corpuscles, may provide the required discrete sensible units from which specific sense-representing factors and fabrics of memory may be formed.

In the same cubic-millimetre, together with the red corpuscles will be found upwards of ten thousand white corpuscles, or leucocytes, which, being amœboid, are able to migrate at will into and out of the blood-vessels, many of them from their power of ingesting foreign substances being termed phagocytes or eating cells whose sensibility for objects at a distance has been termed chemiotaxis, and their very highly developed tactile sensibility, physiotaxis. These sensible independent leucocytes constitute active therapeutic agents of the promoting member, in the healthy maintenance of the organic enginery, and must necessarily be provided with sensive governing elements, whereby their sensible movements are regulated, and therefore, upon their dissolution, must be capable of providing the required sensive elements for the complete development and growth of the conscious governing member of the organism. And in addition to the blood

corpuscles, the endothelial and tissue cells may also in their disintegration, provide the required sensive fabricative elements. Hence we may conclude that organized fabrications, composed of these elements, may be effected in the animal organism upon the occurrence of varied nerve-commotion at the intersection of the fibers and processes of the nerve-cells with each other, and with the conductive vascular capillaries by means of which capillaries the required materials for such manufacture are continuously brought forward, and made to pass between the co-acting elements of the nerve-enginery, as in an ordinary fabricative machine. And since the sensive fabrications of the organism are thus derived from discrete elements, these fabrications must themselves consist of concrete aggregates.

That the co-acting elements of the promoting and governing members of the animal organism are concrete in their substance is fully evidenced by the fact that, at the primary subdivision of the embryonic cell in the development of the vertebrate, amphioxus, the promoting and governing elements of the developing organism may be subdivided by the forcible separation of the daughter cells from contact with one another, with the resulting production of several complete multicellular organisms, instead of the single multicellular organism which results from a normal uninterrupted development, but of a size diminished in proportion to the extent of the subdivision. Hence it is seen that the immaterial sensive elements of the promoting and governing members of the animal organ-

ism, are, under certain conditions, capable of being divided into separate individual parts without the loss of promoting and governing function.

The promoting and governing elements of the animal organism are capable of growth; but growth implies the collection and assimilation of the required discrete sensive elements from an external source. Hence it is evident that discrete sensive elements must exist in nature, from which concrete sensive mechanisms may be formed, which are adapted for the promotive development and controlling government of the engineries of individual animal organisms.

When the sensible governing elements of an inanimate regulative mechanism are removed from the connected dynamic elements, the regulative function of these dynamic elements will be destroyed; and when the removed sensible elements are again returned to the dynamic elements, their regulative functions will be restored. Hence we may reasonably conclude that primordial organic life was the result of the combination of an unstable material mechanism, with a stable, immaterial promoting and governing mechanism.

The structure and composition of animal cells is substantially the same as that of vegetable cells. Herbivorous animals feed upon vegetables, and the carnivorous feed upon the herbivorous, so that all animal organisms depend absolutely upon vegetable organisms for their being; and since all animal life depends upon the constant multiplication of vegetable cells, these cells must be in immediate fabricative connection with the primal source of the discrete sensive

elements from which the promoting and governing factors of both vegetable and animal cells are derived.

Vegetable organisms exist in the air, under the surface of water in rivers and ponds, and in the depths of the sea; hence the supply of discrete sensive elements required for the full development of the newly formed vegetable cells, which are being constantly built up from inorganic materials, must exist in a continuous field of these sensive elements, which surrounds the earth, and extends from the highest limit of living organisms in the air, to the lowest limit thereof in the sea, with a maximum thickness of about ten miles. The field of sensive elements, so defined, embraces the terrestrial organic factory, within which all organic mechanisms are constructed and operated. We may, therefore, reasonably posit that the substances of consciousness for both the governing and promoting members of the animal organism are originally derived, through the medium of vegetable organisms, from the discrete sensive elements of consciousness, which exist in a continuous field throughout the terrestrial factory.

III.

ANALOGIES OF FACTORIAL OPERATION.

ANIMAL organisms, like the machines in a factory, are dependently related and reciprocally connected during the fabrication of their memorial and sense-representing factors. Hence the laws that govern the factorial operation of inanimate machines should also be applicable to the analogous factorial operation of fabricative animal organisms.

Every manufactory for the production of inanimate fabrics is provided with an owner or proprietor, in accordance with whose will and purpose the fabricative operations are organized and from whom the promotive energy for fabrication is derived. Factorial mechanical analogy therefore requires that the terrestrial organic factory, also should exist under the control of a proprietor, in accordance with whose will the animate organisms of the factory are constructed, and their fabricative operations governed and regulated. And this governing and regulating proprietor of the terrestrial factory may be termed the Proprietor and Regulator of Energy, and the Supreme Governor of the animate organisms of the factory.

We find existing in every inanimate governing and regulating medium an element having inherent sensi-

bility, an element adapted to prevent the uncontrolled expenditure of the energy the specific action of which is to be regulated, and an element adapted for the dispensation of the controlled energy in accordance with governmental requirements. Hence we may posit that there must exist in the Supreme Governor inherent sensibility and the power of controlling and dispensing energy, in accordance with the specific requirements of the factory.

Now, in proceeding to determine the inherent moral nature of the Supreme Governor from the available data of factorial mechanical analogy, we find that, in every extensive manufactory for the production of inanimate fabrics, oppositely directed actions are required in the speed-regulating mechanism of the factory, to compensate for the occurring variations of mechanical resistance developed in the fabricative operations, and to maintain the desired uniform rate of speed in the fabricative machinery. And oppositely directed actions are required in all inanimate governing and regulating mechanisms.

The governing captain of a steamship transmits peremptory orders to the executive helmsman, which, when carried out, may cause the ship either to be kept steadily on its course or turned from it, in either of opposite directions as the case may require; and the helmsman dispenses the required energy for causing the ship to be so guided. The engineer of the ship, also, constitutes an executive dispenser of energy, subject to the command of the governing captain, and has the power of opposite action in opening and closing

the steam valve, for either starting or stopping the propelling engines of the ship, or for changing the direction of their rotary movement. Hence it appears that oppositely directed actions are required in animate, as well as in inanimate, governing and regulating mechanisms.

The natural increase of animal organisms, if unchecked, and subject only to the limitation of old age, would be much greater than the coincident increase of the vegetable organisms adapted for animal food; so that life within the terrestrial factory could attain no proper stability without the employment of a negative regulating action, by means of which the superabundant increase of animal life could be economically destroyed. Hence the regulated destruction of animal life is absolutely necessary for the promotion and proper maintenance of the factorial fabricative operations; and for effecting this regulative destruction, pathogenic germs and carnivorous animals in abundant numbers have been provided. And since the fabricative operations of the terrestrial factory necessarily require for their fundamental basis the promotion of animal life, the Supreme Governor of the factory must be able to dispense discriminately the specific energies required, both for the promotion and destruction of life.

Every governing medium must, in accordance with the true laws of mechanics, be related to an external reciprocal field with which it harmonizes: the action of the governing magnetic needle requires an external magnetic field, the action of a gravitative

pendulum requires an external gravitative field, and that of a resilient governing diaphragm an external resilient field. And we may conclude from mechanical analogy that the manifestation of conscious intelligence in the governing member of an animal organism, must imply a conscious intelligence in its reciprocal field.

We find, in the unicellular organisms of the factory, an individual sensibility superimposed upon the sensibilities of myriads of independently moving microsomes, or ultimate cell-elements, existing within the enveloping cell structure. And in the multicellular animal organisms, we find an individual consciousness superimposed upon the collective sensibilities of myriads of cell-units, which live and move independently within the enveloping field of the higher conscious organism. We may, therefore, conclude that in like manner the Supreme Governor may have an intelligent consciousness superimposed upon the intelligent consciousness of the fabricative organisms of the terrestrial factory.

Factorial mechanical analogy, therefore, discloses a Supreme Governor endowed with a promotive energy for beneficent organic fabrication, and a destructive energy for beneficent regulating action, and also endowed with conscious intelligence.

Now while the beneficent promotive functions constantly performed by the acting beneficent organisms of the factory, imply the attribute of beneficence in the controlling Supreme Governor, and while the destructive functions necessarily performed in the reg-

ulation of the terrestrial factory, may also imply the attribute of beneficence—as when a destructive surgical operation is performed for the benefit of the individual operated upon—yet, in many of the organisms of the factory, we find an innate disposition to destructive malicious action, which attribute of malevolence can have no place whatever in the nature of the beneficent Supreme Governor of our hypothesis.

Since action and reaction are equal and in opposite directions, the production of any dynamical movement whatever will require an independent reactive base or fulcrum, which does not partake of the desired movement, but by its inherent reactive nature serves to impart thereto the proper directive quality. Hence, we may conclude that the beneficent Supreme Governor of the terrestrial factory, like every other entity adapted for the dispensation of energy, must employ an independent reactive medium as the required base for the outward manifestation of inherent attributes, and that the dynamics of beneficence necessarily requires for its independent reacting base an adverse maleficent medium.

The attribute of malevolence, which embraces in its nature the wilful injury of others, found in certain organisms of the terrestrial factory will not, therefore, pertain to the inherent nature of the Supreme Governor, but only to an independent maleficent element, by means of which the beneficent attribute of the Supreme Governor is to be dynamically disseminated. And this maleficent element, which constitutes the necessary reactive medium for beneficent factorial action, may be termed the Adverse Medium.

We have heretofore posited that a state of unceasing consciousness requires for its fundamental basis a state of unceasing stress. The beneficent attributes of the Supreme Governor, and the maleficent attributes of the Adverse Medium are together exercised in intimate connection, throughout the whole extent of the terrestrial factory. Hence we may reasonably posit that the mutual unceasing opposition which exists between the Supreme Governor and the co-extensive Adverse Medium, will serve to maintain in each a true unceasing state of consciousness. The Supreme Governor and the Adverse Medium will thus constitute dependently related entities, the development and exercise of the inherent attributes of the one, being absolutely required for the development and exercise of the inherent attributes of the other.

The active energy of molecular repulsion caused by heat, and the concomitant reactive energy of cohesive attraction, provide a never-ceasing state of stress in all material substances. Hence there exists throughout the whole extent of the terrestrial factory the fundamental element of a never-ceasing consciousness; whereby the everconscious Supreme Governor may be truly cognizant of occurring physical phenomena. The molecular stress caused by gravitation and revolution may also provide a basis for the cognizance of the material conditions of the factory. Heat constitutes the fundamental variable factor upon which the fabrication of all animate existences depends and may, therefore, be considered as pertaining to the

physical field of consciousness in the Supreme Governor, while the reactive energy of cohesion which is opposed to the molecular action of heat, will pertain to the physical field of consciousness in the reactive Adverse Medium.

In the manufacture of inanimate fabrics, the provided raw material is passed successively through the several machines and processes of the factory, to the final completion of the desired fabric. Hence we may conclude from analogy that the fabricative operations of the terrestrial factory also will be carried on successively; whereby the constituent stable elements of vegetable cells will, through the nutritive assimilation of the cells by an animal organism, be promoted to become constituent stable elements of animal cells, and the stable elements of the individual animal cells be promoted to become stable elements in the governing and promoting members of the animal organism to which they pertain. And we may further conclude that the governing and promoting members of the animal organism, will, in like manner, upon the occasion of their mortal metamorphosis, be transferred as constituent elements to a higher organization.

It is found that, at the initial building up of an animal organism from its elements, some of the dividing cells are necessarily appointed to the performance of the various operative functions of consciousness in the organism, while others must necessarily become subservient structural units in the reactive and resistive skeletal frame, by means of which the organism is enabled to act objectively. Hence, we may conclude

from analogy, that the conjoined promoting and governing members of the beneficent individual organisms of the terrestrial factory, are destined at the completion of their mortal metamorphosis to become conscious individual units in the active field of the Supreme Governor; while the conjoined promoting and governing members of the oppositely constituted maleficent organisms, are destined to become conscious individual units in the reactive field of the Adverse Medium.

But, notwithstanding the fact that in the normal development of a vertebrate animal organism from its ancestral cell, certain specific cells of the primary subdivisions are destined to form the skeletal frame, and others to form the tissues of the enginery, yet, by the application of external pressure, the relative positions of the dividing cells may be so changed that those individual cells which would otherwise have been relegated to the tissues, are now relegated to the osseous structure, and those that would have been transformed into the osseous elements will now become component elements of the tissues. Hence, by analogy, while the individual organisms of the terrestrial factory, like the normally developing cells, can have no inherent power of changing their own natures, yet their constitutions may be changed and modified by the action of external influences, whereby the naturally beneficent organisms may be caused to become actively maleficent, and the naturally maleficent, to become actively beneficent; and this change in the nature of the individual organism can be derived only, from the action

thereon of an oppositely constituted beneficent or maleficent factor, the former pertaining to the righteous promotive field of the Supreme Governor, and the latter to the unrighteous reactive field of the Adverse Medium.

The effective action of certain inanimate fabricative machines depends upon the strict orientation of certain parts of their mechanism in line with the energy of cosmical gravitation. And it is readily apparent that, in the case of the analogous fabricative human organism, its proper beneficent action will depend upon the fabricative orientation of the governing and promoting members thereof, in line with the energies of the righteous beneficent field of the Supreme Governor of the factory, which orientation may be acquired and maintained by acts of beneficence and worshipful veneration performed by the individual organism. And wherever within the terrestrial factory, acts of true righteous beneficence are being performed by an individual organism, the intelligent Supreme Governor will be cognizant thereof, and in the reverential performance of such acts be objectively worshiped. And since the inherent attributes of the Supreme Governor can be made manifest only through the beneficent action of the righteously disposed individual organisms of the factory, the refusal of an individual to act as a medium for the factorial promotion of righteousness and beneficence, must constitute a true rejection of the beneficent Supreme Governor, and a virtual alliance with the maleficent Adverse Medium.

IV.

SUBSTANTIAL REALITY IN DREAM PHENONENA.

THROUGH the employment of alphabetic units, the printer is able to produce various concrete embodiments of the ideas which constitute the basis of a literary composition, the printed impressions of which, are presented by him to individual consciousness. So likewise, in dreams, the ideas of the intelligent ever-conscious promoting members are embodied in concrete sense-symbols, formed from the previously fabricated discrete sense-representing factors thereof, and presented to the consciousness of the governing member for the exercise of its volition in connection therewith. And as the printer may at will reduce his concrete embodiments of literary ideas back to their discrete alphabetic units, and thereafter, produce other literary embodiments therefrom; so the intelligent promoting member may, at the conclusion of the dream, disintegrate the presented sense-symbols, and reduce them to their discrete sense-representing factors, for the subsequent production and presentation of other symbols from the same discrete elements.

The sense-symbols which are presented to the governing member in dreams, may be classified as either static, dynamic, or sensible. The static sense-symbols

are those which represent stationary inanimate objects; the dynamic are those which represent inanimate objects having within themselves the inherent quality of motion; and the sensible, are those which represent and embody the special functions of animate organisms.

In the critical investigation of dream phenomena, we discover that the governing member is provided with subjective mechanically operating members, which, to every test of inverse visual and tactual consciousness are the exact counterparts of the corresponding members of the outer organic enginery; and like those members are under the complete control of the conscious governing member. Hence we find in the animal organism both material and immaterial engineries, the former existing at one side, and the latter at the oppsite side of the resilient element of governing consciousness; whereby, upon the removal of the outer organic enginery from the conjoint promoting and governing members, the immaterial subjective enginery will still subsist, and provide the requisite mechanical factor for continued conscious action.

When the animal organism is awake, the sensibility of the governing member is derived from the transmitted energies of the material outer environment; but when in the dream state, its sensibility must be derived from the inversely transmitted energies of the immaterial promoting member, which member has the power to arrange the various sense-symbols in their proper order and sequence, for dramatic and scenic presentation to the consciousness of the governing

member, while the governing member through the medium of its immaterial subjective enginery, is able to forcibly change the condition of certain contiguous sense-symbols, whereby the independent individual purpose of the governing member in relation thereto, may be effected.

That the sense-symbols from which the visual sense-images of dreams are formed are actual entities endowed with a form of energy is shown by the fact that the static sense-symbols observed in dreams may be divided into parts, and broken in pieces, by the forcible action thereon of the subjective enginery of the governing member, with an accompanying inverse sensation of resistance, similar to that direct sensation which would occur in the case of material objects in the outer environment. These divided parts of immaterial sense-symbols are able to maintain their visual and tactile integrity, until dissolved into their original discrete elements by the removal of the volition of the promoting member, through the fabricating action of which they were originally produced.

It is clearly evident that when the environing objects and a percipient individual organism are at rest, there can be no appearance whatever of movement in the field of visual consciousness. Hence, when in dreams the visual images of moving objects are perceived, we may be certain that these visually perceived objects are real moving entities, and that when the appearance of true perspective is preserved between them—as it surely is in dreams—we are dealing with substantial objects formed of immaterial elements, existing in a subjective field of three dimensions.

The promoting and governing factors of a developing animal organism may, in certain cases, be subdivided without the loss of promoting and governing function in the several distinct parts of the subdivision. Hence, when we observe in dreams true representations of conscious individual intelligences which are capable of sensible intelligent action, we may reasonably consider that these intelligences have each been endowed with a divisional form of the consciousness of the promoting member, and that they are subject to the promoting member in the performance of their functions.

The field of dreams—which is the presentative field of the promoting member—provides a subjective environment, which, to the inverse consciousness of the governing member is a counterpart of the objective environment that constitutes the terrestrial factory; and hence, is manifestly appropriate as a field for the performance of the inherent functions of the governing member in a continued state of conscious existence. And by assuming that the coaction of the promoting and governing members in the dream state of the organism is analogous to their coaction when they are removed from the organic enginery in the mortal metamorphosis, we will be able to descibe clearly, the future condition and operative function of the governing and promoting members.

V.

ANALOGIES OF ANIMAL TRANSFORMATION.

Upon an empirical investigation of the phenomenon of animal metamorphosis, we find that, for every transformation that occurs in the life of an animal organism, there must have been a preceding preparatory stage, in which the necessary materials for effecting the coming change were collected from the environment, and assimilated by the organism. We also find that the physical organs required for initial action, at the opening of the changed life condition, must have been first built up, and in a more or less restricted degree exercised, preparatory to the coming transformation. Or, in other words, for the most essential functions to be performed in any changed state of existence, such function must have been in some limited degree performed in the immediate prior condition of the organism.

Hence, if the extinction of the physical life of an animal organism implies a transformation from one life condition to another, through the removal of the promoting and governing members from their joint organic enginery, a prior fabricative preparation for such a transformation is necessary. And since this event may occur at any time, such preparation should

be constant and unremitting. Therefore, if we cannot point out the required constant and unceasing preparation for a future conscious state of existence, the fact of such existence becomes involved in doubt, and cannot be scientifically admitted.

It is within our knowledge, as heretofore stated, that the recognized manifestations of sensible light, color, and sound, which are developed to the consciousness of the governing member, do not exist externally of the organism, but are simply original fabrications, produced entirely within the limits of the governing and promoting members, through the mechanical effect of the physical undulations that occur directly between the external objects and the organs of sense. It is also within our knowledge that these physical undulations are being constantly employed, during the entire conscious existence of the animal organism, in the fabricative acquisition of sense-representing factors, from which sense-symbols adapted for the production of inverse consciousness in the governing member may be fabricated. Hence, the first mentioned requirement of an incessant constructive preparation for the inevitable mortal metamorphosis may, in the constant and unceasing fabrication of such factors, be fully complied with.

But we have also to apply the test of prior limited exercise, in this life, of those special functions that will be required in their full perfection in another state of existence from which the present objects of sense and the peripheral organic enginery of sensation and motion are wholly separated. And in this re-

spect, also, we are able to point out the required preparatory exercise for a coming metamorphosis, in the universally occurring phenomenon of dreams, in which the fabricated sense-symbols are often presented to the consciousness of the governing member with practically the full vividness of light, color, and sound, and with all the minuteness of mechanical detail pertaining to the material objects from which they were originally derived. Hence we may reasonably conclude that in the objective world, the animal organism is constantly engaged in the individual fabrication and accumulation of sensive sense-representing factors; and that, in the subjective dream world, the promoting and governing members of the organism are being together exercised—under present imperfect conditions—in preparation for their proper conjoint action during the mortal metamorphosis.

It is well known that consciousness in the animal organism is dependent upon a full supply of blood to the brain; and that, if the proper flow of blood is interfered with, consciousness ceases. How then can it be reasonably presumed that conscious memory can exist upon the removal of the sanguineous elements of the organic enginery, upon which consciousness at present absolutely depends?

In reply to this question it may be stated that, in the transformation of an animal from one life condition to another, we have in nature examples of both immediate and prolonged metamorphosis. An immediate metamorphosis occurs, when the transformation removes the organism at once entirely from its prior

life condition. A prolonged metamorphosis occurs when a stage intervenes, in which the organism is but partially removed from its prior state, and for a time makes additional preparation for a subsequent completion of the metamorphosis. In the case of the higher animal organisms, the transformation effected by the separation of the governing and promoting members from their organic engineries constitutes a prolonged, and not an immediate metamorphosis, since the governing member is to be actuated to consciousness through the action of the reversely presented sense-images, which are related entirely to objects of the present life and environment. Therefore, it is only upon the completion of a subsequent fabrication, which must be effected through the action of the ever-conscious promoting member, that a complete metamorphosis will be established. Furthermore, in every case of prolonged organic metamorphosis, the tissues of a previously employed structure,—now of no further use or benefit, are caused to disintegrate and become dissolved into their original discrete elements, in order to provide suitable material for the fabrication of a new and distinct structure for the completion of the metamorphosis. Hence it will be clearly seen that the analogous disintegration of certain structures which were originally fabricated from the sensive cell-elements of the organism, and usefully employed by the governing and promoting members during their conjoint connection with the organic enginery, and which are now of no further use, may provide the same discrete elements as before, for the for-

mation of new fabrics of memory in which occurring states of sensive, emotive and co-ordinative consciousness may be recorded, without requiring the acquisition of original material from a continued circulation of blood.

In the pupal metamorphosis of certain species of insects, where very extensive changes of structure are to be effected, the necessary disintegration of those tissues which are no longer required is due to the activity of the independent blood corpuscles, or leucocytes, which pertain to the vascular system of the insect organism, and, therefore, to the field of the promoting member, the disused larval organs being broken up by the leucocytes and disintegrated, to form the requisite building material for the succeeding more elaborate structure. And in this case, the disintegration of the larval tissues is not to be attributed to the previous death of the cells, but is the result of the independent action of the leucocytes on tissues which, although weakened in their vital power, are still living; so that, while the most active larval tissues are enabled to withstand the attacks of the leucocytes, the less active are divided by them into fragments and reduced to their discrete elementary condition, in order to provide proper material for subsequent constructive fabrication. So likewise, in the transformation of the tadpole into an adult frog the disintegration of the living tissues of its tail for the fabrication therefrom of the required new structure is solely effected by the action of the leucocytes. And such disintegration of tissues by independent organisms is common

in animal metamorphosis—the leucocytes themselves finally becoming incorporated as permanent integral elements in the tissues of the new organization.

We further find in animal metamorphosis, that not only the material tissues of the organic enginery are disintegrated and transformed into other tissues by the action of the promoting member, but the controlling instinct of the organism which embraces the immaterial sensive and emotive factors, is also changed and modified, in order to adapt the animal to its required new life condition.

Hence we may posit that it is a fundamental law of animal transformation, from one life condition to another by prolonged metamorphosis, that some of the parts of the organism which had a function in the prior life condition must be broken up and dissolved, to provide the required material for the development of the new organs, and that, where extensive changes of organization are required to complete the transformation, the necessary dissolution of the unused parts is to be effected by the action of certain independent sensible agencies, which pertain to the field of the promoting member. And these changes are to be effected in the immaterial, as well as the material elements of the organism.

We may now be asked to point out in the human mortal metamorphosis the necessary independent sensive agencies that are capable of effecting the required extensive changes in the organization for the full completion of its transformation in the line of its predominant attributes, either of beneficence or maleficence.

We often find in the field of dreams certain true representations of conscious individual intelligences, which present to the inverse consciousness of the governing member all the characteristics of objective reality and intelligent action, that pertained to those individuals of the terrestrial factory, in connection with which, the emotive factors of the governing member were originally developed and exercised. And by means of such intelligently acting individual representations, the promoting member has the power to present for the contemplation and action of the governing member, such scenes and incidents, as will favor the continued growth of the stronger emotive-factors, with a corresponding reduction of the weaker. Hence we may posit that if, at the initiation of the mortal metamorphosis, the tendency of the stronger emotive factors of the governing member is toward the dispensation of energy for maleficent selfish fabrication, then the elements of its weaker emotive factors which pertain to beneficent fabrication, must necessarily be reduced and fabricatively appropriated, in order to provide the requisite immaterial elements for the promotion of the stronger emotive factors of maleficence, and *vice versa,* the required reductive changes and appropriation of elements for the proper completion of the metamorphosis, being necessarily effected in the line of least resistance. So that the governing member, will, by the inevetable suppression of its weaker emotive factors during the progress of its mortal metamorphosis, be rendered either positively maleficent or positively beneficent in its impulses and gov-

erning actions, and be thereby fitted either for the righteous field of the beneficent Supreme Governor, or for the opposite reactive field of the maleficent Adverse Medium.

It is evident that if, in the case of one individual, the promoting member is constrained by the intrinsic character of the governing member, to derive its transforming power from an energy which pertains to the active field of the Supreme Governor, and in the case of another individual from an energy which pertains to the reactive field of the Adverse Medium —then the engineries provided for the objective action of these individuals at the completion of their transformations, will be attuned to their respective transforming fields of energy, whereby the world which is adapted for the conscious action of the one transformed individual, will be separate and distinct from that of the other.