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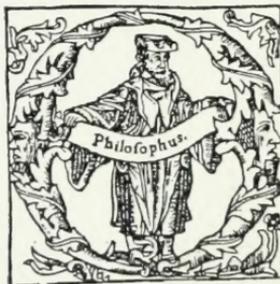
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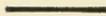
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PHILOSOPHICAL PROBLEMS

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PART I
PHILOSOPHICAL SURVEY

PHILOSOPHICAL PROBLEMS

I. INTRODUCTION

PONDERING philosophical questions from the standpoint of natural science, the present writer has during a lifetime of research become convinced that some of the principal standing problems which have vexed ancient and modern thinkers may find their more or less complete solution by having recourse in their interpretation to facts of vital organization.

What is consciously realized as nature takes, undeniably, place in living beings, as an outcome of their peculiar constitution and its inherent faculties. It seems, therefore, *prima facie* probable that the direct way to gain a proximate understanding of what is thus consciously revealed as nature is to show by what means of vital organization and functional activity such conscious revelation becomes possible.

It has lately been rendered obvious, even to naturalistic thinkers, that what we consciously experience as nature cannot be the mere outcome of atomic mechanics, that the materialistic and mechanical hypotheses are incompetent to account for all that takes place in nature; incompetent, in truth, adequately to account for any natural occurrence, whether physical or psychical.

On the strength of this widely acknowledged insufficiency of the materialistic hypothesis, disclosed by

natural science itself, scientists have on their side substituted for the assumption of material atoms that of sensorial atoms, or that of other kinds of physical units. While, on their side, conceptual thinkers have not failed to renew their dialectic onslaughts against all manner of Naturalism. They still persist in trying to show that what is intuitively believed to be the external world has no self-subsisting reality; that, on close examination, it altogether dissolves into pure ideal consistency. They profess to have positively disproved as wholly irrational the common-sense conviction that perceptible nature exists independently of being perceived. And they are confident of having established as final truth that what is called nature is, all in all, a psychical manifestation, or a mere product or outcome of absolute Reason or Spirit. Something like neo-Platonism has thus once more become the creed of many leading philosophers, as has repeatedly been the case after periods of materialistic or sensualistic interpretations.

From the vantage ground of our present science it is, however, not difficult to show that pure Idealism of whatever kind is incapable of making sense out of mere ideal facts of experience; incapable of giving a rationally consistent account of natural phenomena without surreptitiously introducing naturalistic implications in its world-construction or world-interpretation. The content of our conscious experience is found to yield in itself no rational meaning whatever. It gains such solely through its implied reference to a realm of extra-conscious, genuinely naturalistic existents. This rather dogmatically sounding assertion will be amply justified in the course of this treatise.

The reason why pure Idealism has nevertheless at

times gained philosophical ascendancy, and that Naturalism has so persistently resisted consistent philosophical formulation, has been chiefly due to the incompetency of the materialistic hypothesis. It will be found quite otherwise when Naturalism is no longer based on atomic mechanics, or on aggregated units of any sort, but on an epistemological interpretation of biological occurrences taking place in unitary organic beings. On such a foundation the attempt shall here be made to prove that Idealism is utterly impotent to account for reality, and that Naturalism, on the contrary, affords a rational and consistent interpretation of actual experience, and therewith of nature itself.

Until recently mathematical and mechanical conceptions have dominated not only natural science, but also philosophical speculation. The origin, motion, change, order, and concatenation of that which appears in time and space, as therein perceived and conceived, has most readily offered itself as subject matter for philosophical interpretation, and it lay near to attempt such interpretation in immediate and essential relation to the media in which the appearances arise. That which appears was thus considered to have its real being, and to suffer its real changes in time and space; or to be special determinations of these all-including media, such as motion, rest, and number, or succession, coexistence, and quantity.

Now, as everything experienced in nature is found to be subject to change, and is, moreover, involved in the perpetual flux of time; and as amid all this perceptible change and evanescence something nevertheless permanently abides, something which by dint of its apprehended continuity and identity imparts signifi-

cance to the transitory manifold, it lay in the course of thought that the principal philosophical endeavor was directed towards detecting the real nature and meaning of such permanent identical entity.

What, then, can be the real nature of the permanent existent that amid all change and transitoriness identically abides? With the solution of this central riddle philosophy has mainly busied itself.

Surveying the problems that in the search after true and abiding reality have occupied philosophical thinkers, ancient and modern, what perplexing array of yet unyielding puzzles have time and space, with their shifting content, presented to the ingenuity of man for rational solution:— being and becoming; the one and the many; the immutable and the flowing; the permanent, unitary, substance, subject, or substratum and its divers attributes, accidents, properties, or modes; the moving or actuating power or force and that which is moved or actuated; the universal and the particulars; uniform spatial extension and its figured determinations or limitations; all-containing consciousness and the meaning of its revelations; mental and material or psychical and physical modes of appearance and their mutual relation and dependence; the supremacy either of intellect or of sense, of reason or of will, of quality or of quantity, of mechanism or of teleology; the significance of normative thought as set against contingent experience.

These are some of the foremost, as yet more or less disconnected and unsolved problems, whose attempted elucidation has made up, and is still making up, the history of our philosophical effort to interpret what we experience as nature.

Among ancient thinkers mathematical conceptions

have sometimes consciously, sometimes unconsciously, done essential service in philosophical interpretation. In modern times mathematical and mechanical principles and methods have intentionally and conspicuously guided the thought of most leading philosophers. Galileo laid the foundation of scientific mechanics by demonstrating the accelerating effect of forces upon bodies, which involved the "law of inertia," expressive of the intrinsic import of "mass" in the motion of bodies. Gassendi revived Epicurean atomics, and before long the reduction of all physical, indeed of all natural occurrences, to atomic mechanics became the generally acknowledged aim of exact science. And among biologists, as well as physicists, the reduction of natural occurrences to measurable quantities, expressible in mathematical equations, remains still the end aimed at.

Descartes believed in an out and out mechanical construction and operation of extended nature, organic structures and functions included. Hobbes attributed supreme reality to extension and motion mechanically actuated, and held methods of mathematical computation to be strictly applicable to philosophical problems. Spinoza sought to evolve the content of his absolute substance in accordance with Euclidean methods. The principal philosophical aim of Leibnitz was to harmonize the mechanical interpretation of extended nature with the manifestations of unextended thought.

Meanwhile, the experimental investigation of natural phenomena, fostered by the "Royal Society" determined Locke's and his followers' method of questioning "Human Understanding." And Newton's influence guided Kant not only in his physical but

also in his philosophical researches. He never relinquished his belief in the rigorous mechanism of nature, and mathematics gave him the clue to his "Critique of Pure Reason," which he based on the alleged discovery of the *a priori* synthetical nature of mathematical propositions. Natural occurrences were thus, in keeping with mathematical and mechanical principles, generally held to take place with absolute necessity; definite effects following rigorously and wholly upon definite causes.

Now it is evident that if the asserted mechanical constitution of nature, with its rigorous concatenation of equivalent causes and effects, which in the last instance become reduced to redistribution of material particles through imparted and received motion; if this prevalent view were really a true and adequate explanation of natural occurrences; nay, if it were merely conclusively proved to be true that whatever is seen to occur at a certain moment is the necessitated and fully effected outcome of that which had taken place the previous moment; then the inexorable consequence would be, that we are out and out only conscious automata, wholly involved in a fatalistic drift of physical becoming. It will be remembered that so eminent a scientist and thinker as Huxley has in our own time not hesitated emphatically to advocate the doctrine of "conscious automatism." And it is clear that the prevalent view known as psychophysical Parallelism leads consistently to no other conclusion. If such were the real state of things, all attempts at breaking through necessitarian entanglements by means of idealistic arguments would amount only to inept flights of fancy. It is indeed a fact that, not only students of physical phenomena, but also specu-

lative philosophers of the first order, have on the strength of this conception of rigorous causation promulgated fatalistic interpretations of nature. The doctrines of preordination, of determinism, of logical necessity, of conceptual evolution, imply, one and all, fatalistic conclusions.

The Cartesians were necessitarians on the psychical as well as on the physical side. Descartes himself taught that the Deity is the general and predetermining cause of all motion in nature. And as, according to his view, the thoughts of human beings are supernaturally made strictly to coincide with their necessitated movements, man can be nothing but a conscious automaton. Such Spinoza and Leibnitz, in so many words, actually declare him to be. With Malebranche God is the real source of all efficiency in nature, and this involves complete automatism of human thoughts and movements. Spinoza's absolute substance determines within itself its two attributes of thought and extension, and all their accidents and modes, with absolute necessity. In the monads of Leibnitz their perceptions and apperceptions arise fatalistically preordained.

Kant's elaborate effort to show how the mechanically necessitated order of nature is coerced from a supernatural sphere into paths of moral freedom, attempts something wholly irreconcilable. Necessity and freedom of whatever kind are radically exclusive of each other. What is mechanically necessitated in the phenomenal sphere cannot be freely actuated in noumenal regions. To transcend these antithetic notions of Kant, the outcome on one side of his theoretical, on the other of his practical reason, Fichte posited as supreme principle the exclusive autonomy

of the practical reason, declaring it to be an all-creating moral activity, which in its world-construction makes no use of external material. In his scheme of creation the notion of freedom runs riot. A mere unembodied activity, working upon no given material, creates *ad libitum* all existence out of nothing. Yet the unaccountable nemesis of a "moral law" is declared to drive it nevertheless fatalistically towards a preordained end or fulfilment.

Schelling sought to overcome the Kantian dualism of freedom and necessity by positing an absolute Reason as the unconscious and undifferentiated ground of thought and being, of subject and object, identifying it with all-creating will-power. In this pantheistic view, however, no less than in that of Spinoza, there is no room open for human self-determination. Hegel sought to account for the manifoldness of apparent particulars emanating from unitary Being by transforming Fichte's moral self-determination, and Schelling's volitional or conative Pantheism, into a pure cognitive Panlogism, wherein human experience consists only in a more and more complete *re-cognition* of the self-evolving notions of an absolute Reason or Spirit. Logical necessity, excluding as such free determination, is making here dialectically for "absolute Truth."

None of these ontological systems, despite ample professions of freedom, have really succeeded in overcoming the necessitarian or fatalistic view of existence, seemingly bound up with our way of thinking, whether contemplating the physical or the psychological aspect of nature. It can, nevertheless, be safely predicted, that thought will never relinquish the effort to find a valid way to break loose from the fatalistic

fetters. But it has to be admitted that, so long as the necessitarian contention of natural science cannot in its own field be proved to have been a mistaken interpretation, it will stand an impregnable bulwark against all attempts at philosophically justifying free human self-determination. The vast array of perceptible and always verifiable facts of physical nature can nowise be argued out of existence, or mentally dissolved into nonentity by any sort of idealistic dialectics. Whatever is asserted to the contrary, it is certain that no manner of thought has ever succeeded in assimilating into itself, and causing to vanish into its own invisibility and intangibility, the sense-revealed things of perceptible nature, or succeeded, vice versa, in evolving them out of ideal or conceptual latency.

Ethical conduct, which presupposes free self-determination, being a positive, incontestable fact, it is sure that, so long as there are scientists and thinkers, human existence will be probed until its true nature is laid bare, and self-determination, which constitutes the most characteristic and essential outcome of humanized life be scientifically and decisively explained as resulting from the specific vital constitution of human nature.

Adequate criticism fails to detect that, by following the bent of mathematical and mechanical principles, even the most illustrious interpreters of nature have made essential headway in answering the perennial questions that have formed the chief subject matter of ancient and modern philosophy. Nor have these questions been solved by such thinkers as have attempted to construct nature by aggregation or combination of sensorial elements or of monadic units. Nor, on the other hand, have they been solved by such

Transcendentalists as have sought to evolve experienced existence from the intelligible or intuitive apprehension of the nature of an all-comprising Absolute, or from some dialectic system of conceptual evolution. In fact, the results attained sufficiently show that no method hitherto adopted has sufficed to afford an explanation of the problems in question. The consequence is that physical and psychical science in their most advanced state have come to reduce all natural manifestations to fleeting phenomena, arising and vanishing as mere appearances in time and space. Extreme Phenomenalism, even more extreme than that of Protagoras or of Hume, with no demonstrable reality underlying it, is undeniably the present consistent outcome of physics and psychics.

To evade such pure Nihilism speculative thinkers postulate, as underlying and actuating the fleeting phenomena, either universal Reason or universal Will or universal Energy, or some other substantialized and eternalized agency. This, however, is merely to give way to the inveterate tendency of elevating into permanent and efficient entities concepts generalized from selected groups of experienced phenomena; selected, in fact, from out the complex of phenomena which constitutes our unitary moment of actual awareness.

The power or powers that actuate the phenomenal play of appearances, and the abiding matrix whence they issue into manifest existence, these permanent agencies can certainly not themselves be found in any of the transitory and evanescent manifestations, not in any of the fleeting modes of conscious awareness. And these modes of conscious awareness are obviously all we directly experience. Nor, on the other hand,

can the assumption and hypothetical manipulation of a multiplicity of suprasensible entities, such as the atoms of Democritus and of the modern physicists, or the monads of Bruno, Leibnitz, and others, be made in any way to account for the phenomena arising and dwindling within our all-revealing conscious content. Consciousness is psychically all-inclusive, physically all-exclusive. It is in every conscious being truly monadic and solipsistic. It has no "windows" that can admit the intrusion of outside existents, nor can its unitary manifestation result from any aggregation and agitation of assumed inert particles of matter, or from the conjoint activity of any kind of grouped elements.

No doubt, the phenomenal appearances which make up our conscious content must issue from some abiding matrix. They cannot arise out of nothingness. And their conceptual ordering, with its involuted logical comprising of what on former occasions had been successively and fractionally apprehended, must rest somewhere and somehow potentially established in latency. And it is manifestly this latently and potentially ordered, consolidated, and unified epitome of experienced facts which, as occasion arises, becomes actual so as to form our conscious content. It constitutes thus an extra-consciously established matrix or groundwork for analytical judgments, and receives, sifts, and subsumes random sensorial material into preformed classes and orders.

No candid thinker can, however, on the strength of such conceptual experience maintain that the hidden seat of the conceptual ordering, the place where it abides in latency when not casually called into conscious play; that this secret abode of conceptual forms,

and their implied experiential content, has yet been ascertained with any degree of certainty. We possess somehow a preëstablished organization endowed with various modes of being affected, and we somehow have power to discern differences and agreements between these affections, their blending, and their manifold relations. This enables us to subsume their apprehended similarities under concepts or universals, or rather to recognize the special preorganized classes or molds into which they naturally fall. These organized molds with the particulars they implicitly comprise are, when functionally actuated, revealed, and recognized within the conscious content as a more or less complete system of remembered experience which, besides its practical value, lends itself to analytical judgments and dialectic evolutions in elucidation of the experientially accrued knowledge.

But what warrant is there in all this to give to the hidden matrix of the latently systematized experience the name of "Reason" or "Intelligence" or "Spirit," as transcendental Idealists are wont to do; meaning thereby an all-efficient potency that creatively manifests or implicitly contains the entire content of eternal Reality, which totality of Being each of us only fragmentarily and inadequately apprehends or recognizes? Surely such hypostatic assumption is altogether arbitrary and fantastic, and does not even hypothetically account for the given facts.

On the other hand, just as little can that, which is perceived as the organic body with its complex morphological constitution, be rightly held to be the veritable matrix that potentially harbors the conscious content with its systematized experience. There can obtain no causal relation or efficient connection of any kind

between consciousness, actual or potential, and that which is perceived as brain-structure and its functional modes of motion. We have, then, to confess that the real seat and matrix of our potentially memorized and systematized experience; the seat, in fact, of our entire conscious life remains as yet philosophically and scientifically unintelligible and enigmatic, although what is perceptually revealed as brain-structure has been scientifically proved somehow potentially and functionally to underly memorized and actual experience.

The recognition of organic evolution has lately commenced to throw light on fundamental problems which philosophical speculation has left in the dark. But unaided by a correct epistemology this new light has no power to penetrate beyond phenomenal appearances, beyond that which appears as conscious content. And, despite endless efforts, no attempt to formulate a theory of knowledge has yet succeeded in legitimately breaking through the charmed circle of individual consciousness. Imprisoned in this solipsistic realm of transient appearances, philosophy has vainly labored to attribute steadfast realistic efficiency either to sense or to intellect, either to perceptual or conceptual modes of awareness. Nor is it more successful in seeking to enthrone as all-efficient potency the volitional activity we casually and transiently experience as consciously revealed. No intuitional Ontology, howsoever consummate and sublime, no science, howsoever exact and penetrating, can legitimately supersede or supplant the grounding of our interpretation of nature upon a valid epistemology. The lack of it lies at the root of most philosophical contention.

By critically examining some of the most essential

attempts at a speculative interpretation of natural occurrences, it will appear how impossible it is to answer the principal philosophical questions without a positive recognition of the real epistemological import, and the actual realistic bearings, of the conscious revelation, which is the only medium of all our experience and knowledge.

II. SOME FUNDAMENTAL PROBLEMS AWAITING SOLUTION

(I) SUBSTANTIALITY

OF all philosophical problems that of substantiality is paramount. It may rightly be held that philosophy has centered in the attempt to disclose the nature of the entity that substantially abides amid a world of changing appearances, of which it is the emanating or manifesting source. With the first systematic efforts to discover the permanent entity which seemingly emits or transforms itself into the shifting and changing things that make up the perceptible world, or which underlies and actuates the same; with these primitive efforts at philosophizing the ever vexed problem of Being and Becoming sprang into prominence, henceforth to become a prolific propagator of all manner of hypothetical systems.

To early thinkers it lay near to attribute life to everything that moves and changes, or seems to be the bearer of motion and change. The universe appeared to them to be throughout an animated Being. But what kind of Being? This question was ever for human thought the supreme puzzle, and has remained so up to the present day.

The ancient sages ascribed substantiality or real Being to that which fills space. But that which fills space is constantly changing. It soon became obvious that what has to be considered permanent cannot possibly have its abiding essence in that which is changing

and transitory, not in the multiplicity of appearing and disappearing formations. Abstracting, then, from the changeful manifold of sense the Eleatics conceived permanent Being to be ever one and the same abiding homogeneous substance, immutable and unchangeable. The changeful things of the sense-apparent world they declared with consistent boldness to be illusive phantoms belonging to a realm of unreal existence, which sense-depreciating view is still shared by our transcendental Idealists. In order to clear real Being, as eternally identical, of all diversity and transitoriness, the perceptible becoming of things is simply pronounced to be a delusion of sense. For no bidding-place for substantial permanency of Being can be found amid nothing but changeful sense-phenomena. Real Being was believed by the Eleatics to consist of outspread cosmic matter, held to be throughout endowed with psychical animation. This view also, taking the cosmic ether as all-efficient substance, has been adopted by prominent modern thinkers.

Human thought feels strongly urged to unify the manifold of experience under a general point of view. Under this stress it finds itself constrained to conceive as permanent source of all existence some kind of eternal, unchangeable Being of Substance. While surveying nature from this unifying point of view, the visible, tangible, space-filling cosmic matter was readily taken by ancients and moderns to constitute the perduring substance, undergoing protean changes without losing its own identity. But it was eventually recognized, more or less clearly by some ancient thinkers, and quite positively by some modern philosophers, that the properties, seemingly belonging to what is called "matter," are in verity only sensorial affections

of the perceiving subject, illusively projected as properties or qualities of an external material world. Psychically despoiled of all its sensible qualities, there remained nothing left to constitute real matter. It became wholly dissolved into insubstantial phenomena.

But before philosophical contemplation arrived at this outright denial of the existence of matter, the original immutable, homogeneous substance of the Eleatics was hypothetically broken up into a multiplicity of sundry kinds of discrete particles. This in order to account for the undeniable motions and changes occurring in nature. Change was thus explained as a moving or shifting of these particles. At first, not only modes of motion of like elements, but also diverse qualitative mixtures of heterogeneous elements, were made to account for the different appearances under which bodily formations present themselves. Later, however, motion alone, imparted to equal material elements, was deemed, by dint of unequal distribution, sufficient to produce all inequalities of shape and all qualitative differences in nature. The logic of the atomic theory forced modern physicists to conceive the ultimate particles of matter as equal, inert, indestructible, and qualitatively indifferent atomic beings, to whose externally imparted modes of motion and peculiar spatial arrangement, all differences in nature are then due.

There remained, however, in the background, unaccounted for, the primordial moving power that originally set going this mechanically necessitated scheme of material particles in motion, in which all that has subsequently happened in the world must then have been rigorously preconcerted. In the light of rational criticism the material substantiality of

the assumed ultimate particles was eventually found to be untenable. For changeless units, whose indivisibility and intrinsic simplicity logically exclude their extension, are — if still conceived as space-controlling — reduced to mere centers of force-irradiation, such as conceived by Boscowich, Faraday, and others. The material theory failed, furthermore, to render intelligible how mere matter and motion, themselves devoid of qualitative distinctions, can nevertheless give rise to such. And it remained still less intelligible how material particles, however moved and aggregated, can in any manner evolve or emanate modes of consciousness. Quality and consciousness refuse to result from mere quantitative differences of whatever constitutes real existence.

Recently the actuating principle in nature has been declared to be "energy" instead of "motion." Energy was at first, and is still generally conceived as the real change-producing agent, which — indestructible as matter itself — assumes all manner of qualitative guises by slipping from one body into another. It is said to be thereby equivalently transformed into different qualitative modes of appearance. Prominent thinkers have even asserted that our modes of consciousness are transmuted modes of this all-efficient entity. Energy is, however, at bottom only inferred motive power conceived as an effect-producing efficiency, hypothetically endowed with all manner of qualitative potentiality. The specific energy of friction, for instance, whilst at work under certain conditions among material particles, is held to be converted into the specific or qualitatively different effect called "heat," or into that called "electricity." But heat and electricity are physically declared to be essentially

definite modes of motion. As motion is, however, carrying with it no qualitative distinctions, it is evident that here again, despite appearances to the contrary, the true nature of quality has evaded scientific explanation. The qualitative potencies attributed to energy cannot be the outcome of a world made up of material particles actuated by motion. Physical science succeeds only in establishing the quantitative, mechanical equivalence of interdependent changes in perceptible occurrences. It throws no light on the qualitative aspect of changes.

The part attributed to motion or energy in physical science, as indestructible active principles, stamps them as substantial entities, such as J. R. Mayer conceived his energy-force to be. But a motion or energy, as such, detached from that which moves or changes is really an unthinkable fiction, something that cannot be conceived as a self-subsisting substantial entity. Substantiality, then, can neither rightly be attributed to matter nor to motion nor to energy.

Along with the attempt at an out and out physical explanation of nature, psychical principles of interpretation gained more and more sway. The all-revealing part played by consciousness could not long be altogether overlooked. Perception was too obviously a psychical, subjective function to be wholly confounded with physical modes of existence. And although perception was still believed by Protagoras, and also by Plato, to be itself the result of motion, yet its self-sufficient subjectivity, as exclusively our conscious experience, was already maintained by some Sophists. And with them, as with us in modern times, such subjective, sensualistic Idealism led consistently to pure Phenomenalism, Scepticism, and

Nihilism. For nothing substantially abiding can be discovered in the transitory play of sensorial and perceptual phenomena.

Meanwhile, however, the nature of conception, in contrast to that of perception, became more discriminatively defined. And soon the superior value and reality of conceptual over perceptual apprehension was firmly maintained, and remained henceforth a leading topic of philosophical discussion. Concepts were declared to be the real enduring entities in the world, the abiding archetypes, or comprehensive universals, of which all other modes of existence are mere perishing copies or particulars. And conceptual comprehension, culminating in an all-comprising, perfect system of self-sufficient thought, was consequently believed to constitute sole eternal and universal Reality, or absolute Being or Substance.

But the concept, as a universal entity, in order to comprise within its specific grasp an increasing number of particulars, has — as generally acknowledged — to drop more and more of its distinguishing traits, retaining only general similarities as its actual content. The highest, all-comprehensive concept at last reached, that namely of universal Being, has in order to comprise what is common to all particulars to cast off all their distinctions. It becomes thus the "All" which is identical with the "Nothing." As such it was conceived in the formless, unconscious, inactive "One" of Plotinus, in "das stille Nichts" of Boehme, in the "Ungrund" of Schelling, in the "Being-Not-being" of Hegel.

It is, in fact, only by surreptitious reinstatement, by help of memory of the discarded distinctions, that the concept or universal can be made to contain the

entire wealth of properties or qualities belonging to the comprised particulars. Moreover, even granted, as some thinkers maintain, that concepts really contain implicitly the entire content of their comprehended particulars; that there really exists a transcendent Absolute that comprises actually or potentially the complete system of conceptual thought or ideas; even granting all this, no visible or tangible things, no extended existents, no genuine emotions, no efficient volitions, can be at all extracted or evolved therefrom. Neither Plotinus nor Spinoza, neither Scotus Erigena nor Schelling, neither Leibnitz nor Hegel, have in their various attempts in the remotest degree succeeded in showing how the world of direct, actual experience can in any way be evolved from an ideally constituted Absolute, or, indeed, from any kind of ideally conceived substance. Nothing of a purely ideal nature, nothing merely thought-woven can be the permanent, substantial matrix of our all-revealing conscious content, and much less can it constitute the real universe which that conscious content reveals.

Nor can it be rendered rationally and ethically intelligible how an absolute Being can ever come to dissipate its eternal, all-sufficient perfection, in order to give rise to a succession of deficient perishing things and events.

On the other hand, to discard altogether the assumption of some kind of substantial and permanent Being as the source of the perpetual flux of things, nay to deny the existence of anything substantial underlying the transient appearances of phenomenal existence, as was objectively the teaching of Heraclitus, and subjectively that of Fichte; this amounts, in truth, to assuming a creation of all things out of nothing. A

pure self-subsisting activity, conceived as the generating agent of the becoming things or phenomena, call it force, motion, energy, *actus purus*, reason, entelechy, productive imagination, Ego, or what not; such pure creative activity is itself a nonentity evolving everything out of an unsubstantial void.

Production or creation out of nothing is unthinkable, and its assumption wholly irrational. Here, as in all excogitated world-constructions, it is our own conscious content with all its wealth of memorized experience that is really serving as inexhaustible, ready-made building material. But our all-revealing conscious content, an out and out appearance in time, participates necessarily in its perpetual flux. And some kind of activity must evidently give rise to this process of continual becoming. But activity rationally presupposes a permanent, substantial agent as the real bearer and actuator of the phenomenal play. Leibnitz, for this reason, introduced the notion of "psychical force," as the real actuating agent, and declared it to be the only veritable substance in existence, opposing it to the two substances of the Cartesians, and to the absolute substance of Spinoza. But our entire psychical experience, accruing to us as an out and out temporal phenomenon, is consequently forceless and evanescent, and none of its manifestations can therefore be rightly installed as substantial force or forceful substance. Fichte, unlike Leibnitz, was an outspoken Non-substantialist, eager to derive all becoming as creation or *actus purus* of an absolutely free and ungrounded activity, having nothing substantial underlying it. In doing so he hypostasized a beingless abstraction as world creator.

The proximate, all-important question here to be

decided is: Whence arises our all-revealing conscious content? Neither Leibnitz nor Fichte have in the least succeeded in answering it. Spinoza's notion of substance is conceived in analogy to geometrical conceptions. Geometrical space may be speculatively regarded as potentially comprising all possible forms that can at all appear within it. Such specialized forms, when they actually take shape are then in truth limiting determinations, introducing a specializing negation into the original undifferentiated all-comprehensiveness of space. And as regards the mutual relations of the specialized forms, they limit and thereby influence and implicate one another's being. An analogical view guides Spinoza's conception of absolute substance and its attributes and modes. Spinoza's substance may be likened to pure white light, which potentially comprises all colors in homogeneous unity. In the same manner does he conceive the absolute substance to comprise within its all-comprehensive perfection every possible attribute, and these in their turn every possible accident or mode compatible with their specialized nature.

All this granted, though it is entirely imaginary, whence, it must be asked, the activity, the power that shapes the definite forms, that breaks the single white radiance into variegated multiplicity; that segregates from homogeneous all-comprehension the special attributes of "thought" and "extension," which are held to constitute our own world? In fine, whence the perpetual flux of perishing things that taints the eternal perfection of All-Being? To this essential question no answer can be found in Spinoza's philosophy. And, indeed, no rational answer to it can be extracted from any absolutistic Ontology. An absolute, all-compris-

ing, divine substance refuses rationally to tear its perfection to tatters. If it does so "irrationally," as Schelling maintains, it then becomes guilty of all the pitiful insufficiency that, then, follows from so degrading an action. Schopenhauer's Pessimism is the consistent outcome of such a conception.

Spinoza's substance is conceived as an eternally undifferentiated, changeless totality of existence. No efficient or final causation is here allowed to give rise to the manifold of experience, no force or agency to actuate changes in its diverse appearances. For there can be no becoming where all is timeless and coexisting. Spinoza's fundamental error lies in his confounding and identifying "reason" with "cause." "*Ratio sen Causa*" is the magic formula he employs to summon definite activities and forms from out his eternally formless and quiescent substance. What is called a "reason" is rightly conceived as containing implicitly "consequents" already comprehended under it; but it cannot itself moreover cause these consequents. A cause is followed by a new-production of effects, while a reason contains its consequents as potentially present. Logical evolution and geometrical coexistence are principles utterly incommensurable with natural becoming. They are impotent to bring into sensible existence anything that is directly and actually experienced. And it is exclusively with the principle of reason and consequent, and with geometrical relations, that Spinoza attempts to account for what actually occurs in nature. By endowing his substance with the attribute of extension, as well as with that of thought, he complicates still more the insurmountable difficulty of speculatively deriving multiplicity from unity, and change from changelessness. This is more

plausibly effected in systems where thought alone is attributed to universal Being. The implicit content of what is called "thought" or "idea" may seemingly be made to evolve with logical necessity. The content of extension, being subject to geometrical necessity, admits of no such evolution. In extension everything is simultaneous. And Spinoza aims to explain the entire content of nature, conceived as absolute substance, mainly in accordance with geometrical principles.

The ancient problem of speculatively deriving the "Many" from the "One," so admirably discussed in Plato's *Parmenides*, offers difficulties nowise overcome in Spinoza's system. He can give no valid reason why the one absolute substance, the *ens realissimum* and *perfectissimum*, should at all come to differentiate or determine itself; and still less why, containing infinite possibilities, it should determine itself in definite eternal ways, such as thought and extension are held to be. Spinoza, when forced to face this fundamental question, has recourse -- as seen in his correspondence -- to the inconsistent device of making the definite attributes result from the peculiar limitations of the apprehending intellect, which views the absolute substance under special determinate aspects. But "intellect" being in Spinoza's system a manifestation of the attribute "thought" cannot possibly be its determining cause. And as to the attribute "extension," even allowing it, with all its modes, to have been somehow differentiated within the absolute substance, its timeless, changeless, forceless geometrical forms, could nowise resemble the visible and tangible moving, changing things we are cognizant of. These real things, unlike mere geometrical figures, are replete with intrinsic properties; nay, they are altogether constituted by the

potencies which give rise to these properties. Spinoza's substance fails in sundry essential ways to account for actual experience, and to constitute the veritable matrix of natural occurrences.

Kant's transcendental way of reaching the concept of substance is highly interesting for our purpose. He recognizes the perpetual flux of all appearances within time, or the "inner sense." According to his view, the ever-flowing successive moments of time are, however, apprehended as being moments of one single, all-comprising, all-connecting time. But time itself cannot be perceived. It is apprehended by means of its sensible content. This content is continually changing, and as nothing can arise from nothing, nor revert into nothing, something permanent must underlie the fleeting and changing manifestations. They must, consequently, be modes of appearance of a perduring substance. This inferred substance Kant is led to identify with indestructible matter, which he conceives to be the permanent substratum of all extended appearances. These material appearances are, however, with Kant nothing outside perception, nowise, therefore, things-in-themselves. They have their being in our own *a priori* form of extended perception, called space.

But everything appearing within space and time would remain chaotic, unapprehended, and unappereived, unless the random material of sense were taken up as it flows along, bit by bit, and thereupon synthetically grasped and unified, to be finally out and out transformed into an intellectualized system of objective nature. This rational collective fashioning of objective universal nature out of incoherent, subjective sense-material is brought about, according to

Kant, by the combining and unifying functions of pure reason, which reason itself has its root in the "intelligible Ego," as manifest in the "synthetical unity of apperception." The true nature of this "intelligible Ego," which with Kant constitutes our real transphenomenal or noumenal Being, is nowise revealed in any of the appearances in time and space. It subsists beyond time and space as the veritable bearer and actuator of both our sense perception and our intellectual apperception. Matter, the substance of sensible appearances, Kant designates as "substantia phenomenon," the timeless, spaceless, intelligible Ego as "substantia noumenon."

The all-important epistemological fallacy in Kant's elaborate and profound derivation of "substance" is to be found in the attribution of objectifying, universalizing power to the synthetic functions of pure reason. No valid justification can be here advanced why the substance inferred to be the permanent substratum of our individual, and therefore subjective spatial perceptions, should acquire objective universal reality by being brought under the sway of the substantializing function of pure reason. Why should the substance individually inferred as underlying my subjective spatial perceptions become objectified and universalized into the identical matter or substance recognized by each of the sundry individual consciousnesses?

The essential problem of epistemology is no other than to show how individual consciousness can be legitimately transcended; how it happens to yield universally valid knowledge, knowledge shared by the rational consciousness of all other human beings. This paramount epistemological task has never yet

been rightly accomplished. No thinker has yet succeeded in finding a legitimate way out of the phenomenal solipsism of individual consciousness into the realm of universal existence. The common rational experience of all human beings must certainly have a common source of information. Where, then, is this common source to be found?

It is an entirely arbitrary procedure to endow the individual being with universally valid reason, with reason capable of producing universally valid nature. This wholly ungrounded assumption ignores completely the ineluctable epistemological problem. It virtually deifies the individual by attributing to him all but omnipotent creative power. For as the universally valid conception of real substance, indeed the construction of nature in general, is with Kant, an outcome of each individual's sense-perception intellectualized, and as sense and intellect are held to be grounded in their intelligible Ego, the consciousness of each Ego must then, in order to be universally valid, be identical with the consciousnesses of all other Egos, must be what Kant actually names it: "consciousness in general," "Bewusstsein überhaupt." And this could be the case only if all intelligible Egos formed equally part of a universal Ego, which would then be the veritable creator of the universally valid content of "consciousness in general." The consistent outcome of the assumption of objectifying reason is, then, by no means the intended "transcendental Idealism," but pure absolute Idealism. This is really Kant's own view when he contemplates the world from the intelligible standpoint. He conceives, then, the intelligible Ego as really endowed with the power of free volitional causation; the power namely of initiating

all the actions of the sense-apparent individual. And he derives this power from a universal Will or Ego, the veritable creator and actuator of all natural appearances. This absolute Idealism, based on the assumption of the free productive volition of the universal Ego, was elaborately expounded by Fichte. And Schopenhauer made all-creating Will the foundation of his system.

Strange to say, the entire aim of Kant's critique of pure reason is, nevertheless, to controvert absolute Idealism. Not only in his much-discussed "Refutation of Idealism," but in numerous other passages, he emphatically denies the creative power of pure reason, and declares that no knowledge can be attained, unless sense-material be "given," or at least specifically aroused by outside influences emanating from the realm of things-in-themselves. And he rightly showed that the consciousness and apprehension of the permanency of our own being is dependent on the persistency of the influx of the foreign influence. He reasoned that, if sensorial material were not persistently given or aroused, our synthetizing reason, having no material to work upon, could not possibly construct anything permanent; nay, that our veritable being, our intelligible Ego, could, then, never become revealed as a permanent, substantial entity.

But even with all outspoken dislike of pure Idealism, and his seemingly valid refutation of it, and against the sum and substance of his critique, "*noumenorum non datur scientia*," Kant fails to escape the meshes of the idealistic net, in which his immediate followers complacently revelled. For that which he believed to affect our sensibilities from outside he held to emanate from the noumenal sphere, and this, with him, is the

same transphenomenal realm to which our intelligible Ego is declared to belong. But in the intelligible, noumenal sphere the Ego of all Egos is in Kant's system the veritable creator and actuator of all natural occurrences, indeed of all existence whatever. Consequently it must be this universal, noumenal Ego of the intelligible world that is here determining or affecting itself in definite ways. Here, however, not centrally, by force of free volitional causation, but sensorially and perceptually in the sphere of phenomenal and mechanical necessity. Now, as free causation, centrally initiated from out the noumenal sphere, strictly coincides in its phenomenal outcomes with necessitated causation, peripherically impressed from out the same noumenal sphere, absolute Idealism is again, despite protests to the contrary, consistently reached.¹

There can be no doubt that our all-revealing, yet

¹ Kant's attitude towards Idealism has always been a highly perplexing question, much discussed among German philosophers, and lately also among English-speaking thinkers. The present writer, in an early work published 1871, "Die Kant'sche Erkenntnisslehre widerlegt von Standpunkt der Empirie," asserted that Kant's philosophy is not really, as he himself professes, a "critical" or "transcendental" philosophy, but a metaphysical Ontology: "dass die Kant'sche Philosophie ihrem Grundprincip nach gar keine Transcendental-Philosophie ist, sondern eine metaphysische Ontologie," p. 172. And this because all that in the critique is seemingly taking place in the sphere of our empirical consciousness is in reality the work of the "transcendent" activity of the "intelligible Ego."

This view has found its complete justification since "the going back to Kant" has led to a searching examination of his writings by a host of eager investigators. It has been directly corroborated, besides, since the publication of Kant's posthumous work, "Uebergang von den metaphysischen Anfangsgründe der Naturwissenschaft zur Physic." His matured world conception, and therewith his final attitude towards Idealism, may be briefly formulated in the following terms: Within the outer spatial consciousness of our

ever-flowing conscious content presupposes a permanent substance, matrix, or Ego underlying and actuating it. But this can certainly not be found in what is called "matter" nor in what is called "intellect"; not in Kant's material substance of the phenomenal order, nor in anything belonging to his fancied realm of noumenal subsistence.

But even if the real substance underlying and actuating our all-revealing conscious content were truly discovered, there would still remain the all-important question, why our exclusively individual endowments of perception and conception are competent to yield universally valid knowledge, knowledge shared by all rational beings, and validly applicable to natural occurrences. No kind of pure Idealism has solved, or can ever solve, this fundamental epistemological problem.

empirical Ego we find the appearance of our own body, and also, occupying all other space, the appearance of the other bodies that constitute the universe outside our own body. These foreign *bodily appearances* affect the senses of our *bodily appearance*, giving rise thereby to the *inner* consciousness of our *empirical* Ego. All these occurrences, while taking place in the sphere of our *empirical* consciousness, are, however, in reality modes of the apperception of our *intelligible* Ego, which itself is forming part of the all-comprising intelligible world. Consequently, all phenomenal occurrence revealed as nature to our empirical consciousness is really created and actuated in the intelligible world.

At an earlier period, Kant held the extra-conscious things-in-themselves, and not the intra-conscious bodily appearances, to be affecting the senses. And he believed that by recognizing, in opposition to Leibnitz, a "mundus phenomenon," a world of sensible appearances, set against the "mundus noumenon or intelligibilis," he had overcome the latter's out and out intellectual Idealism, and therewith all pure Idealism. But it is clear that, by attributing all real efficiency to the noumenal or intelligible sphere he landed himself in the enticing realm of pure intellectual and volitional Idealism.

(2) IDENTITY

Closely connected with the problem of substanti-
ality is that other great unsolved riddle of identity in
nature. Without the practical reliability and theo-
retical conviction of the lasting subsistence of things
and thoughts amid the perpetual flux of time, and
during their absence from actual awareness, the con-
duct of life and that of rational thinking would
be impossible. But where and how do things and
thoughts really identically abide when not consciously
apprehended? And when present in consciousness,
how can they remain identical when each moment of
their presence lapses with time in which they flow into
the irrecoverable past to be no more? Heraclitus,
deeply impressed with the mutability of everything
in this world, seized upon the recurring order of
sequence amid the incessant change as the principle
of stability and identity, conceiving it as divinely
ordered "Fate," which he called "Reason."

The principle which in experience and knowledge is
held to impart consistent and steadfast meaning to
the changeful and fleeting phenomena of actual aware-
ness, has very generally been designated as "Reason."
Such reason must then be a permanent, transphenom-
enal agent actually engaged in the cognitive constitu-
tion of the universe. The Heraclitean view involved,
however, a preëstablished harmony between subjective
experience and objective nature, similar to that forced
upon Leibnitz, in order to make the wholly occluded
conscious experience of each of his nomads tally with
what is simultaneously occurring outside in the world
at large. For as thought with all its divinely fated
order is itself involved in the perpetual flux of time, its

sequence of reason-fated apprehension must have been, as such, not only preordained, but also by means of preëstablished harmony accurately timed to the sequence of the apprehended outside occurrences. This really means, what the Cartesians maintained, that such actual and constant coincidence of thought and being is the preëstablished result of a divine *fiat*. It need hardly be mentioned that this frequent device of calling in a *Deus ex machinâ* in this perennial dilemma of thought and being affords no philosophical explanation.

As to the theory of preëstablished harmony advanced by Leibnitz, it is really a useless incumbrance in his Monadology. His monads know nothing whatever of outside existence and order. Each monad recognizes without assistance from outside, in its own intrinsic series of evolving perceptions and apperceptions more or less distinctly and perfectly, the identical universal truth or reality implicitly imparted to it by the supreme "Monad" or "Deity." A monad is what Leibnitz himself calls it, a "spiritual automaton," apperceiving the perceptions that arise within itself with fatalistic necessity. The omniscient Deity alone, and evidently only by transcending his own monadic seclusion, could possibly know what was going on in other monads, and what kind of universe, if any, they were conjointly constituting. The truth is, moreover, that the intrinsic experience arising separately in each autonomous monad, if it could in some mysterious way be collectively combined; that such combination would not even then result in the formation of a coherent universe. And this not only because it is potentially exactly the same, and yet actually an entirely diverse world each monad is apperceiving or perceiving, but

also because the content of each monad, consisting of that of all other monads, no monad could have a special content of its own, and could therefore not supply other monads with any content. A plurality of wholly autonomous, wholly exclusive beings, cannot possibly compose any kind of universe or cosmos.

Here identity of any sort, metaphysical, logical, subjective, and objective, fails to receive philosophical or rational explanation. In a being whose whole existence consists of transient, successively fated evolution and apperception of eternal truth; in such a mutable, ever-evolving being nothing identical can subsist. And even if every succeeding apperception were to sum up all precedent perceptions and apperceptions, or evolve them in a comprehensive and distinct totality, the apperceiving monad, consisting of such successive apperception, cannot possibly remain an identical being while undergoing such constant change.

The Eleatic sages, on the contrary, in their search for what identically abides, eliminated from reality every mode of change, leaving only what they declared to be an ever-identical substance, eternally immutable and homogeneous throughout. And though they conceived it as psychically animated, they could consistently endow it only with changeless life and thought, and this, it need not be said, amounts to a complete negation to what essentially constitutes the nature of life and thought. In the same way an inactive, changeless substance, without qualitative and quantitative distinctions of content or manifestation, would be a complete negation of what essentially constitutes the nature of substantiality, which is necessarily inferred as affording a unitary substrate and source for

manifold accidents or modes. The Eleatics simply stagnated the entire universe, not — as they believed — into an absolute substance, but into an absolute Nothing. Still, despite this landing into pure Nihilism, the subtle reasoning with which they defended their paradoxical position stimulated philosophical thought to sundry ever-memorable exertions. The relation of the all-comprising, steadfast world comprehended by what is called "reason," to that of the sense-apparent changeful manifold, became henceforth a leading problem of philosophical speculation.

As to Spinoza's absolute Substance, in which all reality, all possible infinite attributes, are conceived as an eternally simultaneous and undifferentiated totality of Being, and which therefore must be itself ever immutable and identical; it is obvious that this seemingly all-involving *ens realissimum* and *perfectissimum* is in verity the Eleatic "Nothing" over again, a nonentity having no qualitative nor quantitative distinctions. And how, it may again be asked, can an identical, homogeneous being possibly differentiate within itself, and actuate the two special attributes, thought and extension, and their divers accidents and modes, so as to constitute our restlessly teeming and diversified world?

The overreaching notion of an identical, immutable "All" coincides with the ineffable Nothing of the Mystics and with the Buddhistic Nirvana. The like is always reached when speculation eliminates actual diversity and change from what it deems to be supreme reality. But to attribute diversity and change to an *ens perfectissimum* is equivalent to wholly dissipating its ideal perfection. Hence the justification of pessimistic and ascetic creeds.

Identity can manifest itself only as a foil of difference. It cannot be rightly ascribed to the mere conceptual apprehension of similarities and differences attaching to the diverse manifold; but has to be ascribed to the real entity that amid change identically abides. Yet how this can be possible, how something can identically abide despite undergoing changes, is a problem that has never yet been solved. The enduring identity of concepts and their content, which renders thinking possible, is evidently established in extra-conscious latency where our potential memory has its seat. And who has yet disclosed the nature and constitution of that permanent matrix, whence past experience issues identically and repeatedly into present awareness, actual experience being thereby recognized as identical with past experience?

After all manner of trials it still remains a fundamental problem to explain how it becomes possible that the identity of anything can be maintained intact when everything we experience takes place in the perpetual flux of time, and amid its ever-changing and lapsing content. Whatever has been asserted to the contrary, it is logically inconceivable how something can undergo changes and yet remain identical. The puzzle is only heightened when the changing something is declared to be in essence a simple, unextended, uncompounded entity, such as the soul, or the thinking principle, is generally conceived to be. How can it be made intelligible that the inferred seat of our conscious affections and reactions may, despite its alleged simplicity, suffer constant intrinsic changes without losing its identity? To potentially endow a postulated entity with all manner of affective and reactive modes, and in the face of it to declare it to be

a simple, unextended, uncompounded substance, involves all too plainly an irreconcilable contradiction. And thereupon, furthermore, to assert that affections and reactions, which are necessarily intrinsic changes, leave, nevertheless, the changing subject identical or unchanged, is surely heaping contradiction upon contradiction. The assumption that something in existence, and were it even some compound, and not merely a simple uncompounded entity, can spend itself in affections and reactions of whatever kind, and yet remain identically intact; this assumption involves a glaring contradiction. Nevertheless, it underlies all our practical conduct and all our thinking operations.

Kant fully recognizes that the apprehended "identity" of phenomena, though they consciously appear at different moments of time, that such identity of past and present appearances is necessarily dependent on the abiding identity of a matrix, conceived by him as "pure consciousness in general," a matrix which permanently and potentially harbors the conscious manifestations, but which is itself belonging to the transphenomenal apperceiving subject. This identical unity of the apperceiving Ego, maintained amid all phenomenal manifoldness and change, Kant holds to be the supreme condition of objective existence and cognition, and he identifies it with the unity of all phenomenal appearances.

Here Kant hits upon the main crux of philosophical interpretation; namely, how the existence of a transphenomenal subject and its real nature may from actual experience be rightly inferred, as that which potentially and permanently contains systematized all phenomena that casually and partially issue into present awareness; and how amid all this change and

expenditure it succeeds, nevertheless, to retain its own identity. Before this central problem is satisfactorily solved metaphysical systems of whatever kind can have only the value of fanciful constructions.

(3) CAUSATION OR ACTUATING POWER

Substantiality considered not only statically but also dynamically involves agency, force, or actuating power. The inferred existence of what is called "substance" is grounded on the rational need of presupposing a permanent substratum underlying the fleeting and changing phenomena of nature. And such a substance, in order to account not only for the coherence and consistency of natural phenomena, but also for their mutations, has to be conceived as actuating agent.

For this reason Leibnitz, who rightly held that no actuating principle is immanent in the geometrically extended substance of the Cartesians, nor in what is generally called inert matter, was led to formulate his all-efficient conception of "acting force," which he identified with substantiality. A substance with him is out and out "force." And as force is something unextended and immaterial, substances must be immaterial or purely psychical forces. Consequently, he declared pure psychical force or activity to be the very essence of his monads or simple substances. And such psychical force or activity is then made by Leibnitz to account for all movements and mutations in nature.

But waving other serious objections in the way of any kind of self-actuation giving rise to intrinsic mutations within his monads or simple substances, it is

logically unthinkable how anything can any way move or change within simple substances, which have, as Leibnitz himself asserts, "no parts, no extension, no form, no divisibility." Quite irrespective of motion and change in space, every natural occurrence, every apperception and content of the monad, takes place as a flowing process, and such succession and change cannot possibly occur in simple substances such as the monads of Leibnitz are conceived to be. The perceptions and apperceptions of each monad, which as such constitute all there exists of natural occurrences, introduce within these simple beings "parts," "extension," "form," and "divisibility," which are altogether contrary to their simple nature. The problem of agency or actuation, which includes that of causation, is far more intricate and recondite than Leibnitz ever conceived it to be.

Like the assumed conscious content of the imaginary monads of Leibnitz, the actual, all-revealing content of our own consciousness is an ever-flowing phenomenon in time, to which no substantiality, no identity, no agency or force can be rightly attributed. Hume, therefore, truly maintains that "we never have any impression that contains any power or efficacy." And as Phenomenalist, he concludes, "that we never have any idea of power, efficacy, agency, force, energy, connection, and productive quality," which sweeping conclusion is in verity the consistent outcome of pure Phenomenalism or Nonsubstantialism.

What prodigious commotion this force and substance-deprived, soulless and bodyless interpretation of nature created among philosophers and theologians is matter of history. Yet it is quite evident that conscious phenomena, the only phenomena we are actually aware

of, are as such utterly forceless and nonsubstantial. How, indeed, can anything like force or substantiality be attributed to fleeting and evanescent occurrences? Even physicists have lately come to discard the notion of "force" in their explanation, or what they call their description of natural phenomena. No wonder that, after renouncing all hypothetical inferences, they can find nothing like "force" entering into perceptual appearances or presentations. And these perceptual appearances are knowingly or unknowingly the immediate objects of physical research. In physical science what is called "force" is really only an inference of what is perceived as accelerated motion postulated as its actuating cause. Mathematical physics aims to become an out and out phenomenalist science by reducing all natural occurrences to mere modes of motion.

Psychology, on the other hand, when it consistently pursues its introspective course among the immediately given content of consciousness, lands likewise into pure Phenomenalism; in fact, into an utterly meaningless medley of conscious states. To escape this irrational outcome, Psychology has usually postulated some efficient entity as actuating, combining, and cognizing agent, such as an intelligible Ego or supersensible soul endowed with synthetic, apperceptive, or attentive activity, or with special faculties or dispositions. For from the mere congeries of conscious phenomena, arising and dwindling in and out of awareness, no real knowledge can be derived, when they are taken to signify nothing beyond themselves. It is only when certain realistic bearings or implications of the conscious phenomena are positively assumed and steadfastly borne in mind that they gain genuine significance. Otherwise, Psychology, amid nothing

but fleeting and forceless modes of awareness, finds itself reduced to a Phenomenalism far more helpless and nihilistic than that of Hume. For Hume postulated a number of extra-conscious and transphenomenal factors, in order, plausibly, to establish some order and coherence among his chaos of unrelated and evanescent elements of world-construction. No purely phenomenalist Psychology, no significant science of mere conscious phenomena, as such, is at all possible.

It is a mere figure of speech, without real foundation, to say that an antecedent component of the conscious content is, as such, existentially associated with or linked to a subsequent component. By thus assuming a real connection or effective bond between modes of awareness, agency, or power is attributed to the utterly forceless conscious phenomena. And how can something antecedent, something that has ceased to exist, be connected with and have power to summon into actual presence something that has not yet come into existence? This simple consideration is fatal to all Sensation and Association-Philosophy, for they presuppose the conscious elements with which they operate to possess endurance and efficiency, while they are really wholly forceless and evanescent.

The great question of necessary connection or causation has more than ever perplexed philosophers and scientists since Hume made the vain attempt to explain it experientially, as established by an habitual sequence and coexistence experienced as obtaining among the appearance of psychical elements or particulars. With this failure to discover the real bond of orderly connection between conscious phenomena as such, the last remnant of coherence and regularity among the insubstantial procession of evanescent

appearances dissolves no less into Nihilism than the substantiality of mind and matter has under Hume's own scrutiny. Where, then, is the real bond of connection and the systematic order of conscious phenomena enduringly established?

Despite of Hume's out and out nominalistic Idealism, involving pure Phenomenalism and Nihilism, a momentous step forward was taken in the direction toward Naturalism by his keen advocacy of the primacy and paramount instructive value of perceptual occurrences and their experiential order, over that of the mere reproductive play of logical evolutions. In Germany formal logic was at that time held to be the supreme canon of speculative philosophy. Under its sway our perceptual experience was regarded, not as a really original and preëminently reliable source of information, but as something quite indiscriminate, resulting from obscure and confused thinking.

From Hume Kant learned, to his surprise, the essential lesson, that the original material of knowledge is exclusively sense-derived, and that it can nowise be logically deduced from preëxisting general concepts; that the relation between cause and effect is something differing altogether from what in logic is called "reason and consequent"; that only synthetical propositions yield fruitful knowledge, while analytical propositions render merely more explicit what was already implicitly and experientially known. The consistent outcome of this experiential teaching, the outcome which so deeply impressed Kant is, that sense-derived experience can nowise be transcended; that, consequently, all metaphysical attempts to overreach such experience are futile. Kant in all his critical investigations held fast to this revolutionary teaching. He never lost

sight of the fact that the material of knowledge is sense-derived.

But, though Kant acknowledged the truth of the Aristotelean and Lockeian dictum: "*Nihil est in intellectu, quod non fuerit in sensu,*" he eagerly welcomed its Leibnitzian addition: "*Nisi ipse intellectus.*" And henceforth his principal effort consisted in investigating the part which the intellect is playing in experience. The "Critique of Pure Reason," as every student of philosophy knows, is the result of this laborious and profound investigation.

It was principally the problem of causation that gave the impulse to Kant's critical or transcendental philosophy. Here, then, in relation to this fundamental question, if ever, was to be effectively tied the binding knot between the loosely given sense appearances and their systematized apperception. How, then, with his many strings in hand, did Kant really succeed in joining them together? He had on the sensory side first the things-in-themselves in mysterious relation to the outer or spatial sense, which they somehow affect so as to cause it to be filled with appearances that are the material of knowledge. Then he has here also the form of the inner sense, known as "time," which cannot be itself apprehended, but to whose perpetual flux all outer and inner appearances and affections are necessarily subject.

Exclusively with this fleeting building material in time the steadfast fabric of knowledge had thus to be constructed. In order to accomplish this, Kant has, on the side of intellect, first "*empirical* apprehension," whose own apprehending moments are likewise a flowing content of time; and which, therefore, can only snatch up instant by instant what is consecu-

tively given; whereupon "reproductive imagination" has to reconstruct in simultaneous connection the sensorial content of the lapsed moments, rendering thus possible the empirically apprehended extension of space, and the continuity or duration of time, and of their material content. Moreover, Kant held in reserve the categories or synthetical functions which have to convert the empirical or subjective apprehension of appearances into universally valid knowledge, whereby consistent, objective nature is fashioned out of the medley of sensorial appearances. To fully accomplish this objectifying task all work of the synthetical functions has to be systematically consolidated in the "synthetic unity of apperception." And this in its turn inheres in the "intelligible Ego," which belongs to the "noumenal world," where the "objective and universal consciousness" has its real being.

It will be conceded that to hold these many distinct factors of knowledge firmly in mind, while endeavoring to make them all enter into harmonious and efficient coöperation in their task of constituting nature, it will be conceded that this is indeed a prodigious undertaking. Let us then see how Kant succeeds, by means of his stupendous explanatory machinery, to establish the fundamental principle of causation, involving that of force and agency. The incontrovertible fact, directly apprehended on the sensory side, is that everything experienced and everything experiencing is involved in the perpetual flux of what is called "time." And this transitoriness of all actual facts and modes of awareness Kant fully recognizes. On the intellectual side, the grounding axiom is that ancient one, that nothing can arise out of nothing nor revert into nothing. And this

axiomatic permanency and indestructibility of that which underlies the changing appearances, Kant likewise fully acknowledges. With its assistance he derives, by means of his *a priori* category of substantiality, the "substantia phenomenon," which he forthwith identifies with the changing but indestructible matter of the chemists. Moreover, he rightly asserts that force and agency are necessarily attributed to substance, and that the changing manifoldness of the fleeting appearances can be only varying modes of the permanent substance, for they cannot emerge out of nothing, nor revert into it. Consequently, causation, or the necessary sequence of appearances, must be the outcome of the activity of the permanent agent or substance. Matter, declared by Kant to be this substance, would, then, be the veritable determining and manifesting matrix of the appearances, and of their necessary sequence. And this Kant actually maintains towards the end of the "Zweite Analogie." There he says, "Where there is action, and consequently activity and force, there is also substance, and in it alone is to be sought the seat of the fruitful source of the appearances." And as Kant identifies substance with matter, matter must then be the seat of the fruitful source of the appearances and their sequence.

This certainly sounds like outright Materialism. But with Kant this matter is not the transphenomenal material of the physicists; but only "*substantia phenomenon*," dependent itself on manifold existential conditions. And now, in consideration of these existential conditions of phenomenal matter, we get an entirely different origin of the appearances. Instead of matter being the veritable fruitful source, these same

appearances turn out, on the contrary, to be formed by externally "given" sensorial material arising within space and time as pure *a priori* forms of intuition. Appearances are, however, not even then steadfastly formed; for being carried away, increment by increment, with the flow of time, their fleeting moments have to be synthetized in order that they may really appear fully formed. And so likewise has their empirical apprehension to be synthetized, in order that it may simultaneously and connectedly apprehend them. And when, at last, a number of special faculties have achieved the empirical apprehension of full-formed appearances, together with their sequence, they have attained only incidental and subjective validity. In order that they may furthermore attain objective and universal validity, they have to be subjected to the objectifying categories actuated by the intelligible Ego, a procedure *ab extra* altogether incomprehensible. Kant himself recognizes that, if the definite sequence of appearances is not empirically given, then the objectifying category of causation cannot be applied. The category, therefore, does not really constitute the definite sequence in time, but only renders it, in Kant's system, in some inexplicable manner universally valid.

Kant with his keen penetration realizes the profound difficulties in the way of uniting the results of the passive sensorial reception of fleeting phenomena with their empirical apprehension and eventual systematized apperception. Time with its empirical content being in perpetual flux, how, then, can the apprehending intellect, itself acting in time and roaming at random over given appearances, — how can it succeed in synthetically reconstituting the sum total of the fleeting and vanishing content so as to reproduce it with

the help of "reproductive imagination" simultaneously consolidated, and rendered thereupon universally valid by being brought under the influence of the objectifying categories? Where in this purely ideal and intellectual construction of nature is the real nature of actual experience to be found? The vivid play of sensorial appearances, of which it consists, refuses being wholly eclipsed and swallowed up in the shadowy recesses of the imperceptible *mundus intelligibilis*.

Kant's profound insight into the difficulties encountered in trying to explain the origin of perceptual and conceptual modes of awareness, and their mutual relation, opens an amazing vista into the depths and intricacies of the problem of causation, the leading problem of the Transcendental-Philosophy, as well as that of purely experiential systems. In his attempt to solve it, Kant had in his mind, first, that mathematical constructions are *a priori* synthetical; that, consequently, pure reason, regardless of any empirical experience, is in possession of synthetical efficiency, by force of which it can establish synthetical propositions which have necessary or universal validity. And then he found that all experience exists actually systematized in "the synthetic unity of apperception"; while, on the other hand, the empirical material is fractionally and incoherently given in sense-intuition. This being so, it must devolve upon the intellect or understanding to impart coherence, order, unity, and objective or universal validity to conscious experience.

As regards the necessary or universal validity of the *a priori* synthetical propositions of mathematics, a problem which already interested foremost ancient thinkers, it can only be solved when it is shown why the subjective spatial perceptions and time-determi-

nations of each individual come to be universally and objectively congruent or coincident with those of all other individuals; and why the general constructive norm and the geometrical properties of a definite kind of spatial form are binding, for all congruent spatial forms; or the general numerical quantities of definite time-determinations are necessarily decisive for the same numerical quantities of all discrete things.

Respecting the necessary or universal validity of each individual's unity of apperception, it may be asked, whether any individual is really in possession of a synthetic unity of apperception in which all sensorial appearances are systematized with universal validity? Is it not, in fact, a laborious experiential task to validly ascertain the real constitution and connection of sense-given appearances, so as to derive therefrom a universally valid system of knowledge? And when has it ever occurred that, without such laborious investigation of actual experience, facts of nature, physical and psychical, have been rightly apperceived and rendered universally valid by means of *a priori* concepts?

Here also the fundamental fallacy consists in attributing agency or causative efficiency to psychical states, while all psychical states are utterly forceless. Consequently psychical world-constructions are but phantom air-castles.

Exact experimental science makes short work of the problem of substance, force, agency, and causation. Yet it succeeds above all other means in vastly and correctly increasing our knowledge of nature. But, though practically relying exclusively on exact experimental verification, it proceeds not wholly without the guidance of general *a priori* principles. In all scientific

research the ancient maxim, "*Ex nihilo nihil fit*" is essentially presupposed. And although like the philosophical Phenomenalists, the purely mathematical physicists profess to discard the realistic notions of substance, force, and agency, aiming to reduce all natural occurrences to mere modes of motion, they only ignore, as unessential to their kinematic equations, the nature of that which moves, and of that which causes the motion. And it is in verity under the positive supposition that there exists something that moves in definite ways, and something that causes the definite motions, that physical science has made its giant strides in the recognition of definite relations of dependence obtaining between perceptible phenomena.

The eminently fruitful conceptions, on the one hand, of substantial matter and its indestructibility amid all its changing modes of appearance; and, on the other hand, of force or energy with its equal indestructibility in actuating accurately measurable changes; these highly useful conceptions of substance and agency have served as supreme guiding principles in the investigation of physical occurrences. And they are themselves grounded on the ancient maxim: "*Gigni de nihilo nihil, in nihilum nil posse reverti.*" This is, indeed, fully acknowledged by J. R. Mayer, and virtually also by Grove, Helmholtz, and most thinking physicists; for the impossible construction of a *perpetuum mobile* is *a priori* accounted for by the same grounding axiom, that nothing can be got out of nothing.

But neither Mayer nor Grove nor Helmholtz, nor any other physicist, has in the remotest degree proved the real existence, or disclosed the true nature, of what they call "matter" and what they call "energy." This insight, if it ever can be attained, has to be arrived at

by a correct theory of knowledge. For the changing substance called "matter" is only inferentially revealed in perceptual appearances, and the change-inducing force or energy is only inferentially postulated as that which causes the mechanically equivalent changes. Moreover, as already mentioned, no qualitative distinctions are at all accounted for by this mechanical method of interpretation; and these are, after all, the most essential integrant characteristics of perceptible objects. Worst of all, mechanical interpretation necessarily excludes all psychical occurrences from its rigorously closed concatenation of physical facts and occurrences. The psychical manifestations that are running parallel to physical phenomena have here to be looked upon as mere ineffective, in truth, superfluous epiphenomena. And the ancient riddle of the interconnection of mind and body and of body and mind remains wholly unsolved.

It must be confessed, then, that the real agencies, which from within and from without are underlying and actuating the phenomenal play of awareness, that these phenomena-producing and propelling powers have never yet been disclosed.

(4) THE PROBLEM OF AN EXTERNAL WORLD

The search after the source and meaning of conscious phenomena meets on its way the problem of the real existence of what is called the external, or better, the extra-conscious, sense-transcending world, — a world of real, abiding entities, forming, somehow, a steadfast counterpart to the world figured in transitory perception and to that represented in discursive thought.

The conceptual world, the world of ideas, rises, at

times, into actual awareness from unconscious depths of our previously informed being, irrespective of actual sense-impressions. This is quite evident and indubitable. The perceptual world, the world of sensorial presentations, though its phenomena compose to all appearance a sphere of existence outside the percipient's own body, yet it has become certain to philosophical contemplation, and is actually corroborated by dreams, that these seemingly external phenomena are really modes of the percipient's own awareness. The so-called external world being thus apprehended as having its seat at one and the same time outside and inside of what we call our body, we are here brought before one of the most perplexing paradoxes still awaiting correct philosophical interpretation. It is certain that we perceive persons and things outside that which we perceive as our own body. And yet it is just as certain that all these perceptions arise within our own Being.

Whether to the world phenomenally figured in perception there corresponds a world of real, extra-conscious existents, may be considered the most momentous of all philosophical questions, and perhaps the most difficult to answer. On its decision pends the fate of pure Idealism, as well as that of other philosophical systems. And it would surely be a delusion to believe that any satisfactory solution has yet been arrived at. It is the supreme task of epistemology to furnish such a solution.

(5) UNIVERSALS AND PARTICULARS

Another phase of the never-relinquished effort to discover the true seat and nature of permanent and

efficient reality has played a prominent part in philosophical discussions ever since the unchangeable One-and-All of the Eleatics was opposed to the Heraclidian perpetual flux of perceptible phenomena. Plato and Aristotle based their respective ontological views on the fundamental contrast obtaining between the particulars of sense and the universals of reason.

Plato fashioned his archetypal world by placing the seat of true reality in the universals as apprehended by reason, and by holding the particulars to be mere ectypal appearances, or perishing things receiving their being and significance from partial or semblative participation in the transcendent reality of the universal. Aristotle, on the contrary, arrived at sensorial Experientialism by declaring the particulars given through sense to possess full reality, the universals being implicated predicates of the same. After more than two thousand years of most searching discussion essentially the same controversy remains still unsettled. Platonic and Aristotelean views still confront each other. We have still among us Scotus Erigenas and Roscellines, Abelards and Occams.

The transubstantiation of logical relations into metaphysical entities culminates consistently in logical Pantheism or so-called Panlogism. On the other hand, the attribution of true reality to sense-apparent things of an outside world leads to Materialism, hitherto the general position of modern natural science. As to the ascription of fundamental reality to the sensorial elements themselves and their combinations, such sensorial Idealism, still prevalent, has always led and must always lead to pure Phenomenalism, into which our most advanced physics and psychics have at present helplessly drifted.

Here we are face to face again with the fundamental dilemma of philosophical interpretation. All we are directly aware of is what is actually given in our conscious content. But all conscious awareness, however systematized, is as such in constant flux, and consists of nothing but insubstantial, perishing phenomena. We have here, therefore, pure Phenomenalism, or nothing but a fleeting panoramic show within the one present moment of lapsing time. This, in truth, is the inevitable consistent outcome of taking the conscious content to signify nothing beyond its own psychical self.

Despite the dialectic gymnastics of our Parmenides and Protagoras, and despite the pretended rejection of realistic implications by our mathematical physicists, a pure phenomenistic science is an impossibility. An array of tacidly assumed realistic presuppositions imparts in such attempts to the evanescent phenomena the indispensable modicum of support and staying quality. For our accumulating experience, and its rational continuity, forces thinkers intuitively and speculatively to transcend the phenomenal play of momentary awareness by postulating some enduring reality as the preserving and issuing matrix of our memorized, systematized, and cognized experience.

The real puzzle here is, that something so transient and evanescent as the entire conscious content with all its particulars and universals actually is; that the successive content of this fleeting moment of awareness is nevertheless by some transcendent means preserved as accumulated and systematized experience, and is recognized as such. This transphenomenal harboring and resuscitation of what has constituted

the vanished past, is what John Mill called the "final inexplicability." Surely no approximately satisfactory answer has yet been given to this weighty question. And the unsettled state of philosophy is principally due to the fact that no valid proof or demonstration of the real seat and nature of the preserving and issuing matrix of conscious phenomena, and of their latently cumulated and systematized import, has yet been forthcoming. It cannot possibly be found in anything that forms part of the conscious content, not in its sensorial particulars and their perceptual combinations, nor in its conceptual universals and their implicated relations, nor in the entire content of the moment of actual apprehension. For these are all alike fleeting modes of awareness, which can nowise constitute their own permanent matrix, nor the apprehending subject to whom the awareness accrues. It does not avail here to postulate with Materialism as permanent material things the perceptual particulars themselves, declaring them to be extra-conscious existents that compose the real universe, and of whose peculiar arrangement and activity in organisms the conscious content is a functional outcome. That which goes by the name of matter can nowise produce and apprehend conscious states. No kind of motion or functional agitation of what are called material compounds can be conceived as resulting in conscious awareness. This is becoming more and more generally admitted; but not long ago mind was believed to be a functional outcome of matter by most scientists.

On the other hand, to postulate with intellectual Idealism conceptual universals as phenomena-producing entities or faculties, amounts merely to declaring a special constituent of the conscious content to be its

own source of emanation, and that of all the rest. For we have no other actual experience of universals, save that contained in the conscious content. All realistic inferences therefrom are, consequently, of a nature transcending what appears in consciousness, and have as mere inferences to be epistemologically made good, in order to be acceptable as valid. Instead of it, we have on the one hand the conceptual totality of the conscious content deified, and on the other hand its perceptual manifold materialized. Criticism in its turn reduces the conceptual Deity to a "Grenzbegriff"; and all the wealth of the sense-revealed, perceptible universe it takes to be continuously originated from a timeless and spaceless world, and to be as continuously dissolved into it, emptied of all experiential qualitative and quantitative distinctions. No appreciation in all this of the endlessly laborious travail that fashions perceptible things and perceiving individuals. Despite all the strenuous efforts of Idealism, Materialism, and Criticism, to reach by legitimate means of valid demonstration the efficient, permanent reality which identically underlies the phenomenal play of actual awareness, of which all universals and all particulars, as actually experienced, form an integrant part; despite of it all, philosophy finds itself still adrift on the dissolving waves of ever-lapsing time.

(6) INNATE FACULTIES OR DISPOSITIONS

Related to the perennial controversy concerning universals and particulars is another contention which has greatly agitated modern philosophy. The task here was to determine the kind of cognitive equipment which the thinking individual brings with him into

the world. Whether the mind, to start with, is a blank, or whether it is innately stored with essential knowledge consisting of definite ideas fully performed before the acquisition of post-natal experience? Or, again, whether only definite dispositions are innately preëxisting which determine the cast and order in which post-natal experience is received? Extreme Sensationalism believes in *tabula rasa*, extreme Intuitionism in innate ideas, and Criticism in preformed dispositions. The solution of this problem so important to psychology, and, indeed, to all other philosophical disciplines, has lately been essentially aided by facts of organic evolution. And it is to be expected that in the light of vital organization it will receive further elucidation.

(7) SUBJECT AND OBJECT.

Likewise opened for solution by the many-sided fundamental puzzle of philosophy, how and by what agency steadfast knowledge is extracted from the random flow of phenomenal appearances, to what kind of reality it actually refers, and in what kind of permanent matrix it has its latent seat; opened by it is another of those perplexing questions which has conspicuously figured in philosophical discussions. The question here alluded to is that of subject and object in cognition. What is constituting in actual experience the object of knowledge, and what the knowing subject, or that which apprehends and knows what is presented as object?

The conscious content is all that any way emerges into awareness. And arising, as it does, in the perpetual flux of time as a unitary, all-revealing moment of actual experience, it admits nowise of being bisected

into object and subject. It is in its entirety, as soon as consciously manifest, an apprehended or known object. To be consciously aware of anything is to apprehend or to know that much of it at least. Of course, there occur all possible gradations of distinctness and comprehension with which modes of awareness are presented and cognized, inclusive of their complemental psychical implications. For all directly awakened cognition implies as its complement resuscitation and recognition of a more or less comprehensive complex of conscious states previously systematized. The presentation and cognition of a directly awakened mode of consciousness serves thus as a temporal signal, whereby the complemental complex of previously experienced conscious states is representatively summoned into awareness and recognized as already known.

I cognize, for instance, a certain odor as sensorially aroused and now actually present, and recognize it as a constituent of a definite complex of previously experienced conscious states called a violet or a rose, as the case may be. That which awakens the awareness of the definite odor awakens in consequence of it also the awareness of its remembered conscious implications. But shall I find the real violet or the real rose among my remembered conscious states? Where, then, have these their real being? And whence do the remembered conscious states themselves issue from latency into actual awareness on presentation of the sensorially awakened signal that summons them forth? Furthermore, what kind of being or subject experiences this complex of conscious states? These are the essential questions.

As regards the paramount importance of directly

awakened signals or signs in relation to conscious representation and recognition of previous experience, we need only consider how the volitional production of linguistic signs gives rise to the rationally systematized conscious reinstatement of what they are signs of, rendering thinking possible. Yet linguistic signs are altogether experientially inculcated after birth.

The recognized object forms directly always part of the conscious content. And all conscious states are objects of cognition. But as to the agent or subject to whom experience accrues and who apprehends and knows, neither Hume nor Kant, nor any other candid observer, has ever been able to detect him anywhere within the conscious content, as forming part of present or remembered experience. Hume concluded in accordance with his Nonsubstantialism, that no such agent exists. Kant believed that it dwelled as intelligible Ego in a supernatural sphere, and that unrecognized it accompanies all cognition as awareness that it is I who knows. Fichte asserted that it is an all-positing activity; Shelling that it is "Subject-Object"; Hegel that it is the "Idea." Common sense takes the perceptible human individual to be the bearer and knower of the conscious content. But, if so, what is the real nature of the perceptible individual who experiences and knows?

The particular perceptual forms, the so-called objects or things, which intrude their presence into consciousness with compelling insistence, seem preëminently to single themselves out of the conscious content as objects of knowledge, leaving the unextended components in the background as contrasted subjective states. The whole of consciousness becomes thus seemingly divided into a "me" and a "not-me," or

at least into object and subject states. But forming part of the same object of knowledge together with the extended perceptual objects are found also, not only their own remembered so-called "ideas," and the wholly unextended verbal signs signifying them; but likewise whatever relations may become consciously revealed as obtaining between them and the entire rest of the conscious content. In fact, as already stated, the conscious content in its entirety, with all its cognitive, affective, and conative modes of awareness is, as such, the apprehended and known object. The knowing subject appears nowise in actual awareness. It is therefore an unwarrantable procedure to preassume as such some fanciful agent, in order to gain a substantial support for the evanescent constituents of the conscious content, and also a consolidating power by force of which they are then held to be consistently synthesized into valid rational knowledge. If such a subject there really is, its existence and nature have first to be scientifically inferred from definite data given in actual experience, before it can be legitimately used in explanation of such experience.¹

At the bottom of all these philosophical riddles lies the problem of the nature and source of what is consciously manifest as memory. Where, indeed, can be its seat, and in what does really consist this mysterious vehicle wherein past experience latently abides, ready on occasion to issue significantly into conscious awareness as accumulated and ordered knowledge? Some steadfastly organizing power is here evidently at work weaving, coordinating, and consolidating into perma-

¹ This is a cardinal point upon which **Dr. Shadworth Hodgson** has so emphatically, lucidly, and decisively insisted.

nent structure the lapsing moments of casual experience. This systematizing and substantializing power cannot possibly be found among the transient phenomenal appearances of consciousness itself. It obviously achieves its results in a region transcending conscious awareness. To give to such extra-conscious agency the name either of mind or body, as is usually done, is again to hypostatize into substantial permanency something known only as conscious phenomenal appearances; for as such only do we actually know what we call our mind, and what we call our body.

The general upshot of these critical remarks, applied to some of the principal problems of philosophy, is simply that all psychical or idealistic Phenomenalism leads inevitably to unmitigated Nihilism, to a phantasmagoria of evanescent meaningless appearances, arising out of Nothingness, floating an instant in the unsubstantial media of subjective space and time, and vanishing again into the same vacancy whence they emerged. Nihilism is what consciousness in its own secluded sphere is exclusively freighted with. And no way has yet been found out of the magic circle of phantom-peopled Solipsism. It is only by a correct interpretation of the realistic implications of conscious phenomena, arrived at by aid of a valid theory of knowledge, that the significance of psychical manifestations, and with it the significance of our own Being, and its life in this world, can be philosophically determined.

III. THE IMMEDIATE SOURCE OF ALL KNOWLEDGE

MODERN philosophy has proved that that which is consciously revealed consists directly of nothing but modes of awareness. These may be classified as feelings, sensations, perceptions, emotions, volitions, and thoughts or ideas; or more succinctly as affections, conations, and cognitions. One and all, these have no other experienced existence, save as constituents of the actual conscious content.

This cardinal truth, firmly established by modern philosophy, leaves no doubt that our individual conscious states are the sole direct medium of revelation, and that everything consciously present consists out and out of actual modes of awareness. That which consciously emerges from unconscious depths is therefore the exclusive vehicle through which all knowledge of reality is conveyed. Reality becomes manifest to us living beings solely within the medium of our consciousness. This truth, when once recognized, appears almost self-evident.

The entire conscious content with all its wealth of knowledge is, however, obviously a transient phenomenon; something not only emerging, dwindling, vanishing, and being renewed as a whole; but something whose constituents, while forming among themselves changeful configurations, are severally and collectively in constant flux. This moment there is consciously present a complex of certain feelings, sensations, per-

ceptions, emotions, and thoughts which make up the content of our awareness for the time being. The next moment these same feelings, sensations, perceptions, emotions, and thoughts have completely vanished out of existence, having been superseded by a new set of similar transient phenomena.

The flowing conscious content forms thus our one moment of ever-renewed awareness. And, as such, it can obviously possess no modicum of self-stability, no substantial existence to save it from utter vanishment and annihilation. Nevertheless, it is evident that this kaleidoscopic play of evanescent conscious states is all that in any case is immediately and actually experienced. Nothing whatever is at any time consciously present but just these configurations and combinations of flowing and vanishing phenomena. They yield the only available data out of which the entire fabric of knowledge is constituted. And as everything that composes our consciously revealed microcosm turns out to be woven out of such transitory phenomenal appearances, pure Phenomenalism is the necessary outcome of reasoning which does not transcend in its interpretation that which is thus given in actual awareness.

It is all-important to philosophy to recognize this utter phenomenality of all conscious awareness, its out and out forceless, transitory, and evanescent consistency. The failure to realize it lies at the root of most philosophical perplexity. The attribution of reality, substantiality, power, permanency, self-significance to conscious phenomena has been, and is still, the chief obstacle in the way of a consistent philosophical interpretation of nature. Heedless of the evanescent and forceless consistency of conscious phenomena,

the advocates of mental Atomism substantialize certain segregated elementary constituents of the conscious content, and construct therewith their wholly insubstantial fabric of sensorial Idealism. The advocates of Conceptualism, on the other hand, hypostatize into substantial permanency as efficient agents or power-endowed faculties other conscious modes. While, in their turn, the Materialists seize upon mere phenomena of sight and touch as their building material, declaring them to be indestructible, extra-conscious entities.

World-constructions with unsubstantial ephemeral conscious phenomena must necessarily dissolve into thin air under the hand of their makers, unless these artfully manage to introduce from extra-conscious sources all that is required to impart coherence and stability to their all too tenuous and volatilizing building material. Hume, for example, in order to impart consistency and permanency to his sensorial material, unwarrantably and inconsistently substantialized it, making fictitious permanent entities of his vivid "impressions" and their remembered "ideas." Hume, the professed Phenomenalist and Nonsubstantialist, introduces, moreover, surreptitiously into his system eminently potent extra-conscious agencies, such as memory, ability to cling together or associate, habit, and the like. And so are all nominalistic or sensualistic Idealists compelled to have recourse to extra-conscious, efficient agencies in order to provide some consistency and stability for their ideal structures. For can there be anything more unsubstantial and fugitive than a touch, a sound, a sight, a taste, a smell, a feeling, an emotion, an idea; in fact, an "impression," a "sensation," a conscious state of any sort?

Surely, nothing can be less fit wherewith to construct the solid, permanent world we are actually conversant with. Evidently what has been hypothetically postulated as substantially subsisting is not the present conscious state as such; but the extra-conscious source whence numberless reproductions of its like have emanated in the past, and are expected to emanate again into awareness on future occasions. The extra-conscious potential sensibilities, through whose actuation the transitory modes of awareness arise, are here the abiding modes of existence, and not the modes of awareness themselves. Yet whole systems of interpretation, believed to be eminently scientific, are still woven out of such purely ephemeral stuff as sensations and other modes of awareness obviously are.

Kant, who recognized the phenomenal and transient consistency of conscious appearances, believed to have discovered permanent modes of intellectual synthesis, by means of which the random and fleeting manifold of sense becomes converted into steadfast, universally valid knowledge. But the truth is that, despite his strenuous endeavor to reach transphenomenal reality, he never really escaped out of the spectral domain of pure Phenomenalism. His synthetic categories are only modes in which he found the constituents of the conscious content already combined; mere modes of phenomenal coexistence and sequence devoid of realistic efficiency. They constitute nothing whatever transcending the conscious content itself; neither on the side of sense, nor on that of reason. No knowledge of the real things-in-themselves on the sensorial side is at all attained by the categories. Nor are they found efficient to yield the remotest knowledge of the

intelligible world which Kant believed to exist beyond individual consciousness. They exhaust their alleged synthetic power wholly within the sphere of the individual's sensorial awareness among nothing but phenomenal appearances, utterly impotent to convert such fleeting modes of awareness into permanent transphenomenal knowledge.

The assumption of a real world of unknowable things-in-themselves or noumena, which by affecting the individual's sensibility are causing it to be filled with the appearances which constitute the raw-material of knowledge; this assumption is with Kant a mere matter of unproved common-sense conviction, confirmed by what he had learned from Hume concerning sensorial experience. Hume himself, more consistently, ignored altogether the origin of his vivid impressions. And still less founded on proof of any kind is Kant's postulation of an intelligible, supernatural realm of subsistence, whence he draws, and in his system is forced to draw, all the efficiency and substantiality, which he makes his categories vicariously impart to the sensorial material. Kant's "Transcendental-Philosophie" is, in truth, as pure a Phenomenalism and Nonsubstantialism as the nominalistic Idealism of Hume. Only that Hume imparts fictitious substantiality and efficiency to the random sensorial material, while Kant imparts it just as fictitiously to his categories and the "Bewusstsein überhaupt."

Hegel, the typical Conceptualist and Absolutist, after having individually gathered experiential knowledge from every available source, and having it systematically stored away in extra-conscious latency as his own securely memorized possession; after all this laborious self-preparation he made himself and the

world believe that his own assiduously generalized and consolidated knowledge was in verity issuing as conceptual reality, not from the receptacle where he had actually stored it, but quite independently as self-subsisting conceptual evolution from out the plenary being of an eternally preëxisting Absolute. Mere memory of randomly gathered superficial experience, systematized within the individual being of the philosopher himself, is here obviously the veritable source whence all this unctuously sublime conceptual display actually proceeds.

Amid such alleged ideal world-constructions, which the teeming fancy of the master, and that of his many world-evolving disciples have palmed upon a credulous audience, it has been left out of consideration, whether to the evolutionary performances within individual consciousness there corresponds in reality, something super-individual and universal outside of it or beyond it.

The ineluctable epistemological problem is precisely to find a legitimate way out of the charmed circle of individual consciousness into the universal world of genuine reality. Hegel attempts to reach it by a *salto mortale* into vacancy.

Kant, one of the most conscientious, painstaking, and epoch-making thinkers, after laboring most assiduously at this supreme task of reaching transphenomenal knowledge, had to confess that only that which appears to us individually in space and time can be an object of knowledge. "*Noumenorum non datur scientia*" is his emphatic conclusion. Fichte, on the contrary, evaded the insurmountable solipsistic barrier by boldly declaring active consciousness, as such, to be the creator of the world of reality at large, thus virtually

identifying his individual experience and thought with universal Reality and Being. His followers, and he himself, tried, later, to amend the prodigious solipsistic pretensions of such a world-creating Ego, walking the streets in the shape of a German professor of philosophy, by completely ignoring the impenetrable boundary, encompassing individual consciousness, and declaring its wholly secluded, phenomenal, and evanescent content to be the real permanent content of an all-comprising universal consciousness.

But can there be a more arbitrary and fanciful procedure than that to seize upon what we experience as volitions, or as concepts, or on whatever other constituents of individual consciousness, severing them from their complement in the unitary conscious content, and from their real matrix in the conscious individual, and transposing them then generalized and substantially hypostasized into unknowable regions of extra-conscious permanency as self-subsisting and self-acting entities? The principal motive that urges thinkers to adopt such unscientific procedure lies altogether outside the sphere of actual experience. It is inspired by the mystic faith in an absolute Being, from whose eternal totality of existence all individuation and all knowledge is believed to proceed.

The primal source of Being and Becoming is, indeed, a mystery beyond human ken; but neither Plotinus nor Spinoza, neither Leibnitz nor Schelling, neither Hegel nor Schopenhauer, have in the least succeeded in rationally evolving our actual experience of nature from an absolute Substance, or from an universal Intelligence, or from an omnipotent Will. It is, indeed, an irrational endeavor to try to conceive how an eternal, unchangeable, unitary Being can emanate or produce

the changeful manifold of temporal occurrences. Nothing changeless can be rightly conceived as the origin, source, or matrix of change; and nothing indivisible as the producer of manifoldness. Here we are face to face again with the Heraclidean and Eleatic dilemma. Fichte and Hegel incline towards the Heraclidean horn. With them the world is an ever-flowing product of rational activity. Schelling and Schopenhauer, on the other hand, incline essentially towards the Eleatic horn. They conceive the creation of the world as an irrational act on the part of the primordial One and All; in fact, as an apostatic wilful and sinful shattering of its self-contained perfection and repose.

Besides the mystic faith in an Absolute, there is an experiential reason which urges such philosophers as believe in a plurality of conscious beings to merge the content of the sundry individual consciousnesses into an all-comprising universal consciousness. This consists in the inevitable conclusion, that these separate consciousnesses recognize one and the same transcendent universe, in which their individual bearers move and have their being. But it is exactly the scientific justification of this self-transcending inference which forms the fundamental epistemological problem, without whose correct solution there can be no valid insight into the realm of extra-conscious or transphenomenal subsistence. Being aware of nothing but our own individual conscious content, how can we know that there exist other conscious beings besides ourself, or, indeed, any individual bearer of this conscious content? And, if so, what is its true nature? Moreover, what gives us the right to conclude that there is existing beyond our individual consciousness a transphenomenal universe? These, surely, are the vital

questions. No *a priori* Ontology, no Panlogism, can here be allowed to transubstantialize transient phenomena of actual experience into permanent states of universal Being. Only an experiential epistemology scientifically corroborated and verified may perhaps to some extent accomplish this supreme transcendental task.

Experientially inclined thinkers have recourse to various devices, in order to impart ideal consistency and permanency to conscious phenomena. Conscious existence is thus sometimes regarded as a coherent series of abiding conscious experience, or as a continuous stream of enduring consciousness. This, however, amounts to ascribing continuous existence to conscious states, as such, after they have passed out of awareness, or have ceased to be conscious. But the ceaseless flux of time, in which all conscious states have their being, inevitably draws them along into the vanishing of the irrecoverable past. The conscious content consists not of an existential continuity of the identical conscious phenomena, but in a focus of ever-arising, ever-dwindling, ever-renewed conscious manifestations; and it is as such that it constitutes the all-containing moment of actual experience. If not renewed from moment to moment; if its evanescent phenomena were not instantly replaced by other more or less equivalent phenomena, conscious awareness would have no consistency whatever, and the entire microcosmic world of consciousness would the next moment have faded out of existence, as is actually the case on falling asleep.

To escape the nihilistic implications of pure Phenomenalism, or genuine mental Idealism, another subterfuge is at times resorted to. A conscious state may

display in actual awareness all grades of vividness, from faintest to brightest appearance. On the strength of this, it has been hypothetically assumed that they may grow so faint as to dwindle altogether out of awareness without losing their essential nature as conscious states. They are imagined to continue in existence as such below the threshold of actual awareness, and then on occasion to re-emerge above it as identical entities. But to be aware of something is evidently the same as to be conscious of it. There is no awareness apart of special modes of awareness, no consciousness apart of special conscious states. Consequently, the conscious states, as such, have their existence only in actual conscious awareness, and cease altogether to exist as soon as they are no longer consciously apprehended, as soon as they disappear out of the all-revealing moment of actual awareness.

Of course, conscious states, our only medium of actual experience, must emerge from some permanent source of emanation. They cannot arise out of nothing. And, besides, they carry with them the assurance of representing past experience. Here the task is to demonstrate the seat and nature of the emanating matrix, and to explain the paradoxical fact, that something that has itself ceased to exist can, nevertheless, be existentially represented by something that comes into manifest existence at some future time.

It is safe to say that this eminently paradoxical fact of experience has never yet been satisfactorily explained.

IV. THE INDIVIDUAL MICROCOSM

The out and out conscious consistency of our world-revelation, and the utter phenomenality of the conscious states through which such revelation is given, are facts readily discernible, and open from moment to moment to incontestable verification. A kaleidoscopic play of fleeting modes of awareness is all that is immediately and actually experienced. Consequently, it is the only available source whence the entire fabric of knowledge is derived, and the only medium in whose light we conduct our life. The task at hand is to discover how, by means of such perishable data, the seemingly steadfast inner and outer worlds we actually recognize and intuitively believe in become consciously established.

It is evident that anything like stability and efficiency, if at all to be found, cannot possibly belong to what is consciously subsisting, not to the world experienced as a conscious phenomenon. Even Berkeley, the strenuous expounder of nominalistic Idealism, found that "there is nothing of power or agency" in "all our ideas, sensations, or the things which we perceive," "that one idea or object of thought cannot produce or make any alteration in another." All modes of awareness are, in fact, forceless phenomena involved in the ceaseless flux of time, and with it necessarily lapse from moment to moment out of awareness into the irrecoverable past.

How these vanished modes of awareness come to be

successively replaced by equivalent or similar modes; and how by means of the newly arising states the rational continuity of conscious life, past, present, and future, is maintained; these are fundamental problems which a theory of knowledge has to solve. It is clear that a world built of nothing but ephemeral stuff, such as conscious phenomena are really made of, would at best be but a dream. And, even then, the dream could not be self-subsisting and self-sustaining, but would necessitate a dreamer persistently dreaming it. Now the world actually apprehended by means of conscious states, the so-called common-sense world, this apparently enduring world of suns and planets, of boundless expanse and infinite time, of our familiar earth and its teeming forms of life, including our own being with its consistent life-history and abiding sense of personal identity; all these consciously revealed modes of more or less steadfast existence must surely be sustained by something incomparably more coherent and consistent than the mere evanescent appearances of a mind-woven dream could possibly be.

It has, therefore, first of all, to be explained how the stable common-sense world we are all conscious of has come to be constituted out of the evanescent modes of awareness which compose the conscious content. It is, however, as matters now stand, in our highly developed and richly furnished consciousness, no easy task to distinguish within its ready-made world-view that which is actually given in the fleeting conscious content from what is, moreover, inferentially assumed as implicated in its revelations; no easy task to disentangle what in our individual consciousness constitutes our own and other bodies and minds, from what we infer them to be in reality beyond our awareness of them,

which consists of nothing but transient conscious states.

In our developed consciousness modes of awareness are elaborately established resultants of former experience, which in the course of time have accrued to us unitary beings, endowed with preformed ways of sensibility and receptibility. Present modes of awareness are, consequently, for our cognition intricately significant complexes of direct and indirect signs, signifying more or less comprehensively systematized groups of formerly experienced facts. And the experience here directly signified forms part of the vast fund of latent knowledge we call our memory. Introspectively isolated conscious states, as such, are therefore to be regarded as mere signs, whose own mental characteristics and conscious composition do not contain or reveal the nature of what they are signs of. They only symbolically suggest the existence and meaning of that which they symbolically imply. A specific odor, for instance, may signalize a remembered species of flower; a definite colored form signalize a certain group of previously known tangible objects; a predicated quality something belonging to a previously known class of subjects.

In fruitful introspection it is this memorized and systematized knowledge that is explored, not the nature and the direct actual connections of the conscious facts as composing immediate awareness. A word — to bring forward an extreme case — when introspectively contemplated is not to be considered merely as the present sensorial feeling of articulation or sound that constitutes it, but it is to be apprehended as a pregnant sign representing a definite group of latent knowledge. An introspected visual percept, a landscape, for in-

stance, does not merely mean the sensations that go to compose it, not the mere shaded and colored forms in actual awareness, which are only definite specifications of visual space. These are obviously but consciously present signs of an entire assemblage of perceptual objects with their accompaniment of associated experience previously gathered; objects called the "soil," the "vegetation," the "sundry forms of life," all trailing from latent memory rich complements of signalized knowledge. These rather trivial remarks would be almost superfluous if the purely phenomenistic attempt was not actually made to derive instructive meaning from analysis of the direct composition of the conscious states immediately present in awareness without reference to anything beyond.

The cumulative representation of knowledge by means of conscious signs renders possible the issuing into simultaneous awareness of an extensive reach of previously acquired and systematized experience. Previous experience is being thus ever more or less completely recollected into each moment of actual awareness. And it is preëminently this representative concentration of knowledge in the compass of each successive moment of awareness that renders our conduct in life consistently and rationally governable. There exists no other conscious apprehension of gathered experience but that which is momentarily present in awareness. And only by means of representative signs, signifying whole provinces of previous experience, is such recollection into practical simultaneousness rendered possible. In just such representative simultaneousness of conscious states, with all their revived or implied associated significations, consists what is called the "present," in contradistinction of what are called

the "past" and the "future." It is the essential characteristic of our mental organization, and the real vital function of our consciousness, to be so constituted as to focus previous, time-scattered experience into present awareness. And it is only by means of involuted systems of representative signs that this can be effected. Present awareness brings with it the resuscitation and recognition of past experience, involving expectation of similar experience in the future. What we have formerly experienced as our own being and the world at large dwells systematized in unconscious latency as our so-called memory. It becomes consciously revealed in our ever-renewed moment of more or less comprehensive awareness. The focussed content of these moments of awareness, signifying vast domains of gathered experience, constitutes not only our sole apprehension of existence, but also the conscious microcosm whose affective, conative, and cognitive revelations form the exclusive guiding medium of our actions. We act altogether on the information of such represented and recognized experience arising in our moment of conscious awareness. The direct conscious execution of our actions is immediately aimed at what is consciously revealed. The chair I perceive and intend to move, and which I am now moving, forms certainly part of my conscious content. It was as such that it became the direct object at which my activity was aimed. We really move and act exclusively within the sphere of our conscious content and amid its revealed appearances. Whether to these revealed conscious appearances, whether to the perceptual chair, for instance, there corresponds a permanent, extra-conscious existent subsisting independently of being casually perceived; this all-important question,

though practically doubted by no one, constitutes theoretically the fundamental problem of epistemology.

As all we are actually aware of consists of conscious states, by what special conscious modes do we become aware of what we call our own body? The direct awareness of our own body forms the groundwork of all other awareness. Consciously given, as foundation of our bodily awareness or its self-feeling, is a massive expanse of complex inner sensations, whose steady flow in time is felt as something constant, though its multifold constituents are more or less changing in character and varying in respective prominence. These fundamental bodily feelings prove on scientific investigation to be dependent on certain organic activities and needs, and are in consequence called "organic" or "internal" feelings or sensations (*Gemeingefühle*). The vital movement in which life is found to consist its breathing, extending to what is visually revealed as the living components of its tissues; its circulation coursing through minutest capillaries; its digestion involving a vast area of glandular activity; in fine all its manifold ceaseless commotion which ministers to the vital play of functional disintegration and reintegration, and which pulsates in all parts of our organic frame, and creates the fundamental feelings of organic need: hunger, thirst, sleepiness, suffocation; all this makes up the complex activity upon which our abiding feeling of bodily existence and extension is primordially dependent. This being the case, can Idealists persist in sincerely believing that without such vital, organic commotion they could have any feeling or awareness of self-existence of whatever kind, and consequently awareness of anything at all? Yet they have consistently to deny the real existence of vital

organization; the real existence of their own body and of that of all other beings. There is no escape for them from this all-volatilizing predicament.

The vague feeling of bodily existence and expanse, when centralized by means of a convergent neural system, becomes more or less definitely circumscribed by a graduated continuity of sensations, arising in what is consciously perceived as the cutaneous surface of the body. And this organically felt form gets to be still more distinctly outlined, and its parts more clearly distinguished, from within by specific "local signs" and feelings of movement, and from without by contact sensations of pressure, temperature, and feelings pleasurable or painful.

Such direct organic or internal awareness of our body, quite irrespective of special sensorial or external awareness by means of tactual or visual exploration; such internal awareness, together with our consciousness of self-movement, yields us the specific knowledge which distinguishes it radically from the awareness and knowledge of all merely sensorially revealed existents, existents revealed only by means of specific external sensations. This inner self-feeling, this immediate and constant bodily awareness, conveyed by inner sensations or feelings, is that which stamps it among all other bodies, intimately and exclusively our individual possession; and on whose dim but permanent foil other transient feelings are more or less bright scintillations. The central sphere of self-feeling (*Körper-Fühlsphäre*) has been found to be the most extensive and most widely associated special province of the cerebral hemispheres.

In relation to such internal bodily experience it is important to remark that, though our actual aware-

ness forms only the single moment we call the **present**, and though such momentary awareness is centrally localized, it carries, nevertheless, with it, even in its mere organic composition, the consciousness of time and space relations. Our memory or fund of latent experience links present direct awareness to remembered conscious states, and to such as are expected to be experienced in the future. Our awareness of continuity and duration is due to stimulation and consequent conscious reverberation of our latent store of remembered experience. As regards our organic awareness of bodily expanse and form it involves in a primitive, yet definitive manner all space dimensions. A pain arising at any part of the surface of our body is instantly felt localized in space with astonishing precision, and this is the case also with our limbs, no matter in what position they may happen to be held at the time being, independently of being seen or touched. The hand, for instance, may be raised above the head, stretched out in front or in any other direction, and it is felt from within to occupy the definite position in space externally corroborated by touch and sight. A prick, moreover, on whatever part of it will be felt accurately localized in relation to our centralized apperception. All this time and space consciousness exists quite independently of the tactual and visual knowledge and corroboration eventually acquired by ourselves, and moreover verified by the touch and sight of outsiders. The feeling and apprehension of the definitely localized distance and direction of a pain or other sensation involves implicitly all spatial dimensions, and is evidently as elementary a mode of consciousness as the feeling or sensation which it accompanies. In fact, sensations are all felt as more or

less distinctly localized in implied space; cutaneous sensations quite definitely so. These are distinctly felt as specialized and accentuated points on the surface of the organic awareness of our body, and they occupy as such definite positions in this spatial awareness. How otherwise could we know where a sensation is being felt quite irrespective of tactual and visual exploration? And how could a pain or other sensation be felt localized at a definite spot on what had formerly been a limb, now amputated; and felt, moreover, in the spatial direction in which the amputated limb is delusively believed to be held?

These localized sensations are obviously consciously realized in what is perceived as the brain. The shifting of the spatial positions of a surface-sensation along with the movement of a limb must evidently be due to some change caused by the definite movement, and registered through a change in the central organ of space-perception. It cannot be exclusively due to sensations accompanying the movement, not only to sensations of muscular contraction, and to such as are arising during the movement of joints, as Professor James tries to prove. He says: "We indubitably localize the finger-tip at the successive points of its path, by means of the sensations which we receive from the joints." But let an arm be stretched out and made comfortably to rest. This performance is no doubt accompanied by sensations in the joints of the arm while being moved. But let the present position of the moved arm be forgotten for a while, the attention being otherwise occupied. All sensations that had originally accompanied the movement of the arm are no longer felt nor remembered. Yet a touch on any part of the arm, on the tip of one of its fingers, for

instance, is immediately felt as definitely localized; localized in an entirely different spatial position than it occupied before and during the movement of the arm. It is admitted that the brain, as organ of consciousness, is where the touch is actually felt, as definitely localized. The change from before to after the movement of the centrally felt position could not take place if some change in the position-sensing central organ had not been brought about concomitantly with the changed position of the arm. Surely it is not the nerves of the joint that give rise to the definitely localized feeling of touch on the skin of the motionless finger. This feeling is plainly aroused by stimulation of the same cutaneous nerves, that in case they had been stimulated in a former position would have given rise in the central organ to the feeling of that position. It follows that, as definite positions of the finger-tip are felt irrespective of joint sensation, all varying positions during its movement are thus felt. Still the joint sensations accompanying the movement are likewise felt definitely localized in the changing positions along the path of movement, and they reinforce thus the inner awareness of shifting positions during what is objectively perceived as movement of the arm and its fingers.

The important fact here is, that the same kind of sensation, a prick, for instance, on the same spot, is instantly and positively felt localized in whatever definite position in space the pricked spot may be objectively perceived to be situated. Consequently, the sensation being the same in every felt position, and also the stimulated spot on the skin, the immediate awareness of their occupying, nevertheless, entirely different positions can be due only to a definite change

in the central organ of space-consciousness. The inner awareness, at all times, of the position our members are occupying in space is, therefore, dependent on a definite change wrought in the neural structure of the central organ of space-consciousness during what is objectively perceived as the movement of these members. The central neural structure is here vitally mobile, and forms a sensitive medium whose constitution undergoes changes concomitant with and corresponding to bodily movements, enabling it thereby to convey immediate awareness of any assumed position of the members moved.

Consciously given as further means of knowledge, besides organic feelings, are preëminently what are called "special" or more particularly "external" sensations: sensations of touch, taste, smell, sight, and hearing. These are specific modes of sensibility found to be normally incited by definite modes of external stimulation, or, more cautiously expressed, incited by some compelling influence not emanating from the precipient's own being. Comparative anatomy and embryology teach that what we perceive as the ectoderm, or outside layer of the organism, has along its surface of contact with the environment been specialized into a system of sensory organs, attuned to special modes of stimulation. In the region of the head the ectodermic layer has been furthermore differentiated and specialized into what are known as preëminently the special organs of sense. It is by means of such specifically attuned sensibilities that our most distinct and varied experience accrues to us; the perceptual awareness, namely, of what is called the external world. We touch, taste, smell, see, and hear on incitement of our sensorial sensibilities, and recognize through

such reactive modes of sensation, the distinguishing characteristics of the inciting influences, being enabled thereby to apprehend their practical import to our being.

By sensorial sensibilities of the tactual and visual kind the inner organic awareness of our bodily form and its belongings becomes manifoldly corroborated and richly supplemented. The spatial blending of the inner organic and the outer sensorial awareness of our body renders the same a conscious possession apart from all other bodies. The sight and touch, for example, of what we call our own hand, being blended with congruent organic sensations, yields a certainty of personal possession not attaching to the sight and touch of its most perfect imitation, or to the hand of any other person. It is principally on this account that the other bodies, equally vividly perceived by touch and sight, are immediately apprehended as foreign entities. This is the case with all perceptual bodies, not felt and apprehended by means of inner or organic sensations. They are, in consequence, intuitively believed to belong to a world existing outside the percipient, whose stimulating influences incite in a definite way his perceptual awareness. These foreign influences intrude into consciousness with inevitable insistence, and cause the perceptual appearances to move and behave within the conscious content in ways of their own, felt to be independent of our individual volition. And without the least hesitation we believe such sensorially presented bodies, with their movements and changes to exist independently of our casually perceiving them, and we invariably act in accordance with this belief.

Nevertheless, it is quite certain that what we actu-

ally perceive as bodily existents consist out and out of nothing but the special kinds of conscious states called "percepts." They are modes of awareness somehow coerced into the form of definite bodily percepts by influences not exclusively emanating from our own being and its latent store of former experience.

The gradually apprehended and memorized generalities, differences, and similarities of the sensorially stimulated modes of awareness, and therewith the manifold connections among the stimulating influences thus revealed, go to form what may be called the objective part of our latent store of experience. This consists in an established range of comprehensive knowledge evincing itself consciously in an involuted system of conceptual representations, in which special concepts retain the signification of the common characteristics belonging to groups of perceptual particulars, whose similar traits they then representatively comprehend.

Purely subjective experience, such as is formed quite independently of external stimulation, and without direct reference to it; such wholly subjective information is composed only of those organic sensations that make up the inner awareness or uncomplicated self-feeling of our organism and its vital activities. It is this permanent groundwork of self-feeling that becomes casually objectively modified in specific ways by externally stimulated modes of sensorial awareness.

To us human individuals, however, the most important constituents of our conscious microcosm consist in the feelings, emotions, and volitions with which our being reacts upon external modes of affection in apprehension of their significance to our human wel-

fare. These feelings, emotions, and volitions emanate from organically preëstablished dispositions and abilities of our individual being. And their consciously experienced actuation forms the most intimately momentous part of our conscious life. They refer to what we like, desire, and strive for, and to what we dislike, eschew, and strive against. Our conscious microcosm, with its all-revealing moment of awareness, has in extra-conscious latency an inexhaustible fund of systematized inner and outer experience to draw upon. And the practically simultaneous presence of a wide reach of such experience in immediate awareness affords us, as direct and premonitory guidance, a microcosmic insight into nature and our life therein.

But where, after all, it must be asked, is to be found the extra-conscious matrix that harbors our latent experience? And by what means is it empowered to issue and reissue it into actual awareness in inexhaustible sequence, with life-long reinstatement? Also of what nature are the extra-conscious, foreign influences that compel and determine the perceptual awareness of nature? Upon the epistemological and ontological views thinkers are led to adopt regarding these inevitable questions hinges their conviction concerning the means and meaning of knowledge, and the nature of the reality of which it is the knowledge. In accordance with such conviction are molded social relations and ethical conduct.

V. THE EPISTEMOLOGICAL DILEMMA

THE fact that all awareness, all knowledge, all that is directly manifest in nature of things and events, consists solely of a variety of conscious states; this undeniable fact inclines thinkers, who have recognized it, to adopt straightway a purely ideal view of existence. For if everything we are actually aware of consists of such ideal stuff as conscious states are made of, what need, then, of any other kind of reality? What other kind of merely inferred reality can anyway stand its ground against actually and directly manifest conscious or ideal existence? The world as consisting of conscious or mental appearances is what is immediately, exclusively, and intimately revealed. All transcendent inference therefrom, all inference regarding the transcendent existence of extra-conscious, non-mental, non-ideal reality can be only hypothetical and problematic, nay, quite superfluous.

Such, generally, are the considerations that have induced even physicists in growing numbers to become convinced Idealists. And most philosophers since Berkeley have on the strength of the all-revealing, all-comprising nature of consciousness professed Idealism in some form. But, notwithstanding, it is surely an idealistic delusion to believe that nature can really and solely consist of the dream-like material we are directly conscious of, and which forms the conscious content. Even going to the extreme of discarding

entirely the epistemological problem by ignoring the solipsistic exclusiveness of individual consciousness, or by boldly assuming that conscious states exist, as such, altogether independently of any underlying subject or manifesting substance, even on such wholly untenable assumptions nature could not be constructed out of mere conscious or ideal phenomena. These are, manifestly, one and all in perpetual flux, and are utterly forceless and evanescent appearances. The futility of every attempt to construct any durable and consistent world out of such perishable material should at once be plainly evident. And it is to be hoped that such bootless, delusive occupation may soon be classed with *perpetuum mobile* constructions, and quadrature of the circle solutions.

In truth, no philosophy, not even extreme Phenomenalism, can succeed in evading realistic inferences, which transcend essentially what is consciously given. Some kind of enduring matrix, wherein past experience is abidingly preserved in extra-conscious latency, is always tacitly presupposed. For without the memory of past experience all coherency, all consistency of consciousness, and of the existence it reveals, would instantly dissolve into complete oblivion and nonentity. The tacit postulation of a matrix and emanating source of past experience amounts, however, to almost entirely begging the question of knowledge. For everything already acquired, and all original endowment of sensibility, percipiency, and apprehension rests evidently somehow potentially preexistent beyond the transient conscious appearances, ready on occasion to arise and to furnish the material and consistency of actual awareness. Clearly, a theory of knowledge is here indispensable to make sure of the existence and

nature of the extra-conscious matrix wherein all experience becomes latently preserved and systematized as ready-made knowledge, and whence it issues into apprehending awareness.

Idealistic world-constructions, though acknowledging only the real existence of mental or ideal modes, are forced to assume more or less openly some permanent, active principle that systematically elaborates and steadfastly underlies the random, forceless material which casually intrudes into awareness, and that apprehends it as consistent knowledge. To this assumed actuating, systematizing, and apprehending agency various names are given, such as soul, mind, ego, reason, intelligence, will, apperception, attention, habit, association, necessary connection; in fine, some postulated, power-endowed entity has here to be conceived as the efficient principle of synthetizing and apprehending cognition, in order that significant experience may be derived from the experiential confusion that attaches to what randomly and fractionally appears in time and space.

Now as Idealism can nowise dispense with realistic postulations of an extra-conscious nature, it devolves upon it to prove, what it has never yet succeeded in doing, that its assumption of the idealistic nature of the postulated efficient principle is truly valid; to prove that what we experience as conscious or mental states are, as such, latently contained, and that they issue into awareness, by force of the substantiality and activity of an agent which is itself of the same ideal nature as our conscious or mental experience; or, at least, of the nature of some constituent of it. For, undeniably, we know actually and positively no other kind of ideal or mental existence save that of the sundry modes of

awareness that constitute our individual conscious content.

What positive proof, then, can be brought forward, that some enduring, force-endowed, extra-conscious agent of a nature essentially identical with what we experience as manifestations of our conscious awareness; that such an ideal agent is in verity underlying, systematizing, actuating, and apprehending the forceless and evanescent play of conscious phenomena?

It is of the essence of Idealism to deny outright the existence of extra-conscious physical existents believed by common sense to compose what is called the external world. In its nominalistic mood it attributes permanency and efficiency to the sensorial elements of awareness, and seeks to construct by combinations of these ephemeral sensations the entire world of consciousness, declaring it to be the real world. Such fanciful handling of transitory elements of awareness results, at most, as with Berkeley, in self-rounded percepts, themselves mere transitory phenomena, nevertheless considered by him to be identical with real existence.

In its transcendental mood Idealism attributes permanency and efficiency to what it calls "thought," "reason," or "intelligence," meaning thereby a transphenomenal agent that creatively constitutes and knowingly apprehends an eternal system of ideas, in which all true reality is believed to consist. And such thought, reason, or intelligence is thus held to be identical with universal Being.

As already stated, Idealism of the sensorial or nominalistic kind necessarily presupposes beyond actual consciousness some preserving, memorizing, and issuing matrix of past experience, and a synthetizing power

which binds present and past experience into coherent knowledge. Of these most essential sustaining, actuating, and apprehending agencies it takes, however, no adequate epistemological account, giving them merely arbitrary names without proof or demonstration of the real existence of that which the name implies. Idealism of the intellectual or transcendental kind has, in its turn, for the sake of existential continuity and permanency, been led fictitiously to postulate an eternal, full-formed system of thought or totality of Being, of which individual knowledge is then declared to be only a more or less adequate re-cognition.

The knowledge of nominalistic or sensorial Idealism refers to nothing real in existence beyond the phenomenal play of individual consciousness, and with it its world vanishes from moment to moment into the unsubstantial void of pure Nihilism. The knowledge of transcendental or intellectual Idealism, on the other hand, never succeeds in assimilating or in emanating sensorial and perceptual awareness, failing thus to include and to recognize the essential significance of our most vivid, distinct, varied, and practically important experience. In measure as the conceptual thought of intellectual Idealism is made to serve in the interpretation of experience as an entity comprehending in its concentrating inclusiveness a more and more complete range of knowledge, but knowledge purified of its sensorial significance; in measure as it accomplishes this it then conceptually reveals not an intelligible world of complete and perfect being, but a Nihilism even more devoid of reality than that of sensorial Idealism. Pure thought, despoiled of sense-revealed material, has irretrievably lost all content and significance, as Kant recognized, and despite all that

post-Kantian Idealism has asserted to the contrary.

Conscious and rational comprehension of experience with its transcendence of time and space-limitations is only to be found in the all-revealing conscious content of our moment of actual awareness, which, being itself a mere transient phenomenon, must be wholly dependent for its subsistence on a permanent matrix of latently systematized and memorized knowledge. The task is to demonstrate the real existence of such a matrix. As, to conceptual thought, believed to be itself such a matrix, its function is to be representative of generalities, similarities, and differences obtaining between facts of outer and inner experience. You divest it of its reference to these positive manifestations in time and space, and it has therewith dropped its entire cognitive significance. All modes of cognition have exclusive reference to such experience as has accrued in time and space manifestations. A mere sensation may be thus already a cognitive fact of extensive subjective and objective significance. The awareness of a specific odor, for instance, a mere olfactory sensation, can involve as subjective sign the apprehension of near satisfaction in a definite manner of an organic need such as hunger. And as an objective sign it may involve at the same time recognition of the existence and near presence of a specific, extra-conscious object which will satisfy the organic need. The mere sensation serves here as a sign for an entire complex of inner and outer knowledge derived in the past and to be applied to what is to happen in the future.

Even so elementary a cognitive fact as here mentioned opens in an unsophisticated way the entire

epistemological problem. The specific sensation which serves here as a cognitive sign, signifying in internal experience the prospect of a definite mode of satisfaction of an organic need, implies the epistemological question of the seat of the sensation and its cognitive implications, the seat also of the organic need to be satisfied. And the same cognitive sign signifies in external experience a definite object of satisfaction, involving the epistemological question as to where this object has its real being, and in what its hunger-satisfying efficiency really consists. These are the genuine epistemological questions; the questions of the true import of knowledge involved in the experiential significance of conscious signs.

Now can pure Idealism in the remotest degree account for this fundamental and indubitable state of things? Can the organic need, which surely has to be allowed to be an urgent existential fact, can it be resolved into mere conceptual existence, or into nothing but its immediate conscious signs? And the object which is to serve as the hunger-satisfying existent, signalized by a mere sensation, and present as a mere percept, can it itself consist of this same percept? Can the organic need, the tremendously powerful vital craving of hunger, be appeased by the mere presentation of an ideal phenomenon, such as a percept assuredly is? Can any ideal or perceptual piece of bread, consisting of nothing but visual and tactual sensation, satisfy the craving of hunger, of whose reality as an organic need no sane person can doubt?

Such simple practical consideration, boldly faced by Berkeley, who felt logically compelled to assert the hunger-satisfying efficiency of his nevertheless "force-

less" perceptual "victuals"; such commonplace remarks are none too trivial to put to the rout pure Idealism of the loftiest kind. For the most exalted inner experience accrues to us likewise as the intellectualized conscious manifestation of organized needs and tendencies, such as the craving or desire for truth, for goodness, for beauty. And the satisfaction of these higher needs is likewise to be found in existents of the extra-conscious world, of which sensations, percepts, and thoughts are the cognitive signals. Percepts and thoughts, however beautiful and sublime as directly apprehended, are always aroused by, and are always significative of influences emanating from the extra-conscious existents that compose the real, trans-phenomenal macrocosm, of which our own being forms an integrant part. You annihilate this being's organic needs, which constitute its conative propensities or impulses; and you annihilate, furthermore, its fund of latent experience, that constitutes its cognitive wealth, and what import would be left to cognitive signs in direct awareness? What would, then, a sensation, a percept, a thought, a word, signify beyond its own appearance? They would obviously have lost their entire cognitive significance. And, on the other hand, you annihilate the source of sense-compelling influences, and with it all externally awakened cognitive signs, all actual and remembered sensations and perceptions, and the consequence would be that no organic need of any kind, no conative striving could find the least satisfaction.

These preliminary epistemological remarks amount here, however, only to intuitive assertions which, convincing as they may be to common sense, have to await more explicit and positive grounding before they can

have their validity scientifically established. For, undeniably, the assumption of any kind of existence beyond that immediately present as content of the moment of actual awareness is a mere inference, however insistent, which a sound epistemology has existentially to justify.

If the efforts of pure Idealism to transcend the phenomenal play of the individual's conscious content prove futile on critical examination, Materialism, on the other hand, loses at once its *raison d'être* from the simple fact that what it takes to be real, extra-conscious bodies are in truth only sense-woven percepts. No wonder, then, that such perceptual bodies, which are themselves only phenomenal constituents of the transitory conscious content, have no power to produce or to transform themselves into other constituents of consciousness, an assumption nevertheless implied in current physical explanations. The visual percept, for instance, called air vibration, how can it be the real stimulating agent of the auditory sensation called "sound"? A complex of visual sensations, which consciously constitutes air vibrations, can nowise influence a complex of auditory sensations. Both sensorial complexes are obviously constituents of one and the same forceless conscious content aroused by different modes of the same stimulating influence, and have as such not the least power of affecting each other.

It is only when the perceptual brain is wrongly taken to be something self-existing; namely, a functioning bodily existent outside consciousness; it is only then that there arises the insoluble, perennial puzzle, how such function of a material body can possibly produce, emanate, or transform itself into a conscious state. The central riddle of the Cartesians, of the physiologists,

the psycho-physicists; in fact, of all who believe in the dualism of "mind" and "matter"; the ancient standing riddle how body can possibly act on mind and mind on body, or how motion can produce sensation or sensation motion; this provokingly unyielding riddle finds its ready solution in the recognition that there exists no such thing as the matter and motion here postulated beyond consciousness; that both the supposed moving matter and the supposed feeling mind are alike groups of conscious phenomena which as such can nowise influence one another.

A conscious or ideal sign, say a certain sound, can nowise act upon a percept, say a perceptual dog. You cannot effectively whistle to an ideal dog you remember, or to a perceptual dog actually forming part of your conscious content and of that of any bystander. Nor is the sound heard by the real dog at all heard by the perceptual dog forming part of your conscious content; and the movements of the perceptual dog within your conscious content are no more the movements of the real dog than those perceived in a mirror.

Perceptual bodies, made up altogether of forceless conscious states, are clearly powerless to act upon other conscious states. The extended group of percepts which compose what we are visually and tactually aware of as our body, and the unextended group of conscious states which make up what is considered to be our mind; this entire complex of conscious states goes to form the conscious content of our moment of actual awareness, which is itself significant of the vast fund of gathered experience that rests latently and potentially organized in some extra-conscious matrix.

Materialism misconceives, no less than Idealism, the

real epistemological problem, and misinterprets therewith the true import of knowledge. The pending question in this connection, as generally conceived, is: What are the actual conditions that determine the striking difference obtaining between perceptual and conceptual awareness? This is the difference which has persistently led on the one side to Materialism, and on the other side to transcendental Idealism. Perceptual awareness seems to picture externally in time and space a world of bodily existents subsisting permanently beyond our senses and independent of being perceived. Conceptual awareness, on the contrary, seems to recognize inwardly a timeless and spaceless world of purely ideal subsistence. We have here an epistemological dilemma that has sorely perplexed ancient and modern thinkers. It gives rise to sundry momentous questions. How does past experience, evincing itself in comprehensive conceptual thought, come to be latently systematized and preserved? By what means does it then issue significantly into actual awareness? Of what kind of existents are externally compelled perceptual appearances representative signs of? And what do the two seemingly disparate modes of cognition, perception, and conception respectively signify to us human beings?

The constituents of our conscious content, our sole source of revelation seem as perceptual phenomena to point towards a universe of permanent, power-endowed existents subsisting beyond sensorial awareness. As conceptual phenomena they seem to point towards an extra-conscious matrix, wherein actual experience finds a retentive reception, and wherein past experience is systematically gathered and preserved, despite its having been merely casually, frag-

mentarily, and cursorily apprehended within actual awareness. These are transphenomenal, naturalistic implications intuitively inferred in contemplating the conscious content, which, however, might possibly be delusive, and have, therefore, to be scientifically verified by means of a valid theory of knowledge. Transcendental Idealism maintains, in fact, in opposition to them, that all cognition of what appears in time and space is only inadequate re-cognition of a supernatural, all-comprising content of timeless and spaceless reality.

To settle decisively this all-important contention pending between Naturalism and Idealism is the urgent task of a sound epistemology, in order that philosophical thought in its interpretation of nature may legitimately transcend the mere phenomenal world of individual consciousness, and arrive at truly significant knowledge concerning the universe and our life therein.

VI. THE EPISTEMOLOGICAL STANDPOINT

It is undeniable that the group of conscious states, organic, sensorial, and perceptual, which constitutes the direct awareness of what we call our body; that this direct bodily awareness consists of nothing but forceless, evanescent mental or ideal phenomena. We shut our eyes and the visual percept we call our body vanishes out of consciousness. We avoid encountering the definitely localized specific sensations of touch and resistance, which we likewise call our body, and this tactual body is also no more. We refrain from actuating sets of muscles, and what we call the different parts of our body, which by means of movement would have become clearly conscious as definitely localized, are now consciously non-existent, save vaguely as organic feelings and contact sensations. We go to sleep, undoubtedly a real occurrence in life not to be argued away, and the entire complex of diverse conscious states, which constitutes all we are aware of as our body, is then completely wiped out of existence.

This being quite evidently so, the all-important question arises here: whether this purely ideal body of ours, composed of nothing but diverse sets of casually emerging and vanishing conscious states, and being obviously the only body we are actually aware of as belonging to our own being; whether it is, as such, our real body, or veritable living organism; or whether, on the other hand, all these different conscious states, of which it is made up in actual awareness, are merely phenom-

enal signs, signaling in various ways the real presence and the real characteristics of a relatively permanent, extra-conscious existent?

This, surely, is the gist of the genuine epistemological question, so far as it concerns the real substantial existence of our body. Idealism is forced to maintain, either, that the sensorial and perceptual body, the only body we are actually aware of, is altogether an illusion of sense; or that we have really no other body save that constituted by conscious states; by mere sensations and percepts, as nominalistic Idealism is bold to assert, or that it is a purely thought-woven phenomenon, as is the settled persuasion of conceptual Idealism. And in order to account for the permanency of such an ideally constituted body during its absence in conscious awareness, Idealism has at times recourse to the same preposterous device which Leibnitz made use of for a similar purpose; recourse, namely, to the assumption of unconscious conscious states. For as regards the monads of Leibnitz, pure ideal beings such as Idealism believes us all to be, without their existence being hypothetically grounded in an enduring plenum of unconscious being, they, and we ourselves, would consist of nothing but a succession of conscious phenomena arising out of vacancy. To impart to such purely ideal monadic beings enduring subsistence, and an inexhaustible source of potential modes of consciousness, Leibnitz endowed them with a permanent fund of unconscious perceptions. But, surely, perceptions that are not conscious are clearly non-existent as such. And, besides, how can a being believed to consist of nothing but ideal activity, nevertheless contain in latency a permanent, world-comprising content?

Conscious states can, of course, not issue out of

nothingness. They must arise from a permanent, extra-conscious matrix. But just because the permanent matrix is evidently abiding in extra-conscious latency, it cannot be itself of conscious or ideal consistency; it cannot be composed of perceptions that are not perceived, or of mental phenomena of any kind that are of conscious consistency, but not consciously manifest. Virtually the same device for saving the permanency of the idealistically conceived body during its absence in conscious awareness, is its transference as a continued existent to the conscious content of an hypostasized universal consciousness. But here again all conscious activity of a universal intelligence can consist only of a succession of transitory conscious states. Such an intelligence must, therefore, no less than the monads of Leibnitz, have as sustaining source of its successive conscious states, an emanating extra-conscious matrix. And this leads consistently to the unconscious One or Absolute of Neo-Platonism, or to the likewise unconscious "Ungrund" of Schelling. Where, then, in these ineffable profundities of being is our idealistically conceived body to be found?

As regards the Absolute in the Spinozistic sense, it consistently leads to the Eleatic position. For it is of the essence of its being to be changeless, or not involved in the flux of time. Under this view, if our body is not held to be altogether an illusion of sense, it can at most be a changeless limiting mode of the Absolute's infinite attribute of extension. And if consciousness be at all allowed to the absolute, it could only consist of an eternal moment of all-comprising, changeless awareness, or an ever sustained *nunc stans* of conscious All-Being, which is the untenable Eleatic position over again.

In outright opposition of every kind of pure Idealism epistemological Naturalism, and with it common sense, believe emphatically in the real existence of a vitally organized bodily entity subsisting beyond consciousness, existentially independent of what is casually perceived or conceived, as the group of bodily percepts which at times forms part of our conscious content and of that of bystanders. It devolves upon Naturalism to prove, or clearly to demonstrate, that such an extra-conscious, relatively permanent entity is in fact signaled by the complex of fleeting conscious phenomena we call our body. Can we, then, epistemologically corroborate the common-sense conviction that what is perceived as our body, and with it what is perceived as the entire world figured before our senses; that this perceptual awareness is really signaling a realm of Being existing independently of being thus perceived or conceived?

It cannot be denied that all accurate knowledge we now possess of what we call our body has been laboriously acquired by means of scientific research, and nowise by mere philosophical contemplation or speculation. The vast array of biological facts, verifiable at all times by whatever competent investigator, has been collected by a host of close observers of sense-compelled percepts, and has not been excogitated by single philosophers from an ideal totality of Being conceptually hypostasized. The biological knowledge of our body is based on perceptual facts scrupulously ascertained by means of visual and tactual awareness, and not on thoughts intrinsically evolved or deduced from the nature of an assumed Absolute.

In this connection it is instructive to be reminded of what leading philosophers of modern times have,

as systematic thinkers, been logically constrained to teach regarding the constitution of our body. Descartes, as philosopher, believed it to be a complex geometrical figure, a mere special mode of his extended substance. Spinoza held it to be the extended aspect of a special unitary mode of combined thought and extension, these being the two particular attributes of the absolute substance which compose our world. Leibnitz taught that the body is composed of an aggregate (!) of inferior unextended (!) monads surrounding the central monad held to be exclusively the being, of which the outside monads form the body. Locke taught that the body is made up of what he called the primary qualities of things: extension, density, and movable form. Berkeley, that it is a percept flashed into awareness by the volitional fiat of the Deity. Hume, and with him all consistent Sensationalists and Associationists, that it consists of a conglomerate of vivid impressions and their remembered ideas. Kant, that it is a synthetic product of the understanding elaborated from sensorial appearances. Fichte, that it is the outcome of an unconscious act of the productive imagination consciously apprehended by the rational activity of which he believed the world-creating Ego to consist. Schelling in his system of Absolute Identity intuits the body to be a definite expression or potency of the objective or nature-pole of absolute Reason. Hegel that it forms part of the inadequate phenomenon of Reason, called nature. Herbart held it to be an apprehended specific mode of self-conserving reaction on the part of the monadic soul; a mode aroused by the disturbing influence of a definite constellation of the surrounding monadic "reals" or simple substances. Mill, that it is a

special group of possibilities of sensation. Lotze, that it consists of a multiplicity of real, hypersensible, unextended beings that display spatial force-manifestations in relation to other such beings.

In all this astounding miscellany of body-estranging conceptions, excogitated by foremost thinkers, common sense and natural science can nowise recognize what we minutely and intimately have learned to know as our body or organism, and as that of other living beings.

Yet who can follow the profound and subtle reasoning of these master-minds without having to admit the all but compelling force of their conclusions. These, however, are arrived at by the interpretation of thought and being, spirit and nature, mind and body, from speculative postulates or from inadequate experiential data, and without the indispensable aid of a sound epistemology.

The existence of enduring entities, believed by common sense to give rise to the casual awareness of our own and other bodies, seems to be strongly corroborated by the fact that entirely different sets of conscious states point each in its own way to such existence. The manifold organic sensations that make up the inward awareness of our body are supplemented by entirely different and diverse modes of vivid and definite sensorial awareness, tactual, visual, thermal, and so on. Moreover, the independent existence of such entity seemingly subsisting irrespective of the perceptual body casually and fractionally arising within our conscious content; the existence of such an extra-conscious existent is rendered all but certain by exact copies of our own perceptual body being at one and the same time forcibly aroused, with all its sensorial characteristics, as the percept of ever

so many percipients. Surely the rational explanation of such multifold and most specific coincidences of awareness in ourselves and in a number of other percipients, is clearly, that one and the same extra-conscious, sense-compelling existent is arousing a specific perceptual and representative awareness in the different percipients.

Still, despite all this ample and convincing evidence, it remains open to deny altogether the extra-conscious existence of other percipient beings; for such existence is, in fact, inferred solely from our own perceptual awareness of bodies and their motions, which we instinctively or intuitively believe to belong to other beings. Pure Idealism, however, emphatically denies the existence of such extra-conscious, sense-revealed beings. Such denial leaves nothing present in the world, save one single conscious content, whose including moment of awareness would, then, be itself the One-and-All. This, indeed, is the solipsistic position, from which pure Idealism cannot consistently escape. For, on the one hand, the individual's perceptual awareness signifies to such Idealism nothing beyond itself; and his conceptual awareness, on the other hand, reveals nothing concerning the assumed intelligible or noumenal world. It is clear, then, that in pure Idealism the perceiving and thinking individual remains as completely shut up within himself as is avowedly the case with the monads of Leibnitz; nay, pure Idealism, which can consistently admit no existence but the conscious content itself, is nowise justified in assuming the existence of any kind of perceiving and thinking subject. Consequently, Leibnitz made his monads consist of pure mental activity, inconsistently endowing them, nevertheless, with unlimited potentiality of predetermined thought.

As taught by actual experience, there is no other way of gaining knowledge of the existence of other beings except by means of perceptual awareness. And if such transcendent significance of perceptual awareness is denied, then this denial carries with it that of the existence of other beings in toto. This, indeed, is the consistent outcome of pure Idealism. The straits to which it finds itself reduced in its attempt to penetrate beyond the phenomenal appearances of individual consciousness into the realm of permanent, transphenomenal reality, urges it to fancifully deify the solipsistic consciousness. Individual consciousness, the only consciousness we have any direct knowledge of, is then speculatively transferred to a transphenomenal sphere, and there expanded into universal consciousness. Such fanciful, inadmissible transsubstantiation of individual consciousness cannot be rendered acceptable by the interposition of a plurality of ideal beings or monads between the actual solipsistic and the assumed universal consciousness. A single monad of Leibnitz, preëminently his own central monad, constitutes virtually the One-and-All. For, as Leibnitz himself maintains, if all other monads but one were annihilated, this one remaining monad would contain within itself the whole infinity of existence. A monad is conceived as consisting of successive moments of more or less distinct awareness, arising with fatalistic necessity, uninfluenced by anything external to itself. Now such a solipsistic monad, which rigorously excludes all outside influences, cannot possibly be aware of the existence of other beings. It is, therefore, an altogether arbitrary assumption on the part of the central monad of Leibnitz, or of any exclusively solipsistic consciousness, to posit outside of itself

a plurality of other monads. The futility of attempting to construct the universe out of purely ideal, unextended beings is strikingly exemplified in the Monadology of the great Leibnitz, and also in that of Herbart and his followers. The idealistic Pluralists vainly labor to construct bodies, which are extended things, out of monadistic beings, which are unextended phantoms; and vainly, above all, to derive a plurality of separate beings from the exclusively intrinsic manifestations of a unitary individual consciousness. The aggregation of ever so many unextended beings can never constitute the least extended thing, or even the least extended percept. Nor can the solipsistic awareness of a simple unextended, indivisible unit perceive a multiplicity of other units. A central monad cannot possibly have an extended body, as Leibnitz nevertheless maintains, and one consisting of a vast number of unextended inferior monads. And if it really had such a body miraculously extended and miraculously attached to it, it could neither be in the least influenced by it, nor indeed ever become aware of it.

A monad, by dint of its unlimited endowment of potential or implicit consciousness, which by necessitated explicit evolution will ultimately be rendered identical with universal consciousness, — such a monad is really the Absolute in an unconscious state. And here we reach again the world-view of Plotinus, Boehme, and Schelling; in fact that of all thinkers who posit a something which implicitly contains all modes of being and becoming. Transcendental Idealism stands for the progressive revelation of preëxisting perfection; Naturalism for the laboriously progressive new-creation of higher and higher forms of being.

It is the essential task of epistemology, a task not

to be evaded, to show how individual consciousness can be legitimately transcended; and, therewith, how to become rightfully convinced of the existence of other beings on the strength of data yielded by the solipsistic conscious content. This, in fact, is the crucial test of a correct epistemology, which no system of pure Idealism has ever been able to come up to. And here, under the existence of other beings, is included not only that of human and other natural beings, the philosophers among the rest; but also that of the absolute Being or the universal Intelligence of philosophical systems. The real permanent existence of the latter is speculatively posited, either as an innate revelation of conceptual awareness, or as a necessary inference from perceptual awareness; either by force of ontological intuition, or by that of cosmological and teleological arguments. The alleged justification of the ontological assumption, an assumption virtually underlying also cosmological and teleological views, was conclusively shown by Kant to be invalid. Restrained by his scrupulous intellectual integrity he failed to find the *ens realissimum* and *perfectissimum* given in the conceptions and perceptions of the conscious content. For the mere conception of a transcendent entity, the mere conception here of a supreme transcendent being, nowise includes or insures its real existence.

The expansion and substantializing of the phenomenal and fractionally transient conscious content of the individual thinker into an eternal, all-comprising possession of a perfect universal Being, is surely the outcome of an exorbitantly bold flight of productive imagination, unsupported by any epistemological justification. Epistemological restraints are here com-

pletely ignored or openly discarded as irrelevant. Schelling, who had pondered Kant's theory of knowledge, and who keenly felt the rational impulse to transcend the solipsistic position of Fichte, confessed that this could not be effected by the ordinary modes of thinking, but only in the manner of Plotinus, by "intellectual intuition" and "the innate longing that senses the One"; consequently, by faculties with which we have to imagine ourselves specially endowed for the purpose of miraculously transubstantializing data of our transient consciousness into universal reality. Ultimately Schelling arrived quite consistently at the final goal of the Neo-Platonic way of thinking. For Being, consisting with him in nothing but the act of thinking, cannot possibly be itself the all-comprising Absolute. Its thoughts, consecutively arising in the act of thinking, cannot arise out of Nothingness. They must therefore be implicitly contained in an unconscious matrix, in which they are simultaneously brooding in undifferentiated latency. And it is this implicit content of the Absolute which becomes then explicitly revealed to consciousness as the manifold modes of nature and spirit. From the biological standpoint it may be incidentally remarked, that the ontogenetic evolution of body and mind from a unitary unconscious germ serves as actually given prototype for the "intellectual intuition" of such transcendent speculations. Such intellectual intuition is mostly unconsciously grounded in facts of vitality and organization.

No doubt Schelling is right when he maintains that the entire potential or implicit content of knowledge, which becomes consecutively conscious to us, must dwell simultaneously and systematically secured in unconscious latency. But where is this permanent,

all-comprising matrix of conscious experience really to be found? And when found it will, after all, turn out to be only the matrix or "Ungrund" of our own individual awareness, and not that of a universal consciousness.

Surely, a less fanciful and more scientific way of escape from pure Solipsism than that of Transcendental Idealism has to be discovered. Idealistic thinking debars itself from reaching self-transcendent reality on the perceptual side. The cosmological and teleological arguments, the most weighty and insistent considerations concerning the self-transcendency of individual consciousness, can have no meaning for a pure Idealist. For he cannot consistently admit that his perceptual awareness of the world signalizes anything beyond itself, that his percepts are revealing the existence and characteristics of a transphenomenal cosmos. This impotence of pure Idealism to reach transcendent existence on the perceptual side implies, as already stated, the denial of the self-existence of other human beings. For it is undeniable that the awareness of what we call other human beings accrues to us solely as a sense-derived perceptual appearance, as something seen, heard, and felt. Consequently, if these perceptual appearances do not directly and truly reveal the presence of beings having their real existence outside the percipient's own awareness, then the common-sense inference that such beings really exist can be but a delusion of the solipsistic consciousness. It has, indeed, ever been a cardinal tenet of pure Idealism that the sense-revealed world, as something externally and independently subsisting, is an illusive phantasmagoria. The solipsistic thinker, being himself in his idealistic view a purely ideal being, can no more trans-

ceed his own consciousness than one of the monads of Leibnitz. It was essentially this very consideration which led Kant in his antecritical period to agree with Malebranche. In his despair of reaching the trans-phenomenal reality of things on the perceptual side, he assented to the mystical dictum of the philosophizing theologian, that we see everything in God. After his vain effort to reconcile the diverse functions of reason and sense, he rather reluctantly exclaims: "*Nempe nos omnia intueri in Deo.*"

After having now sufficiently shown that pure Idealism cannot consistently admit the independent self-existence of other human beings; nor, indeed, of any individual subject of the solipsistic consciousness, it is superfluous to expose in detail the sundry devices used to escape the glaring absurdity that must adhere to a system of thought which involves so monstrous an outcome.

There can obtain no greater contrast of existence than that actually found between the fleeting phenomena that constitute our all-revealing conscious content, and the permanent, all-comprising, extra-conscious matrix, whence issues into actual awareness in unbroken sequence the panoramic revelation of nature, conveyed in ever-changing kaleidoscopic combinations of sensations, perceptions, thoughts, feelings, cravings, and emotions. Such a matrix must be in all verity a genuine substance, possessing the essential properties with which advanced philosophical thinking has been led to endow the inevitable notion of substantiality; a notion that alone rescues our world interpretation from complete collapse into the abyss of idealistic Nihilism.

Within the substantial matrix of the conscious

content must be latently and implicitly comprised the entire system of knowledge that becomes explicitly revealed in the medium of transient conscious phenomena. And as these are reissued over and over again in definite combinations, and are recognized as past experience, their source must, despite continual conscious outflow and expenditure of its implicit content, nevertheless, *retain its identical totality of being unimpaired. And this abiding identity amid inexhaustible change and expenditure constitutes the supreme unsolved riddle of the philosophical interpretation of nature.*

From the abstract notion of Substance, identity amid change can nowise be logically deduced. It is logically unintelligible why and how a permanent totality of Being comes explicitly and consciously to reveal its latent, implicit, extra-conscious content. And it is still less logically intelligible, how despite such constant expenditure it preserves its own identity intact. Other experientially implied properties of the matrix of consciousness can likewise not be logically deduced. As the latent storehouse of gathered experience the permanent matrix has to appropriate, from the fleeting conscious phenomena in lapsing and obliterating time, abiding traces of their presence and characteristics, in order to constitute the latent system of potential knowledge known as memory. This is clearly a creative process taking place in extra-conscious existence, which can be accounted for by no logical evolution.

Transcendental Idealism has in none of its attempts succeeded in demonstrating the real existence and necessary endowments of the matrix of consciousness. This can be accomplished only by aid of a naturalistic

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epistemology. Ignoring altogether the paramount importance of perceptual awareness, the attitude of transcendental Idealism towards Naturalism has consisted simply in pointing out the logical flaws in the working theories of investigators, who with unbiased zeal are studying the positive, sense-revealed facts of creative nature. By such criticism of the mere interpretation of what is actually revealed, conceptual thinkers seek to negate and push aside the fundamental importance and transphenomenal reality of that which makes itself perceptually known with preëminent vividness and minuteness. Such introspective Idealists, emboldened by their critical exploits, feel competent to declare perceptual awareness to be a mere shadowy, illusive apparition darkening spiritual insight. Yet all ideal visions of the "productive imagination" borrow their content solely from what is actually experienced in direct awareness, among whose conceptual ideas the Idealist can find neither his own being nor that of other existents. In its eagerness to make direct philosophical connection with a preconceived sphere of purely ideal or spiritual subsistence, transcendental Idealism turns short-sightedly away from Naturalism, the only true avenue towards transphenomenal existence. It fantastically luxuriates in the belief that with its logical formulas and dialectic maneuvers, utterly sterile if not fertilized by actual experience, it can conceptually evolve reality and effectively dispel perceptually revealed existence. What other revelation of the ceaseless formative workings of universal creation do we possess save that which reaches us, however inadequately, through our sensibilities, and which is then assimilated and transformed into permanent and systematized

experience, not within the transitory play of the conscious content, not in the domain of fleeting ideas, but in the extra-conscious organized and organizing depths of our real being?

Pure Idealism having proved wholly inadequate to transcend individual consciousness, wholly at a loss to reach true reality within the panoramic play of fleeting modes of awareness, it devolves upon naturalistic epistemology scientifically to establish the truth of our common-sense conviction; the conviction that a permanent, sense-revealed macrocosm exists independent of the perceptual awareness casually signaling its presence. Such epistemological corroboration, of what we are all instinctively and practically compelled to believe and to act upon, should receive more serious attention from professional philosophers than they have hitherto been inclined to give to it. Pure Idealism and psycho-physical Parallelism have become the settled views or provisional theories of most students who are occupying themselves with philosophical questions. The fact should no longer be overlooked or ignored that no idealistic thinker, not even Kant, with his transcendental Idealism, who labored with lifelong assiduity to rationally transcend individual consciousness; that no thinker has ever made legitimate headway with the impossible task of finding permanent reality in anything possessing the ideal nature of our mental modes, of our modes of actual awareness, the only mental or ideal modes we are at all cognizant of.

A pure Idealist cannot — as has been amply shown, and has to be insisted upon as a cardinal point — in any manner account for the way by which the existence of other human beings becomes revealed. For

he denies the self-transcending significance of perceptual awareness, the only direct and actual awareness we have of them. He cannot, therefore, consistently admit their real existence, or indeed his own substantial existence, much less the existence of universal Being. As a pure Idealist he cannot prove that what appears in his conscious content signifies anything beyond itself. He cannot legitimately hold any group of percepts or any involution of concepts, arising within the microcosmic play of awareness to be aught but transient, evanescent phenomena. In fine, pure Idealism of any kind involves inextricably outright phenomenal Nihilism.

This being so, it has now to be shown that with the help of a naturalistic epistemology the real transphenomenal existence of other human beings, and with it the existence of our own individual being, and of that of other perceptible things, can be satisfactorily reached as rational and legitimate inference on the perceptual side of actual awareness. Naturalists, no longer satisfied with materialistic views, have lately become convinced that their interpretation of natural phenomena has indispensably to be grounded on a sound theory of knowledge, and this is the task here attempted.

When the epistemological demonstration of the transphenomenal existence of what is signalized in perceptual awareness was here entered upon on a former occasion, we found ourselves estopped by the crucial question concerning the real existence of other human beings as independently subsisting percipients, who as such would then conclusively corroborate the extra-conscious significance of our individual percepts. It is undeniable that the real being of such percipients cannot be found among the ideal modes of our conscious-

ness, through which they make their appearance in actual awareness. For this reason pure Idealism can nowise consistently admit their self-existence. Yet, despite idealistic consistency, no one, not the Idealist himself, seriously doubts that their perceptual awareness signalizes their real, extra-conscious existence. And no one can seriously doubt that it is his own real being which becomes revealed to himself by means of tactual, visual, and other modes of sensorial affection, and which he most intimately knows to be his own body. It is a positive fact, that we base our unhesitating, direct recognition of, and our absolute practical belief in the real existence of other human beings, entirely and solely on our perceptual revelation of their presence. And, on the other hand, we unquestionably accept as valid their perceptual recognition of our own being, and consequently also their perceptual corroboration of the transphenomenal meaning of percepts which we believe to signalize real, extra-conscious existents. Of course, all this is epistemological inference from the compelled presence of our percepts. And, thus far, our epistemological conclusions rest on what may be called circumstantial evidence.

Let us see how far such evidence will bring us. I feel, for instance, by means of organic sensations directly in a definite spatial position what is called my great toe. I feel it again, indirectly but even more distinctly as a resistant form, when I tactually explore the organically felt toe. And by means of visual sensations I realize for a third time the same existent, occupying the same place. Furthermore, quite irrespective and independent of these three modes of my own awareness, any outsider can consciously recognize

the same object at the same spot, by means of his visual, and also by means of his tactual sensations. Surely, these many different modes of casual awareness, realizable at any time, signifying in sundry ways one and the same inevitably inferred existent, imply the actual presence of one and the same permanent entity compelling conscious awareness in these sundry ways and in sundry percipients. And how can an outsider's visual and tactual percept which he calls my great toe, be my real great toe? How can something forming part of his evanescent conscious content be something permanently belonging to me? And my own sensorial awareness of my great toe, duplicating that of the outside beholder, stands evidently in the same merely signalizing relation to my real great toe, as his perceptual awareness of it. The conclusion cannot be avoided, that one and the same real, permanent, extra-conscious existent arouses percepts which signalize its presence and characteristics in as many percipients as may behold it, myself included. Here, in order to fortify the argument, the real existence of other percipients is assumed on the strength of its all but universal admission. But the epistemological proof of such existence, without which the idealistic ghost would not be completely exorcised, shall be presently forthcoming.

When, let us say, the percept called a stick is forcibly aroused in me, and I break the stick in two, is it the perceptual stick I have really broken? Or is it not rather a permanent, extra-conscious existent that I have been breaking? The signalizing percept vanishes as soon as I shut my eyes or turn away. But henceforth, not only in myself, but in any other beholder, a percept representing the two pieces of the stick, instead

of the former unbroken stick, will under appropriate sensorial conditions be invariably aroused.

Again, let there be simultaneously present within the conscious content the percept called "lead" in contact with the percept called "fire." The percept lead changes soon visibly from what is called a solid into what is called a liquid. Now was it here the perceptual or ideal lead that has actually melted, and was it the influence of the perceptual ideal fire that caused it to melt? Or was not rather the perceptual change a mere sensorially awakened sign of what really took place between extra-conscious power-endowed modes of existence?

When you draw on paper the plan of a house you have ideally conceived, and have it then actually built by a number of masons and carpenters, and you afterwards behold the ideally conceived house solidly erected in brick and mortar, and move into it with your family; have all these events taken place in the sphere of pure ideality, which really means as mere mental phenomena within your own consciousness? And if so extravagant a theory, based on the denial of the transphenomenal significance of percepts, can find no rational support, then all those occurrences must inevitably have taken place in an extra-conscious sphere of permanent existence; and your casual perceptual awareness of it, which can have accrued to you solely through sensorial channels, has merely fitfully and fractionally signalized what has really happened quite independently of your perceiving it. And what you have perceived was certainly not anything taking place in the ideal consciousness of ideal masons and carpenters.

That our conscious awareness of time and space is

purely subjective, purely our own individual modes of awareness, is an indisputable fact. Our subjective consciousness of time, occurring in the moment of awareness we call the "present," is entirely dependent on what we call our "memory." If we did not remember in succeeding moments what had occurred in preceding moments we could have no time-consciousness. Our space consciousness forms no less part of our moment of actual awareness. Our visual space is a perceptual phenomenon consisting of luminous extension with definite determinations of shaded and colored forms. Our consciousness of tactual space consists of a definite series of remembered feelings of resistance and movement.

Idealists can acknowledge no other existence of time and space than that subjectively experienced. Yet it is obvious that to subjective time and space there corresponds an objective, extra-conscious prototype of time and space, to which subjective consciousness has become phyletically attuned. This fact is positively demonstrated by the congruent objective correspondence of the time and space consciousnesses of all beings endowed with sensorial sensibilities. How otherwise could be explained, for instance, the appointed meeting of whatever number of persons at a definite time in a definite locality? Though each person is exclusively guided by his subjective time and space consciousness, yet all these separate consciousnesses could not accurately coincide and guide their respective bearers to reach the same place at the same time, unless they were congruently attuned to one and the same objective, extra-conscious time and space world. When flies are attracted by scent from afar to one and the same spot where I see a carcass lying, this one spot

of space is surely not anything that exists exclusively and separately in the many consciousnesses of the flies and of myself. Evidently something emanating from the objective spot has affected the sense of smell of the widely dispersed individuals, drawing them all to the same spot as distinguished from all other spots in the wide world. And surely these many flies have not come to swarm round the spot which exclusively forms part of my own subjective space consciousness, which consciousness includes the perceived carcass and the perceived flies.

Idealists can offer no explanation for these constantly experienced attunements of individual facts of separate consciousnesses, serving as reliable guides in the attainment of one and the same objective goal. In order to carry their point, they have to deny the existence of a plurality of perceptible individuals, declaring it to be an illusion of sense, to which all too absurd extremity they actually find themselves driven.

These obvious commonplace considerations, practically admitted by every one, are, one would think, sufficiently decisive to expose the utter invalidity of pure Idealism, and render certain the existence of a real, extra-conscious universe, where all creative and constructive work is being carried on. But, as pure Idealism has for various reasons gained such firm hold, not only upon speculative philosophers, but also upon scientific thinkers, it will be well to enforce the demonstration of its insufficiency by still stronger evidence. It is an undeniable fact that you perceive what you call other human beings solely by means of sensorial affections aroused in you by agencies over which you have no essential control. You feel compelled to perceive most distinctly the colored and shaded forms you

instinctively take to represent other human beings. And you confirm and strengthen this belief by means of tactual and auditory sensations, seemingly accruing to you from the presence of these beings. You have to admit that without these compelled sensorial impressions you would be wholly unconscious of their presence and characteristics. If you were blind, and did not hear or touch me, my presence would be non-existent for you. In fact, without sensorial impressions the entire perceptible world, which now undeniably forms part of your conscious content, would be non-existent for you, as it would be for all beings devoid of sensorial sensibilities.

Surely, the non-existence of the perceptual or so-called external world within the conscious content, in the absence of sensorial impressions, is a positive fact that no argument can spirit away. Study the life-history of deaf and blind persons, and though the most fundamental sense, that of touch, is left them, they are found not only to have no other consciousness of what is called the external world save that derived from primitive touch; but, moreover, they remain idiotic, with only rudimentary intelligence, unless it be laboriously awakened in its potential innate matrix by means of linguistic teaching, inculcating the rational import of the tactual linguistic signs.

To unsophisticated common sense it must seem inconceivable how transcendental Idealism can come completely to ignore or contemptuously to slight the essential and altogether indispensable part played by sensorial impressions in the formation of ideas, notions, or concepts; and this in order to deduce experience and knowledge ratiocinatively as derived from partial conceptual recognition of an eternally complete sys-

tem of ideas constituting an hypostasized absolute Being. The strength of the position of transcendental Idealism as a genuine philosophical doctrine, when not, as usual, adulterated with irrelevant theological pre-conceptions, lies in the fact that in the adult state our conscious content may actually issue into awareness as ready-made, systematized knowledge, in the absence of casual sensorial impressions received at the time being. The decisive question here is, Whence does it arise? Where is the real matrix of this ready-made knowledge to be found? How has it been originally acquired? Its source must evidently transcend in its permanent, all-comprising nature the ephemeral, time-scattered conscious phenomena that flow from it without exhausting its phenomena-emitting capacity or impairing its identity. *It must combine within itself the rationally inferred properties of Substance or Being, with the seemingly incompatible experiential fact of ceaseless becoming.*

The quest after this necessarily inferred matrix of all-revealing consciousness constitutes the principal task of philosophy. For it is this paradoxical substance or matrix of consciousness, identically abiding yet ever spending itself in conscious outflow, that all epistemology is really in search of. That it cannot be found in an hypostasized Absolute has been clearly shown. Consequently, the epistemological search has to proceed on the naturalistic track.

When held to be inferred from experiential data, the existence of an Absolute cannot be rightly used vice versa as preëxisting ground, from which have to be deduced the very same experiential data upon which its own hypothetical existence was founded. And when not inferred from experiential data, then its

existence must be declared to be an innately or transcendently revealed idea, which assertion has proved to be philosophically inadmissible.

In further decisive corroboration of naturalistic Realism is to be brought forward the indisputable fact, that, if the other human beings, instinctively believed to exist independently of being perceived, and whose existence as such pure Idealism has consistently to deny; if these other human beings were of pure ideal consistency, as Transcendentalists declare them to be, they would then be wholly invisible, intangible, and inaudible, in fact absolutely non-existent to you or me. For it is quite certain that everything which constitutes their ideal nature, sensations, perceptions, thoughts, feelings, cravings, and emotions; that whatever composes their own ideal being can neither be seen nor touched nor heard.

Consequently, and this is of paramount importance, if other human beings subsist as entities not having their existence solely in your own conscious content, then that which is perceptible of them, that which is signalized by your visual, tactual, and auditory perceptions, the only direct awareness you have of them, must necessarily consist of something differing radically from what is considered to be ideal. That which has power to affect your sensorial sensibilities, and arouse in you the definite compulsory percepts representing other human beings, must be something incomparably more permanent and real than the mere fleeting mental phenomena that constitute your own visual, tactual, and auditory awareness, and, likewise the consciousness or ideal nature of the other perceived human beings. Whatever ideal endowments these other human beings possess, they can nowise affect your

sensorial sensibilities. It is certainly not their ideal endowments that you see, touch, and hear. This argument proves, that, if other human beings really exist outside your own conscious content, they must be relatively permanent, power-endowed entities, whose non-ideal nature forces its presence and characteristics upon you, by affecting in specific ways your sensorial sensibilities. And as to their ideal endowments, you apprehend these solely by means of sensorial signs interpreted in accordance with your own corresponding ideal endowments.

Deny the independent, non-ideal consistency of other human beings, and what you take to be such must then consist exclusively of your own phenomenal and evanescent percepts, either flashed upon you by a divine fiat, as Berkeley believed; or they must arise out of nothingness, as is the consistent outcome of Hume's and his followers pure Phenomenalism; or they can be only unaccountably called forth from the depths of your unconscious Ego, as Fichte and Leibnitz maintained.

These are the two alternatives: either the other human beings, and with them all other things, are only your own solipsistic perceptual phantoms; or they are enduring, force-endowed, extra-conscious beings, subsisting independently of your casually perceiving them. No verdict of the purely conceptual order has here a right to intrude. For, as the entire actual awareness of other human beings consists wholly and undeniably of perceptual appearances, the conceptual evolutions with which transcendental Idealism exclusively operates are here entirely debarred. Conceptual awareness is utterly impotent to evolve the perceptual appearances which alone constitute the actual awareness

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of what are called other human beings and other things.

It would seem that no sane person realizing this inevitable epistemological dilemma, however forcibly urged by the logical implications of his preadopted conceptual premises, can hesitate in his choice between the two alternatives offering themselves for selection in connection with this supreme epistemological question. Either pure ideal Solipsism or naturalistic Realism,

VII. NATURALISTIC IMPLICATIONS

It has been shown that neither sensualistic nor transcendental Idealism; nor indeed any kind of pure Idealism, has ever found or can ever find a way legitimately to escape and to transcend the Phenomenalism, Nonsubstantialism, and Nihilism necessarily involved in taking the forceless, evanescent mental or ideal modes composing the conscious content to possess self-subsisting reality. The genuine epistemological problem comes to light with the recognition of the out and out phenomenality of all conscious awareness. And the task was then to demonstrate, on the one hand, the existence of a permanent matrix, whence the evanescent conscious content arises; and, on the other hand, to establish the transphenomenal significance of our conscious states or modes of awareness. In opposition to all pure Idealism it has been epistemologically shown that the permanent matrix, whence the evanescent conscious content issues into awareness, must be of a nature differing *toto genere* from anything forming part of the conscious content itself; that the conscious states called "cognitions" signify experientially accrued and accruing knowledge; and that the vivid and definite modes of cognition called "sense-perceptions" signify directly extra-conscious, power-endowed existents, which make their presence and characteristics known by affecting in specific ways our sundry modes of sensibility.

It follows that what we perceive as human beings, ourselves included, together with all other perceptual

objects; that such direct percepts represent in all verity extra-conscious existents, whose presence and characteristics are thus perceptually revealed to percipient beholders. And thereby was disproved the monstrous idealistic contention of pure Sensualism that human beings and other perceptible existents exist merely as certain sensorial appearances within the beholder's own perceptual awareness; or, as other modes of Idealism maintain, that they consist, at best, of some sort of ideal substance or mind-stuff, either as self-subsisting monads, or as forming part of an hypothesized Absolute or universal Intelligence. It is quite certain, however, that such ideally constituted beings, of whatever kind, could be neither seen nor touched nor heard, and would therefore be non-existent to one another.

These considerations render evident, that, though the immediate object of physical, anatomical, and physiological research consists of the investigator's own percepts, yet it is preëminently true that the essential use and office of these casual and vanishing percepts is to vividly and minutely signalize the presence, characteristics, and activities of real enduring existents, which are affecting in specific ways the observer's sensibilities. The reason why this obvious epistemological state of things, though generally straightway assumed, has, despite endless controversy and discussion, remained philosophically obscure, undecided, and contradicted, is chiefly due to the non-recognition of the complete forceless and evanescent consistency of all conscious states, and of what this utter phenomenality of consciousness consistently implies. Mere perceptual or conceptual constituents of the fleeting conscious content have by Idealism been

substantialized into fictitious permanency as real constituents of the universe, with no other speculative result than the utter dissipation and volatilization of true reality.

From the standpoint of consistent sensualistic Idealism science would be impossible. For there is no way of staying and handling the constant flux of conscious appearances as such. They can nowise be weighed, measured, placed under the microscope and photographed. This holds good even if it were true that the continued presence of the perceptual appearances under investigation could, whenever required, be secured by some idealistic means regardless of direct sense-stimulation. A world consisting of nothing but dreamlike apparitions could never constitute the steadfast, verifiable objects so definitely investigated by natural science; nor could it constitute the scientist himself.

To consistent transcendental Idealism, on the other hand, perceptual awareness, and with it perceptual science, is altogether meaningless, however ingeniously it seeks to dodge this absurd outcome of its system of ideas. For it really involves the utter emptiness and nothingness of its fancied intelligible world. It can only pretend to deal with science of any kind, and, indeed, with aught that concerns our known world, by surreptitiously including in its conceptual maneuverings directly or by implication all manner of perceptual and other experiential data. There should remain no shadow of a doubt as to the naturalistic bearings of our perceptual awareness. It is through interaction with the perceptible world that life originates, is sustained, and organically develops; that our instinctive needs find their satisfaction, and our

volition its practical, social, and ethical fulfillment; that our feelings are incited and our emotions called forth; that physical science obtains its object of research, and psychical science its transphenomenal foundation. Bereft of all perceptual influx, and its naturalistic bearings, what content would there be left to the purely ideal sphere? The fact is, that body and mind we are molded in correspondence to what constitutes our environment, in interaction with which our life is sustained and carried on. The actual source of perceptual awareness, or rather of definite percepts, is conclusively proved by persons whose senses are deficient. The blind and deaf, and eminently the deaf and blind, demonstrate positively, that, despite their innate endowments, their consciousness is devoid of the percepts normally awakened through external stimulation of the senses of which they are deprived; and consequently also devoid of the concepts or ideas representing them. Surely this obvious and undeniable state of things alone suffices to prove the primacy of perceptual over conceptual cognition. But mere conceptual thinking has become so inveterate a habit in scholastic circles, where a *flatus vocis* counts for more than an actual fact of nature, that it will prove a hard task to supersede in philosophical conviction this sterile and facile predilection.

When you perceive your friend, when you see, hear, and touch him, and your philosophy teaches you, that this apparent friend consists really of nothing but these your own sensations and percepts; that it is a delusion to believe that what you thus perceive has any self-existence, any real being outside your own conscious content; surely you must then begin seriously to suspect that your philosophy has entangled your

thought in a distracting maze, and that it is high time to seek for a clew by which you can thread your way back to the sane outlook of common sense. It is indeed certain that your entire direct awareness of your friend consists of perceptual phenomena forming part of your own conscious content. But it is just as certain that your friend does not himself consist of these casual and evanescent conscious states of yours. And it is also just as certain that you do not perceive, that you do not see, hear, and touch your friend's mental or ideal being; that this is revealed to you in a roundabout way by means of sensorial signs. Consequently and irrefragably, if your friend really consisted of nothing but such ideal or mind-stuff as declared by pure Idealism; his being would, as already insisted upon, be wholly imperceptible. You could never become aware of his presence. It is, however, a positive fact not to be argued away, that you do perceive your friend, that you are most distinctly and definitely conscious of his presence and distinguishing features, and that this his perceptible being does not consist of ideal or mind-stuff.

This plain and indubitable consideration debars, as already stated, transcendental or intellectual Idealism, once for all, from having any voice whatever in this essential contention concerning the independent existence of what we believe to be other human beings, and the things of the world at large. For as it declares outright that our entire perceptual awareness is an illusive phantasmagoria, a mere confused outcome of inadequate cognition, it has to ignore its real significance.

After the previous epistemological discussion it can no longer be deemed doubtful, that what in various

ways becomes vividly and minutely signalized as other human beings and the other things of the world at large, conveys, in truth, so far as mere sensorial and phenomenal signs admit, a correct, reliable knowledge of their perceptible nature. Thus, when we scientifically examine a perceptible existent, say a human brain, it is in all verity the morphological and physiological characteristics of a real independently existing entity we are examining, and not merely our own perceptual awareness of it. The sensorial signs, by means of which these characteristics are revealed, are, it is true, mere superficial and evanescent phenomena, consisting mostly of shaded and colored visual forms and their mutual connections. But, so far as the nature of these sensorial signs allows, they faithfully represent the minutely organized presence and activity of a genuine naturalistic, and not of a merely ideal existent.

The principal difficulty in the way of the adoption of the naturalistic view here advocated, of the view, namely, that consciousness emanates from what is perceptually revealed as the organism and especially its brain, and not from a purely ideal substance; the seemingly insuperable difficulty here encountered has ever been the impossibility of conceiving how the molecular motion of a material body, such as the brain is held to be, can in any way be transformed into conscious states, how motion can be converted into sensation, or at all give rise to it. The glaring incommensurability obtaining between material motion of any kind and sensation, or any other mental or conscious mode, renders their interconvertibility or causal connection unthinkable. On the strength of much practical and scientific evidence most biologists and some psychologists are fully convinced that what we

perceive as the brain is in some manner the seat and matrix of consciousness. Only they fail to understand how this can possibly be the case, how a physiological function can result in a psychical effect. This being utterly incomprehensible, they either give up the puzzle as wholly insoluble, or they rest satisfied with psychophysical Parallelism.

In order to overcome in this connection the repugnance naturally attaching to the seemingly materialistic view, that our conscious content is a functional outcome of what is perceived as our organism, it may be well clearly to remind ourselves on what actual foundation the apparently trenchant dualism of body and mind is in reality based.

Let, then, a definite conscious content arise without direct sense-stimulation out of latent memory to fill the actual moment of awareness of a certain subject perceived by an outside observer. This conscious content will be all in all that is directly and subjectively revealed or present to the observed subject. On the same occasion in the outside observer, on the other hand, through roundabout means of definite sensorial stimulation, an entirely different conscious content correspondingly arises. He distinctly perceives a body or organism, and would, in case his vision happened to be sufficiently penetrating, moreover, become aware that in the brain of the perceptually revealed organism there is occurring a definite functional commotion.

From this undeniable state of things it follows that the perceptual organism within the conscious content of the observer cannot possibly belong to the observed subject, cannot be the subject's real organic being. Nor can the perceived functional brain-commotion,

forming likewise part of the observer's conscious content, be the real functional activity which is causing the emergence of the totally different conscious content in the observed subject. Hence the irreconcilable duality of body and mind. For what is here called the bodily organism is really a percept which may form part of the conscious content of any outside observer, or of any number of such observers. While what is here called mind is the exclusive conscious awareness of the observed subject. In this light it becomes evident why such a body cannot emanate mind, and why such mind cannot move or actuate what is perceived as body; simply because the perceived body forms part of the conscious content of a different person from the one who experiences the concomitant mental state.

The observed subject can, of course, likewise become aware of the perceptual body, just as the observer, by means of sense-stimulation. It is true, this body, though forming equally with other bodies part of his conscious content, is felt quite particularly to belong to himself. This, however, is due to inner or organic sensations spatially corroborating the externally stimulated sensations and percepts of sight and touch. I feel by means of inner sensations what is called my hand to be occupying a definite position in space. Through sight and touch this inner experience is corroborated in perceptual awareness, and vice versa. But the perceived body or organism is here, also like all other perceived bodies, only a transient sense-stimulated perceptual constituent of the conscious content, and is nowise the real organic being.

From the same actual state of things it can be furthermore rightly concluded, that it is an extra-

conscious activity within the extra-conscious being of the perceptually revealed subject, which causes his own moment of awareness to be filled with a definite conscious content, and which simultaneously causes to arise in the observer's conscious awareness a corresponding functional brain-commotion. The observed subject's conscious content is thus proved to be a functional outcome of his real extra-conscious being, and not of that which is only vicariously and symbolically revealed as the perceptual organism forming part of the observer's conscious content.

The perceptual organism and its functional brain-commotion within the observer's conscious content has obviously nothing whatever to do with bringing about what actually occurs in the observed subject. It has no effective influence upon it, though it vividly reveals the presence, characteristics, and activities of the real extra-conscious being of the observed subject.

It is clear, moreover, that the perceptual organism, forming part of the conscious content of the observer, is not only not a material body, as is generally taken for granted, but that it is, on the contrary, out and out of the same forceless, evanescent psychic consistency as the transient conscious content of the observed subject. There obtains here absolutely no duality of nature between mind and body, for the organism actually and bodily perceived is just as much a psychic phenomenon as the conscious content of the observed subject.

It is evident, however, that the perceptual organism and its definite brain-commotion is aroused in the observer by stimulating influences emanating from the real power-endowed, extra-conscious subject he is observing, and that it reveals therewith with vivid

precision, though vicariously and symbolically in terms of perceptual consciousness, its presence, characteristics, and activities.

As to the observed subject's own conscious content, consisting, as it does, of a complex of feelings, sensations, perceptions, emotions, volitions, and thoughts, it is like all modes of consciousness utterly forceless and evanescent, a mere content of lapsing time with no power whatever to stimulate the senses of observers, or to influence other existents in any direct manner. A being consisting of nothing but what is actually experienced as psychical would, as has been epistemologically shown, be wholly imperceptible to observers, wholly non-existent and non-efficient.

The epistemological explanation, here again reiterated, of the apparent duality of mind and body, based on undeniable facts as it actually is, solves an ancient and obdurate riddle that has played a most conspicuous part in philosophical contemplation. It is pregnant with the weightiest consequences. For it renders evident that it is the real, extra-conscious, power-endowed existent perceptually revealed as our organism, that is the veritable bearer, veritable actuating matrix and manifesting agent of our all-revealing conscious content. This our real being emits directly, from within, our own conscious content; and indirectly, through roundabout external sense-stimulation, it compels also its perceptual representation in observers.

The observer's perceptual awareness of the organic body constitutes its physical, sense-stimulated aspect. And it is this perceptual organism which is the direct object of biological research. A biological investigator has consciously before him as direct object of re-

search only his own sense-stimulated percepts. If these did not reveal the real existence of an extra-conscious being, subsisting independently of being thus perceived, he would then be investigating nothing but his own unaccountably arising conscious states, and pure solipsistic Phenomenalism would be the consistent outcome of such a state of things.¹

It would be a mistake to think that the simple epistemological solution of the perennial dilemma of body and mind here advanced is gained by merely offering another kind of Dualism for that introduced by Descartes; namely, on the one side the forceless, transient conscious content, including all we are actually aware of as body and mind; and on the other side a world of enduring extra-conscious existents in forceful interaction with one another. The all-revealing conscious content is, however, quite obviously, only a casual outcome of certain modes of activity of the enduring, extra-conscious existent or subject, who becomes aware of it as his own conscious content. It is a specific function of his own definitely organized self, immediately and exclusively experienced by him, and receiving its significance by being composed of conscious signs, which signalize what is happening in the sphere of real, extra-conscious existence. And the entities that compose the extra-conscious macrocosm prove to have, besides many other modes of efficiency, the unremitting power to stimulate in definite ways the sensibilities of living organic beings, so as to

¹ This plain epistemological solution of the philosophical riddle of body and mind has been published by the present writer for the last twenty-eight years in a number of articles, the last appearing in the *American Journal of Psychology*, April, 1905, as extract from this treatise.

make their presence and characteristics known to them; an unremitting power evinced likewise, and more completely still, in their action upon photographic plates or films.

There exists, therefore, in reality only one unitary cosmos, consisting of interdependent, power-endowed, extra-conscious entities. Of this cosmos of interdependent existents the extra-conscious organic individual forms a highly elaborated integrant part; and his all-revealing conscious content is here on earth the supreme outcome of vital interaction with the outside world.

In order adequately to realize that such wondrous potencies may indeed inhere in existents, of which we have only perceptual knowledge, it is of utmost importance to recognize how remotely symbolical of the real nature of the extra-conscious existents our perception of them must necessarily be. Although tactual sensations, themselves mere transient modes of awareness, yield the most direct and positive signs of the presence of extra-conscious existents, we practically and scientifically infer their presence and characteristics principally by means of visual percepts. How, then, are these visual percepts aroused, and in what do they consist?

An intervening medium is here with necessity inferred by science as mediating between the percipient and the perceptible existents; between, let us say, a scientist and the extra-conscious organ he is investigating, and which is visually revealed to him as a brain. Consequently it can only be specific modifications of the intervening medium, impressed upon it by the distant extra-conscious entity, that are directly affecting the observer's visual sensibilities, arousing the signaliz-

ing percept called a brain to make its appearance within his conscious content. The specific ethereal or radiant influence, the only influence that reaches the observer's vision from outside, is obviously not itself the entity which the aroused percept signalizes, but only a specific mode of activity imparted by the same to the adjacent medium. Consequently and incontestably, the entire perceptual appearance made to arise in the percipient, by a definite mode of such vicarious stimulation emanating from the perceptible object, is out and out a product of the percipient's own organic being. How adventitious, then, and yet how subtly specific and widely irradiating must be the stimulating influence that reaches from afar the sense-affected being, and that may reach at the same time thousands of such percipient beings. And as regards the signalizing visual percept itself, aroused in this vicarious manner, it is found to consist of nothing but shaded and colored modifications of our general space perception. The real perceptible entity is, therefore, consciously represented in the percipient subject by nothing but ethereally aroused visual phantoms. Other than visible characteristics of the same entity may, of course, become additionally signalized by stimulation of our other sensorial sensibilities; but always only by remotely symbolical signs, as in the case of vision.

It is, consequently, an unknown activity, unknown as to the way it extra-consciously operates, which is unremittingly imparted to the medium, and which casually arouses in observers the percepts signalizing the presence and characteristics of the perceptible entity from which it emanates. The unknown agent which directly arouses vision cannot be rightly called

“light.” For light is merely one of its effects in relation to our visual sensibility. Nor can it be rightly called “ethereal vibrations,” for these again are merely a visual representation of what is believed to be the special mode of the extra-conscious activity. Like all other activity in nature, it makes its presence known to us solely by means of the conscious modes it awakens. And it receives its marvelously specialized character from influences emanating from the distant entity whose visible presence and minute spatial features it vicariously conveys to the percipient. It is clear that only an evolutionally developed pre-established harmony can here render the definite percept arising within the percipient strictly and minutely representative of the corresponding perceptible entity subsisting outside the percipient’s being.

The final outcome of this complex process of effectuation is, in the special case under consideration, the definitely shaded and colored visual form we call a brain, whose most intricate and minutely organized structure we are getting intimately to know by means of artificially heightened and assisted vision. Under such eminently vicarious conditions of visual perceptibility it is evident how superficial and remotely emblematic of the real, extra-conscious entity, despite all its vivid and definite configuration, must be the casual and transient visual percept called a brain.

And this being so, what legitimate grounds have we to deny to this extra-conscious, power-endowed entity, proved to be most gradually and toilsomely organized, and which is only vicariously, superficially, and emblematically revealed; what grounds to deny to it the power of emanating the mental modes of which it is manifestly the real matrix? In fact, multifold evidence

renders inevitable, to all who contemplate it with unbiased mind, the conclusion that the real entity, which to our visual perception is emblematically revealed as brain-structure; that this extra-conscious entity is in all reality the permanent, efficient matrix which potentially harbors memorized experience, and from whose functional activity the conscious content issues into manifest existence. This is, indeed, proved by its minute and significant organization; by the definite localization within its complex structure of special modes of awareness; by its development in the scale of animal life parallel to that of the conscious content; by strict correspondence of morbid mentality to abnormal functional activity and pathological degeneration; by the loss of consciousness upon cessation of its functional activity, and upon final dissolution. All this irrefutable evidence, against which the notion of an ideal bearer or matrix of consciousness appears to biological contemplation to be an altogether fanciful creation; all this multifold evidence points conclusively to our individual consciousness being the outcome of that which is perceptually revealed as functioning brain-structure.

Indeed, what else could all this definite experience concerning the organism and its brain signify, but the conscious revelation of a permanent entity to which it applies? What imaginable significance could the vivid and minutely differentiated perceptual appearances, whose commotions are found exactly to correspond to the sundry mental states of an observed subject; what imaginable significance but that of revealing the activity of the extra-conscious entity, which is the real matrix of the observed subject's conscious content?

Otherwise this perceptual experience regarding the brain and its functions could have no meaning beyond itself. And all scientific investigation concerning it, carried on by a host of close and scrupulous observers in the firm conviction that they are investigating a real permanent existent, would be but a delusive waste of infinitely laborious research. For they would then be examining nothing but their own individual casual and evanescent percepts, which occupation would be utterly wasted, and could nowise yield the scientific results actually attained. Nor would it be in the least intelligible, how results separately reached by a number of investigators could possibly correspond and corroborate one another.

At the risk of being inordinately tedious, no occasion must be passed by to expose again and again the utter futility of transcendental and other kinds of pure Idealism. They obstruct the way towards a true interpretation of nature, and their tenets are still leading many serious thinkers astray; either imprisoning their thought in the magic circle of solipsistic Phenomenalism, or causing them to look upon actually experienced nature and our real life therein as a mere inadequate, confused conception of no essential consequence. The aim of this treatise, on the contrary, is scientifically and epistemologically to demonstrate that consciousness, and with it all psychic existence we have knowledge of, is wholly and strictly dependent on specific modes of vital organization.

To transcendental Idealism, whose *raison d'être* is to deny that perceptual experience signalizes a perceptible world subsisting independently of being perceived, to such intellectual Idealism the perceptual brain with its functions is even more meaningless than

to sensorial Idealism. Under the transcendental view these perceptual appearances can have no significance whatever for real cognition. They cannot even form the sometimes surmised instrument upon which a supposed ideal entity is playing conscious tunes. For no instrument can possibly be fashioned out of the set of casual and transient visual percepts which constitute the brain we are actually aware of, its material consistency being here altogether out of question. To transcendental Idealism the perceptual brain is not even what it consciously appears to be, but is declared to be a mere illusion of sense. This world-estranging, life-negating doctrine holds perceptual phenomena to have their real being in concepts or notions. But it can nowise show how these concepts come to their perceptual content. Under this topsy-turvy view the general concept of a brain implicitly comprises, before and independent of all actual perceptual experience, everything that becomes eventually revealed by means of perceptual experience concerning the brain and its functions. It gradually unfolds this ideal and implicit content, so that it perceptually appears as an endless succession and multiplication of countless numbers of manifoldly organized brains, forming part of a multitude of perceptual individuals; all this having no real being beyond the universal concept, which is thus unfolding itself in time and space. This amazingly eccentric view is that of consistent transcendental Idealism; for which the brain and its individual bearer are in reality nothing but modes of inadequate conceptual recognition, referring to an eternal system of perfect Ideas.

To epistemological Naturalism the very reverse is what actually takes place. A number of real,

extra-conscious investigators have gathered and communicated concurrent experience of a vast number of facts concerning brains, belonging to various classes of real animals and to many real human beings. All this extensive and minute experience has been progressively condensed into the conceptual, representative knowledge of the sundry general characteristics appertaining to the real existents that were brought under observation. This conceptual knowledge has evidently no other existence, save as implicitly preserved in the extra-conscious matrix of the conscious content of a limited number of individual biologists, into which latently abiding matrix it has by degrees been organically inwrought as memorized experience, ready to arise on occasion into conscious awareness. A conceptual Idealist who had never seen a brain or read about it, would most certainly not have the remotest inkling of its appearance. Without manifold, definite perceptual experience no concept of brain-characteristics could possibly exist. Such conceptual knowledge is clearly entirely dependent for its existence upon perceptual experience. And this perceptual experience is again entirely dependent on the sense-arousing influences emanating from the extra-conscious existents under observation. Without sensorial and perceptual experience concepts would signify nothing whatever.

A concept, being itself merely a transient constituent of the conscious content, can have no permanent content of its own; but has to receive, each time it issues into consciousness, the entire content it representatively carries with it from the same latent store of memorized experience, whence it itself emanates. It is, in fact, a mere conscious representative sign of its

implied content. Consequently, instead of perceptual awareness being dependent for its existence on conceptual awareness and being primordially involved in it, as transcendental Idealism maintains, the exact reverse is actually and plainly the case. Sound reasoning, based on actual experience, rightly concludes that the enduring matrix of the entire conscious content, of which conceptual as well as perceptual awareness form integrant parts, proves to be the extra-conscious entity perceptually revealed as the organism and its wondrously elaborated brain-structure.

Reverting to the alleged primacy and all-involving nature of conceptual cognition, what kind of reality is it declared to recognize before being fertilized by actually accrued sensorial and perceptual experience? The answer is made up of mere negatives. It assumes as source of all consciousness and of all existence an *imperceptible*, *unknown*, purely hypothetical eternal totality of Being, which it posits without the least actual experience of its existence and nature to go upon, or to guide its fancifully transcendentalized supposition. What is here really substantialized as an all-comprising Absolute, or as all-efficient cognition, conation or affection, has as its true foundation really nothing more than the potentially all-containing matrix of the Idealist's own individual consciousness.

In opposition to such wholly hypothetical Transcendentalism, it has been here clearly demonstrated that our cognitive, conative, and affective modes of consciousness have one and all no other real transcendent significance save in relation to the perceptible world, our own perceptible being, of course, included.

Deductive logic and its analytical propositions yield, as Kant learnt from Hume, and as he has elaborately

shown, no knowledge beyond that, whose material has been sensorially given and synthetically apprehended. The totality of implicit knowledge from which such logic draws explicitly its expositions is that which has become organically systematized in the matrix of our conscious content where alone it latently abides as memorized experience. Quite true what Leibnitz asserts inconsistently with his *Monadology* and in opposition to Locke's *tabula rasa*: "*Nihil est in intellectu quod non fuerit in sensu, nisi intellectus ipse.*" But what is here called "intellect" is neither what Leibnitz understood by it, nor Kant's pure reason with its synthetizing categories. It is, in fact, the entire organically developed individual himself, who proves to be rational, because his life and consciousness have been evolutionally adapted to the conditions of his environment. And he proves, on the contrary, to be irrational as soon as this normal adaptation becomes abnormal. The matrix of consciousness harbors in potential latency all modes of cognition, and consequently also rational modes.

You discard, as non-existent, all perceptible existence inferred by common sense and epistemological Naturalism, as it is being signaled by compelled percepts, and nothing remains but the phenomenal conscious content as such, which is necessarily itself inferred as emanating from an all-containing matrix. It is obviously this necessarily inferred matrix of consciousness that has to play the part of the unconscious content of the monads of Leibnitz; also that of Kant's intelligible Ego; of Fichte's absolute Ego as all-positing act; of Schelling's Subject-Object; of Hegel's absolute Idea. And almost from the dawn of philosophical contemplation this latent, logically synthetized con-

tent of experience or knowledge has been identified with the abstract, complex notion called "Reason." And this because its rationally significant, logically involuted constitution in relation to the outside world, becomes revealed as such in its conscious outcomes; and because this conscious outcome is, moreover, to some extent subject to the sway of rational volition, of volition informed by results of actual experience.

At times, however, the effective or conative modes of consciousness, and especially the latter under the name of "Will," have been made in philosophy to absorb the cognitive modes, being in their turn hypostasized and substantialized as transcendent, all-efficient agencies. Thus "Love" or "Will" are sometimes conceived as all-containing, all-creating principles of Being or Reality.

It has, one would think, become now sufficiently clear, that neither cognitive nor conative nor affective modes of implicit or explicit, of potential or actual consciousness, be their content ever so logically synthetized, have any but experiential significance, and this only in final relation to existents of the perceptible world, our own perceptible being, and that of our fellow-beings naturally included. Our real being and its enduring matrix of consciousness abide in the sphere of extra-conscious, transphenomenal existence. And the activities that latently fashion accruing experiential facts into systematized experience or knowledge, which then issues it successively and fractionally into actual awareness; these inmost activities of the real, extra-conscious individual accompany the fleeting conscious appearances attentively and apprehendingly, and they instinctively or volitionally react in an appropriate or purposive man-

ner upon the outside world as perceptually revealed. These extra-conscious activities, resulting in mental occurrences, are set going in the same power-endowed sphere, wherein our enduring self and its matrix of consciousness have their real being. These specific activities of the organic being are, consequently, as such, unknown processes, processes taking place outside conscious awareness. They are, however, definitely signaled by the specific conscious states to which they respectively give rise. These conscious states, affective, conative, and cognitive, are themselves forceless and evanescent. It is our transphenomenal being that becomes consciously aware of its vital activities. It feels its feelings, perceives its percepts, thinks its thoughts, and wills its actions, but only in relation to existents of the perceptible world, unless when revealing in the realm of pure fancy, or when demented.

In this connection the relation of volition to bodily movements has proved preëminently a standing puzzle to philosophical interpretation. Hence Cartesian Occasionalism, Leibnitzian preëstablished harmony, Berkeleyian and other forms of transcendentially effected coincidence or parallelism between mental volitions and bodily movements.

The actual state of things, here repeatedly pointed out and epistemologically demonstrated, is, however, quite obvious. For it is the outside observer, who perceives as his own percept, within his own conscious content, the body or organism of an observed subject. And it is the observed subject as an extra-conscious being who exercises his volitional activity in a certain manner, whereupon the features, the arm, or any other member of the perceptual body within the observer's conscious content moves in a

definite manner. It is evident that what the observed subject has really volitionally actuated is not anything perceptually figured within the observer's conscious content. The willing individual exerts his volitional power irrespective of any perceptual knowledge of the organs he is actuating. He has no direct knowledge of what is perceptually known as his brain and muscles. He actuates what is perceptually signaled to the observer, as, for instance, his arm, utterly unconscious of the particular brain-centers, the particular muscles, and the visual and tactual limb so distinctly perceived to move by the observer. He is himself entirely guided by inner organic sensation, which differs altogether from sense-stimulated perceptual awareness.

In fact, all perceptually apprehended movements or motions in nature are mere visual or tactual signs of extra-conscious actuation. The recognition of this real state of things is of the utmost importance to the true understanding of physical facts.

In this epistemological light it becomes clear why no efficient nexus can be conceived between the so-called volitional fiat and the bodily members seen thereupon to move. The real nexus obtains here between the transphenomenal volitional activity of the extra-conscious subject and his own real extra-conscious members, and it is the result of this extra-conscious process that is perceptually signaled to bystanders as bodily movements.

The living human organism is endowed with the power of originating and arresting manifold volitional activities; in fact, this activity-controlling power intentionally exercised is what is more particularly designated as volition. Perceptually signaled, such

spontaneity of action would be seen to arise as definite brain-commotion, thence to spread to a certain set of muscles, resulting in what may be perceived by any outsider as a certain movement of features or limbs. All this by-play is evidently something quite adventitious, which nowise enters into the effective volitional nexus, for it all takes place in the conscious content of outsiders. The actuating subject sets the volitional process going irrespective of any perceptual awareness of his own organs, either by himself or by others. It is primarily by means of his inner organic sensations that the willing individual gains information regarding the existence and position of the members he intends volitionally to actuate. But neither do these inner sensations, which indicate by specific local signs the member to be moved, enter into the effective volitional nexus. As conscious states these modes of forceless awareness can merely yield definite information to the acting subject, but are powerless to impart themselves activity to anything whatever.

The power to initiate volitional activity along pre-organized tracts, leading to the execution of purposive movements, seems to be exerted trigger-fashion upon or within what is perceptually signalized as brain-structure, and it spreads then along definite channels of what is perceptually realized as neural and muscular substance. New, unpracticed kinds of purposive movements have to be intentionally practiced before they can be performed with ease, which proves within the sphere of skilled performances a certain degree of free spontaneous control over motor outcomes not preorganized, but whose pathways become eventually structurally organized under voli-

tional activity. This obvious volitional power over what is perceived as structural organization plays a most important part in the development of human life and in the formation of human character.

Suitable to the being's vital needs or objective desires definite organic nexuses have, however, been phyletically established, whose actuation conduces more or less automatically to the satisfaction of these needs or desires. The special needs are consciously signalized by organic feelings, partly affective and partly conative. The objective desires are awakened by perceived or remembered objects of satisfaction. And the satisfaction itself is consciously made known by feelings of a pleasurable kind.

The acting being is immediately conscious only of the feeling which indicates the organic need, and the sensation, percept, or idea which directly or indirectly represents the means of satisfying it. He knows immediately nothing of the organic nexus through whose actuation the need or desire finds satisfaction; nothing of brain, nerves, muscles, and organs of perception. His vital organism wrought by agencies not belonging to the sphere of consciousness, is sustained and actuated by these same extra-conscious powers. The presence of the organic sensation indicating a vital need or desire; the conscious state representing an object of satisfaction, or the mere idea of it, tend by force of a preëstablished organic nexus more or less imperatively to touch off or incite the activity through which the need or desire becomes satisfied.

The organic individual perceives, for example, an apple. Let this percept coincide consciously with the feeling of hunger. An object through which the vital

need finds satisfaction being thus signalized, the accustomed activity is intentionally set going, which results in the prehension and eating of the perceptually signalized apple. Now, although the entire performance takes place through the mediation of conscious states; namely, the conscious feeling called hunger, the conscious percept called an apple, and the organic sensations accompanying the activity; yet it is obviously the extra-conscious organic being who feels the hunger, perceives the apple, experiences the organic sensations, and performs the purposive actions. And it is an extra-conscious object which satisfies the hunger. It is not the mere feeling of hunger that is really satisfied, but the vital need indicated by the feeling. And it is not the perceptual apple that satisfies the need, but the real existent signalized by the visual percept called an apple. And it is not the feeling of volitional activity that actuates the purposive movements, but the extra-conscious, volitionally endowed subject.

Surely, despite Berkeley and all consistent Idealists, we do not eat our own percepts, nor those of other people, not the perceptual apple forming part of our own conscious content, and at the same time forming also part of the conscious content of any number of individuals who may behold it. Nor does the vital fruition of eating really consist in getting rid of the painful feeling of hunger, and of experiencing in consequence pleasurable feelings of satisfaction; but it consists in verity of the organic process of nourishment, which means structural reintegration following upon functional disintegration. This mere instrumentality of feelings in the service of extra-conscious processes is a fundamental truth of high ethical importance.

To the organic individual, leaving out of account his constant organic sensations, there is here immediately present to consciousness nothing but the feeling of hunger and the perceptual apple, whereupon he brings into play the self-acting powers of the extra-conscious organic nexus, which ultimately results in the prehension and eating of the apple. Notice how meager are the conscious accompaniments of this highly complex activity taking place within a most intricate organic nexus, and followed up, moreover, by a long series of unconscious processes which minister to the nutritive restoration of the organic being. To pure Idealists all these organic processes count for nothing. But can there remain a doubt that the extra-conscious organic processes and their results play here the essential part, to which the concomitant conscious or ideal states are mere auxiliary means?

This evident conclusion is, moreover, corroborated by what an outside observer may experience on the same occasion. He beholds as his own percept the entire body of the acting subject, together with all its movements. And, at a distance of this perceptually revealed subject he perceives an apple, which is then seemingly by means of the movements he perceives seized and eaten. And, if possessed of the knowledge acquired by scientific investigation, and hypothetically endowed with sufficiently keen and penetrating vision, the observer would furthermore perceive how the apple was imparting a definite, complex motion to the intervening medium, how this motion impinged on the observed eye of the subject, being then propagated along the optic track, reaching the cerebral visual centers, where a specific commotion became visible amid its marvelously minute and intricate structure;

the motion taking then a downward course along certain motor nerves, ending in the contraction of a definite set of muscles, and resulting ultimately in the prehension and eating of the apple.

All these observed facts consist entirely of a series of conscious phenomena arising in the conscious content of the observer. The perceived apple, the body of the observed subject with all its organic structures, and all its functional motions and purposive movements, all this accrues to the observer as his own perceptual awareness. How rich and instructive must be deemed this conscious experience of the observer compared with that of the acting subject on the same occasion. And this, notwithstanding that it merely consciously signalizes, by means of ineffective, transient, symbolical phenomena, what is actually and effectively taking place in the extra-conscious being of the observed subject.

All these perceptual occurrences, generally believed to be operative in effecting organic results, have in verity not the least influence upon them. But they yield our most instructive knowledge. Physics and biology are entirely made up of such perceptual experience. And what would we really and positively know about the world and our own organic being without such sense-stimulated revelation?

Clearly, to recognize that all effective work in nature is wrought in the realm of extra-conscious existence, and that all conscious phenomena, which appear as perceptual and other modes of awareness, do nowise themselves enter into the effective or creative nexus, but are merely reliable signs signalizing what is extra-consciously occurring, and what has been formerly experienced in relation to it; clearly, to recognize this

fundamental truth is, it need hardly be said, of utmost importance to a correct scientific and philosophic explanation of what really constitutes nature and our own relation to it.

There is, then, concerning that which is consciously revealed as nature, what may be called an outer view, the onlooker's view; and also what may be called an inner view, the observed subject's own conscious content. The observed subject shares, as forming part of his own conscious content, the outer view with all other onlookers. This outer view shared in common consists directly of sense-stimulated perceptual experience, and indirectly of its remembered representation. The inner view, consisting of the percipient's own entire conscious content, is his exclusive property shared by no outsider. And the conscious contents of the many outsiders, whose perceptual modes reveal the presence and characteristics of one and the same observed subject, and of one and the same extra-conscious macrocosm, are likewise their own exclusive property unshared by other percipients.

There is, thus, nothing consciously present in existence, save only the outer and inner view of natural occurrences, inferred to constitute the conscious content of beings which are percipient and perceptible. As regards experience or knowledge it is clear that it can be derived solely from these two distinct sources. Outer or perceptual experience reveals directly to all normally constituted percipients one and the same perceptible, extra-conscious nature. And this is what is called the physical aspect. Inner or introspective experience, leaving out of consideration its significance in relation to outside perceptible nature, reveals directly only what is exclusively taking place in the

introspector's own being. It is this intimate experience, consisting of a complex of affective, conative, and cognitive modes of awareness, that cannot be perceptually shared by outsiders. Outsiders, on the other hand, can gain perceptual experience of the extra-conscious processes occurring within the perceptible subject, the very processes which give rise to his inner, unshareable awareness. Of these organic processes the observed subject is himself directly unconscious. But it is only by means of the observer's perceptual experience of them that is acquired the scientific knowledge, regarding the organization and the vital processes which underlie the phenomenal play of consciousness. This most important knowledge is, however, revealed only in the symbolical terms of the percipient's own perceptual awareness, mostly in the medium of mere visual phenomena.

Without the outer view, containing the revelation of a perceptible, extra-conscious realm of existence, peopled by extra-conscious existents or entities, there would be nothing extant in awareness but a single solipsistic conscious content, miraculously arising out of vacancy and relapsing into it, signaling nothing beyond itself, being, in fact, utterly meaningless. Hence the impossibility of a purely phenomenalist psychology which disregards the extra-conscious significance of the conscious states. A perceptual brain would then be nothing but a meaningless complex of transient visual and tactual forms; and just as meaningless would be all the other constituents of the conscious content. Love and fear would, then, not be the love and fear of something or of some one; but would be a mere phenomenal affection, inhering in nothing, felt by nobody, and referring to nothing; of

course an impossible state of things. And, in fact, the entire feeling, perceiving, thinking, and willing human being is always presupposed in such idealistic flights of fancy.

The principal difficulty encountered in disentangling the factors that enter into the constitution of the conscious content, and impart to it its significance, lies in the fact that the conscious individual contains and realizes within himself the two entirely different modes of awareness, the inner mode unshareable by outsiders, and the outer mode shared equally by outsiders. This outer mode of awareness becomes in the conscious individual inextricably blended with the inner mode, as integrant part of his fund of memorized experience. It, however, never ceases to refer to the perceptible world equally realized by outsiders. The outer or physical experience, directly verifiable by all percipients and consisting of compelled, specifically stimulated percepts, can be practically isolated and examined as immediately given in perception. The inner or psychological experience, on the other hand, can nowise divest itself of the acquired physical experience in introspective examination and contemplation. These distinctions here pointed out are not merely hypothetical. They are positively corroborated by cerebral histology, physiology, and pathology. For there are discovered in the cerebral hemispheres separate seats, whence respectively emanate these different kinds of conscious awareness, and also the structural connections between them; between, for instance, the seat of the inner, organic awareness of our own body, and the centers of outer perceptual awareness.

It is, then, the perceptually revealed organism that as a living, relatively permanent, extra-conscious,

power-endowed being, feels, craves, desires, perceives, thinks, and wills, and this *always in relation to a world of outside existents perceptually revealed*. The organically ingrained nature of this being is instinct with self-preserving solicitude amid a complex of surroundings, advantageous and disadvantageous to itself; instinct at times with the insistent impulsion towards propagation, which leads to the preservation of the race, and which finds preconcerted satisfaction in complementary union with a kindred mate, and eventually, moreover, in the tender, altruistic rearing of offspring; a being whose life is sustained by the breathing of outside air and the eating of outside food; a being that fears danger from outside intrusion, and enjoys fruition of its needs from what is derived from outside sources; whose anger is aroused by the enmity of other beings, and his affections by their friendliness; whose manifold emotions are normally awakened by the sight or thought of whatever the outer world has in store as means of appealing to his likes and dislikes; and whose religious, social, artistic, and ethical aspirations all find their objective aims and fulfillment in formations fashioned in accordance with perceptual experience. Physically and psychically the living being is out and out organized in relation to specific agencies of a world outside himself; and his life is unremittingly sustained and carried on solely through interaction with these external agencies.

Now, it is no other than this same impassioned being, endowed with a phyletically derived store of vital potencies, all applying to the sense-revealed world, and vivified through ceaseless interaction with it; it is this same eminently efficient being, aimfully organized in relation to its medium, that idealistic

speculation declares, either to consist of nothing but modes of conscious awareness, or to be a mere conflux of inadequate ideas pointing as their real source to a supreme, all-sufficient consciousness.

To such extremes of vapid, anti-natural conception has philosophical thought been driven by relying exclusively in its reasoning on immediately given but utterly forceless and evanescent conscious data; regardless of their sane, common-sense implications, and their substantial biological foundation.

VIII. BIOLOGICAL FACTS UNDERLYING PHILOSOPHICAL PROBLEMS

To give an intelligible account how the present writer has arrived at the biologico-philosophical views expressed in this treatise, a brief summary of the steps which have led to them may perhaps be pardoned. More than forty years ago, while acting as pathologist at St. Thomas's Hospital in London, examining microscopically numerous cancerous tumors and other morbid growths, I became convinced of the fallacy of the cell-theory. Moreover, pus-corpuscles, believed at that time to be cells in the act of proliferation on account of their seemingly dividing nuclei, I found to be a product of decay and not of growth. In experimenting with the remarkable formative substance known as myeline I succeeded in artificially imitating most forms of cells and nuclei, and with the help of other observations I showed that cell-like bodies may form in great numbers without being derived from an original mother-cell. All this tended to prove that the cellular form, accepted as being of specific importance, was not really of essential significance. The dictum, "*Omnis cellula e cellulâ*," and the typical cell-form as a separate unit in the construction of animal bodies, became to me biological dogmas of problematical validity. The principal results of these investigations were gathered together in a paper read before the Royal Society in 1866, and separately published in a pamphlet under the title, "On the Formation of So-called Cells in Animal Bodies," 1867.

Becoming involved in an extensive medical practice, I found time in the next years only to investigate the activity of living muscular fibers. The view of R. J. Mayer, that a muscular fiber is merely a piece of stable machinery actuated by heat power derived from the combustion of food particles was then generally accepted. The examination of living muscular fibers of insects, and especially those of grasshoppers, proved to me that the working power of muscles is inherent in their own protoplasm, and that their activity is due to vital changes in the muscular substance as such, and not to any mechanical heat-engine sort of actuation. The contemplation of this direct observation caused me to doubt the validity of the mechanical theory of vital processes, and analogically also the entire mechanical theory of natural occurrences. For what is perceived as matter, and mostly held by scientists to be composed of inert and qualitatively undistinguished atoms, was clearly, as here evidenced, consisting of force-endowed substance of a qualitative or specific nature. A brief account of this investigation was published in "Centralblatt f. d. med. Wissensch, 1870." Henceforth, vitality as a property inherent in the living substance became to me the fundamental problem of biology, whose solution would probably also afford a clew to unsolved philosophical problems. But the philosophical truth which I had previously recognized; the truth, namely, that what we are actually aware of forms altogether part of our own individual consciousness; this ineluctable truth rendered the ascertained biological facts, as applying to real existents outside individual consciousness, of uncertain reliability, and kept me puzzled.

My attention was early given to philosophical

problems. In my student days at Heidelberg I had enjoyed personal intercourse with prominent philosophers of opposite schools, transcendentalist and materialistic. Like other medical students of my acquaintance I was then rather inclined to accept a materialistic interpretation; although aware of the difficulty to understand how psychical phenomena can possibly result from material and mechanical causation. Later in Bonn, while attending the lectures of Helmholtz on the physiology of the senses, the epistemological problem of the relation of body and mind became impressed upon me as indispensably connected with a true understanding of vital processes. These sundry biological and philosophical doubts and puzzles accompanied me on my further course.

Years after, when I retired from medical practice to devote myself entirely to the elucidation of these great problems, I first sought to gain firm ground with regard to the epistemological problem. In 1871 I published in book form in German a "Refutation of the Kantian Theory of Knowledge from the Empirical Standpoint," whose subtitle, "A Preliminary Contribution towards the Establishment of a Physiological Conception of Nature," clearly indicated the inception of the views advocated in this treatise. I had arrived at the conviction that the perceiving and thinking individual being obviously organized through and through in interrelation with a given environment, a correct understanding of his vital organization would be sure to throw light on the scientific bearings of natural phenomena in general and of philosophical problems in particular. Many years were now given to a close study of the vital properties of protoplasm, that wonderful living substance which composes all

organic beings, and is the veritable life-bearer. I selected, as the most appropriate objects of research, primitive forms of life, in which the vital movement and the entire cycle of interdependent vital activities are transparently visible, and can thus in their totality be directly observed. Only when after years of investigation I had arrived at an amply verified conception of vitality and organization did I venture to publish results in English and German periodicals. The earliest paper appeared, 1878, in "The Popular Science Monthly" under the title "Monera and the Problem of Life"; the latest after twenty-seven years of further research and study under the title, "The Vitality and Organization of Protoplasm," 1905. Reference to a number of intervening papers is given in other sections of this treatise.

On the strength of my direct observations I claim to have positively ascertained that the living substance or protoplasm owes its vitality, or its being alive, to a process of interaction functionally carried on between itself and its environment at the surface of contact; that this process consists demonstrably in functional disintegration induced from without followed by functional reintegration from within, by force of which the living substance forms an integrant whole composing the entire organism. It is nowise, as generally asserted, made up of an aggregation of separate autonomous units of any kind. And this same vital process of disintegration and reintegration necessarily and observably draws with it the other essential functions of vitality; namely, nutrition, subserving the reintegration of the living substance by supplying it with complemental material, and depuration, whose function is to eliminate the effete products

of disintegration and the unassimilable residue of nutritive material. These three essential functional operations, at work throughout the entire scale of animal beings, form the definite cycle of interdependent activities that constitute the principal functional and structural subdivisions of the organic whole.

Under this conception of the unity of the organic individual, founded on direct unmistakable observations, aggregational theories of autonomous or separate units as constituent elements of the organic being, advanced by leading biologists, proved on close scrutiny altogether untenable. Vitality and organization are clearly the perceptible expression of a definite cycle of interdependent activities taking place within one and the same indiscerptible substantial entity, rightly deserving the name of "living substance," which signifies that what is called "life" is its own intrinsic property, and not any extraneous principle mysteriously superadded. The assumption of autonomous cells as aggregated constituent elements of the out and out organized unitary individual, and of the composition of such autonomous cells by a further aggregation of secondary units, such as Darwin's gemmules, Hæckel's plastidules, Weismann's biophores, De Vries's pangenes, and a number of other purely hypothetical elements; this assumption gives rise to painfully labored, illogical theories of vitality and organization, wherein the imagined imperceptible units are, to begin with, arbitrarily endowed with all the properties they are invented to explain. I have repeatedly shown the utter insufficiency of such aggregational theories.

The recognition of the true nature of what is perceived as the vitality of the functionally and structur-

ally unitary organic individual, which individual forms by force of its maintained reintegration to full efficiency the only veritable substantial entity known in nature, remaining, as it does, integrantly and efficiently intact, despite the constant changes it undergoes; this most essential recognition of the actual nature of vitality furnishes the clew to the interpretation of the complex organization and functional cooperation of the sundry parts and organs of higher forms of life. And it yields also a clew to the solution of hitherto insoluble scientific and philosophical problems, of which that of substantiality as something identically enduring, while nevertheless the source of changeful phenomena, has played by far the most important part in attempts at interpreting natural phenomena.

But although the perceptible phenomena manifest to all observers directly and clearly the dependence of the vitality and organization of living beings upon interaction with their outside environment, and although their visible constitution, and their own perceptual awareness, have no significance except in relation to modes of such interaction, still the irreversible truth remains that everything consciously realized, which includes everything we are at all aware of, consists exclusively of mere modes of such conscious awareness. We are obviously actually aware only of what at present forms part of our individual conscious content; all the rest is inference from the data thus consciously given. Such solipsistic conscious data, themselves eminently fleeting and forceless, make, however, no sense of their own, and are incapable of composing anything enduring and coherent, unless reference be made to a realm of implicated abiding,

extra-conscious, power-endowed existents. The real existence of such is anyhow taken for granted by common sense, and in practical life, notwithstanding that this existential belief is in verity grounded on mere phenomenal perceptual appearances. Hence the necessity of a valid theory of knowledge which justifies the inference that our individual perceptual awareness truly signalizes the real presence and characteristics of an extra-conscious world perceptible to all percipient beings.

Solipsism, which abstains from referring to anything beyond its own conscious content, consistently leads to mere phantasmagorical Nihilism, with negation of the existence of the conscious individual as a real identically abiding entity, and all the more with negation of the real existence of all other living beings and perceptible things outside the purely phenomenal and ever-lapsing solipsistic conscious content. A genuine solipsistic interpretation of natural occurrences is, however, an impossibility, and all attempts at it have signally failed. Reliance on something enduring, and if it were merely reliance on an enduring memory of what from moment to moment is flowing out of awareness, is evidently indispensable to any apprehension and interpretation of what is actually experienced. For this reason, and for the further reason that a number of prominent investigators are attempting not only to interpret perceptible phenomena exclusively in terms of their appearance in perceptual awareness, but take also the fleeting and forceless sensorial elements of such awareness to be the veritable material out of which the real world is constructed; for these reasons, and in order legitimately to transcend solipsistic consciousness, I had

to devote much space in an attempt to render certain the real existence of a perceptible world subsisting independently of being perceived, a world of extra-conscious, transphenomenal, sense-affecting existents, denied by pure Idealism of all description. The pursuit of natural science without the certainty that the objects of investigation exist independently of the investigator's own casual perceptual awareness of them would be an altogether idle, wasted, unprofitable occupation, which most evidently proves not to be the case.

Having felt compelled, on the strength of direct observations, to renounce the cell-theory, and the purely mechanical interpretation of natural phenomena, and having been furthermore compelled, on the strength of reasoning based on these observations, to renounce philosophical Materialism as well as philosophical Idealism; and having been led to adopt instead a unitary view of the living substance, as being itself a source of intrinsic, forceful modes of activity, and to philosophically insist on the real existence of an extra-conscious realm of power-endowed existents signaled by perceptual modes of awareness; I found myself twenty-five years ago on all sides in opposition to prevailing ways of scientific interpretation. Little wonder then that small attention was paid to such heterodox opinions. However, some leading botanists have on independent lines of research become since likewise aware of the fallacy of the theory of cell-aggregation, and recently experimental ontogenesis has positively demonstrated that the germ-cell cannot be regarded, in keeping with the tenets of the cell-theory, as a mother-cell, whose progeny consists of a series of autonomous daughter-cells; but that all its successive divisions form, on the contrary, comple-

mental parts of a predetermined whole to be developed thereby. As regards the materialistic and purely mechanical interpretation of natural phenomena, principally the views persistently advocated by Ernst Mach have succeeded in convincing many physicists of the existence of modes of energy that are not essentially of a mechanical nature, and also that perceptible objects are not made up of inert material particles. Quite recently the discovery of radio-activity, emanating from certain perceptible bodies, completely upsets the mechanical theory, which takes bodies to consist of inert material atoms actuated *ab extra* by imparted motion or energy.

These recent biological and physical discoveries corroborate essentially the views I have so long advocated and defended in a number of English and German publications, and which are found again reiterated in the present treatise. I am nowise anxious to claim personal credit or acknowledged priority for them. But having devoted a lifetime to disinterested research and study, I rejoice to find — what I, however, never doubted would eventually occur — that weighty conclusions at which I arrived, contrary to accepted views, have now also been reached in independent ways, which goes far to prove their correctness in the present state of scientific knowledge. This opens a reasonable prospect that other connected conclusions advanced by me will prove before long also to lie in the path of scientific progress.

The recognition of another fact regarding the perceptible constitution of the living substance plays also a highly important part in the correct understanding of its intrinsic nature and its functional relations to its environment. The living substance, as I have

clearly demonstrated, assumes, in consequence of its reaction against the disintegrating influences of the medium, a bipolar and bilateral shape. In its primitive forms it possesses already what may rightly be called an oral and an aboral pole, and also axial symmetries of form. How this comes about in connection with the vital movement has been explained in my biological papers. The entire vital labor of the living substance culminates in the formation of its oral or rather its cephalic pole. In this region its chemical structure is of a higher order than at other parts of the body, and it is with the cephalic pole foremost that it moves along through space and meets the brunt of the stimulating influences of the medium. Here in interaction with sundry specific kinds of stimulating influences organs of sense, specifically attuned to them, are found to be gradually elaborated, whereby progressively heightened head-dominion with its increasing sensorial awareness is established in furtherance of the individual's life of outside relations. The next highest part of the living substance in chemical organization and eventual structural elaboration is its general surface of contact with the medium. It is there that the fundamental sense of touch becomes functionally and organically developed into differentiated structural areas.

All these sensory organs, delicately attuned to modes of external stimulation, are contiguously connected with motor organs consisting of contractile substance, which has come to be a specifically differentiated part of the common living substance. The stimuli impinging on the sensory surface set going a train of functional disintegration, whose general effect is physiologically regarded as "irritability," and which in its

motor outcomes becomes greatly magnified on reaching the muscular substance, causing its more or less extensive and intensive contraction. The muscular substance with its structural arrangements and its modes of contraction having been organically developed in connection with the living being's interaction with the medium, executes the definite motor responses to the sensory incitements. The organic elaboration of the sensory organs and their neural extensions and combinations entail a corresponding elaboration of the motor apparatus through which it appropriately responds to the complex sensory stimulation.

The progressive organization of the living substance in interaction with the medium accrues to it from within as a developmental acquisition in furtherance of its life of outside relations. The most essential vital potency in living beings, and that which constitutes them the only veritable substantial existents in nature, is their power to structurally and functionally reintegrate themselves on suffering disintegration from without. Physiologically viewed, life consists essentially in the functional stir set going by external stimulation, entailing structural disintegration, and the following restoration to complete integrity through assimilation of complemental nutritive material. The minutely differentiated stimulating influences incite specific modes of disintegration on impingement. The living substance, responding by definite modes of reintegration, may be reasonably inferred to gain thereby more and more complete attunement to the diverse inciting influences at the points of contact most sensitive to them. As a result of such gradually and toilsomely attained specification, development of the entire living being would seem to be a necessary consequence, its

substance being throughout affected thereby. The advantage gained by such organic elaboration, resulting in attunement to specific stimulating influences, becomes evinced in a more and more distinct and comprehensive sentient information, and more and more appropriate motor reactions in connection with the life of outside relations. In organic beings all structural and all sentient development is instrumental to the life of outside relations. Its special organs form what is called the ectoderm of the animal organism, which being constitutionally bilateral causes the ectodermic organs to be developed in symmetrical pairs. This is not generally the case with the entodermic organs.

Higher animal organisms, although they are essentially integrant units, nevertheless consist of a number of more or less intimately blended zooids, somatic sections, or metameres. From the comparative study of lower forms of life, the association of the more or less independent metameres entering into the constitution of organic beings, may be regarded as originally due to arrested fissiparous division of entire animal individuals, which have become fused together into a complex unitary organism with head-dominion. Various stages of such fusion are met with, especially in worms. But howsoever intimately fused into a single unitary organism, each metamere constitutionally retains some degree of independence as regards its sensori-motor organization and function. This state of things gives rise to reflex actions that may take place independently of head-dominion; but which may also be stimulated to activity by influences originating in the head region, and involving coördinate action of a number of metameres. Each metamere is itself bilaterally divided, each half having its own sensori-motor organ-

ization, but also more or less intimately fused into unity.

In higher animals the sundry sensori-motor connections and further complex communications are established by a system of neural filaments, which at intermodes blend into more highly organized structures, embodying on the sensorial side their conjoint sensorial import, and on the motor side their conjoint motor efficiencies. With the development of each organ of sense in the cephalic region is concomitantly developed a sensori-motor organization of its own, which grows more and more complex and minutely specialized in keeping with the developing complexity of the sensory organ itself. In the course of phyletic elaboration the neural constituents of the different sensory organs blend more or less intimately, forming thereby synthetical neural structures, embodying their combined sensori-motor import. That which is perceptually revealed as sensory organs with their neural belongings are rightly inferred to be of a specifically sentient nature.¹ Normal, and even abnormal, stimuli elicit a specific kind of sensation or mode of responsive awareness. Neural substance has become here specifically attuned to specific modes of stimulation, and responds to them sentiently in specific ways. Its visual response is specifically different from its auditory or from its olfactory response.

The differentiating and specializing process works its organizing elaboration from the surface of contact with the medium, which it minutely subdivides into areas or points attuned to specific stimuli, whence it becomes propagated through neural substance towards

¹ See "The dependence of quality on specific energies." "Mind" January, 1880.

the central or culminating region of the living substance or organism, where all the separately converging specifically elaborated neural elements blend into higher structures. The neural filaments do not run a separate, isolated course from sensory periphery to motor periphery. Nerves are not merely fasciculi of filaments ending each into a separate fiber of a definite muscle. The definite, diversely specific filaments or protoplasmic tendrils on reaching together central regions continue conjointly the elaborating or developing process by means of their functional activity, which process results in the organization of the central living substance into a synthetic embodiment of their conjoint structural and functional import, and the fixation of newly accruing sensorial experience. It is of paramount importance to recognize that all structural and functional elaboration and complication accrues to the one indiscerptible individual within his own living being, as developmental differentiations and specializations of its original morphologically uniform substance, endowed with primitive self-feeling and self-motility. The prevalent biological and philosophical view, that separate sensorial and motor elements are in the course of organic and sentient development mosaic-like pieced together, so as to form differently grouped arrangements, is an out and out mistaken interpretation. All microscopically detectable structural elements have become differentiated and specialized within the unitary living substance as integrant belongings of one and the same organic being, to whom they furnish sentient information, and whom they equip with motor abilities. These latter statements are inferences, not from directly observed processes, but from comparative anatomy and physiology, and from general biological principles.

Life, then, generally held to be some separate, power-endowed entity, actuating from without the organism, which is conceived thereby as a mechanical contrivance, or held sometimes to be attached to elementary units, such as gemmules or biopheres which are believed to compose the organism; or again to be the property of some special chemical compound; "life," vitality, or being alive, is in verity essentially the result from moment to moment of what is scientifically ascertained to be a definite cycle of chemical activity. It is this round of chemical activity which constitutes exclusively the perceptible vital phenomena of the living substance. Death consists, therefore, nowise in the withdrawal of a surmised separate life-principle from the deserted organic mechanism; nor does it primarily consist in the decay of organic substance. It consists in the arrest of the intrinsic activity which constitutes the organism a living substance.

PART II
BIOLOGICAL SOLUTIONS

I. INTRODUCTION

PURE Idealism, be its building material sensations or conceptions, can — as has been shown — in no legitimate way transcend the content of individual consciousness. Its sensations, which are in verity eminently transient modes of awareness, can nowise be rightly hypostasized into permanency as substantial elements of world-construction. This is, however, what sensationalists and associationists are wont to do. As to its concepts, which are really mere empty names when bereft of their implied sensorial connotations, they obviously cannot be rightly postulated as emanating source of these same implied experiential connotations, of which they are mere collective or signalizing modes of apprehension. But this is exactly the arbitrary device resorted to by conceptualists and absolutists.

What consciously appears to each of us in actual awareness forms a unitary, though diversified, ideal structure, of which all diverse constituents are more or less closely and interdependently connected in time and space. They can, therefore, not be segregated from their contexture as self-subsisting, and thus singly hypostasized, without losing their cognitive significance. Moreover, as the content of consciousness makes up only each present moment of awareness, filling thus successively the flowing instants of time with renewed material, it is evidently as phenomenally transient as time itself. Lapsing from moment to moment it has, despite all its wealth of awareness, not

sufficient coherency and permanency in itself to give consistency to any sort of world-fabric, and even if it were one as insubstantial as that which phenomenistic Solipsism offers as true reality. To imagine, — as is the way of transcendental Idealists, — summoned from out its potential latency, all possible content of consciousness fully systematized, and concentrated in the one moment of actual awareness, and furthermore to transubstantialize such mere fiction of plenary phenomenal awareness as real universal Being, or the Absolute; this surely amounts to an exorbitant expansion and deification of denaturalized thought.

It is certain that the conscious content of each successive moment of time cannot possibly be self-originated and self-sustaining, cannot emerge into awareness out of utter vacancy, but must issue from some all-comprising, extra-conscious matrix, bringing thus along with it, consciously resuscitated, systematized information of past experience. The necessarily implied permanent, experience-preserving matrix can, however, not itself be of ideal consistency; for all ideal modes we are cognizant of are mere transient, insubstantial phenomena.

The content of individual consciousness, which constitutes all in all we are in any way actually aware of, and which is the only source from which pure Idealism or any other philosophy can draw material for their world-constructions or world-interpretations, proves thus to consist of nothing but lapsing moments of awareness, containing only ephemeral ideal phenomena. Such actual state of things renders clearly impossible for pure Idealism of any kind legitimately to transcend the utterly secluded sphere of Solipsism; nay to escape complete nihilistic Phenomenalism. For

there is here no permanent substance, no kind of substantial Ego or Subject to support and remember the fleeting phenomenal panorama. Indeed, the existence of real individual beings, or even of a single such being, cannot be admitted by consistent idealistic thinkers. For they must hold, either that what they perceive of other beings and of themselves is nothing but a group of sensations; or that these groups of sensations forming perceptually individualized beings are somehow an illusive outcome of conceptual awareness; or that they have their real being in a hypothetically assumed universal consciousness.

Nihilistic Phenomenalism is the consistent outcome of pure Solipsism. It is, however, too fanciful a position to be seriously held. In fact, nothing can be gained by it, and no advance in knowledge made from it. Where this is attempted, realistic implications are always surreptitiously introduced. Fichte, who tried to construct the world from the solipsistic standpoint, took care to smuggle all possible reality in the premise from which he started. For what more can be needed than an all-creating Ego, in order to evolve from it whatever exists? Still it remains certain that the content of individual consciousness is all that is immediately given and apprehended. So far as we are actually conscious of them, other beings form part of our own individual solipsistic consciousness. In order to impart to the other beings thus perceptually cognized an existence not wholly confined to their ideal appearance in individual consciousness, sundry unwarrantable devices have been resorted to. Descartes invoked as credential of their extra-conscious self-existence the implicit reliability of what is revealed by divine fiat. Spinoza declared them to be special modes of the two

attributes of the absolute Substance constituting our world. Leibnitz maintained that each windowless monad is divinely ordained to cognize, as perception of its own, the being of other monads. Malebranche believed that other beings are directly perceived as subsisting in the divine Substance. Berkeley concluded that they are made by divine fiat to arise as perceptual beings in individual consciousness; and so on. In fine, as formerly shown, no philosophical system has yet succeeded in scientifically, or in merely logically, transcending the rigorous limits of individual consciousness and its subjective Idealism.

It has been here repeatedly maintained that perceptual awareness cannot, as is actually the case in dreams and hallucinations, be originated in real experience without the direct assistance of sense-stimulation. Howsoever richly we may be innately equipped with perceptual faculties, it is an undeniable fact that persons born blind have no experience of the normal content of visual awareness; nor have persons born deaf any experience of the normal content of auditory awareness. And no one who has studied the desolate emptiness of perceptual and therewith of conceptual awareness of deaf and blind persons, and has followed their gradual conceptual enlightenment by means of systematic education through the sense of touch; no one who has given proper attention to this experiment naturally afforded to psychologists, can hesitate for a moment to acknowledge the experiential sensorial origin of vividly definite percepts, and the utter dependence of conceptual knowledge upon the same. Without actual sense-stimulated experience thinking remains a sterile faculty.

Here Kant was certainly right when he emphatically

asserted that conceptual forms are empty and impotent when not furnished with sensorial material to which they can be applied. And who in his sober senses really doubts that this sensorial material is forcibly aroused in us by outside influences, however difficult it may be scientifically to prove the independent existence of these sense-affecting influences, and to form a conception of their intimate nature?

The epistemological and scientific justification for transcending pure Solipsism has been attempted in a previous section. There, among other weighty considerations, it was shown that if we and other beings were really of purely ideal consistency, we would then be as imperceptible to one another as the windowless monads of Leibnitz are held to be. For nothing ideal or psychical is at all perceptible to any outside being. Now, as we actually and most distinctly perceive one another, that which is thus perceptible must necessarily consist of something differing altogether from what we have experience of as being of ideal consistency. This perceptible part of other beings is what we call their body, and if it belongs to living beings also their organism.

That which to ourselves and other percipients becomes thus perceptually revealed as the body or organism proves, on the strength of multifold scientific experience, to be our real being, containing the relatively permanent matrix and source of our transitory but ever-renewed all-revealing conscious content. It is no wonder, then, that the study of the vitality and organization of this perceptible, consciousness-emitting body, yields well-grounded solutions of some of the most enigmatic problems of philosophy, problems impenetrable to mere conceptual probing.

II. SUBSTANTIALITY

IN a former section the problem of substantiality was emphatically declared to be the perennial puzzle and Gordian knot of philosophical interpretation. Students of philosophy will agree with Leibnitz when he asserts that "a correct view of substance is the key to philosophy." They will also agree with Kant who declares "substantiality to be the supreme and first principle of nature, which alone secures unity of experience. For without something permanently abiding amid the flux of temporal changes there could be no synthetical connection and apprehension of natural phenomena."

This being undoubtedly the case, where, then, is this necessarily implied substance to be found that permanently and identically underlies the perpetual flux of phenomenal appearances?

Search after the permanently real which remains one and the same identical substance while nevertheless undergoing or displaying manifold changes; this search after permanency amid change may well be considered the supreme endeavor of philosophical contemplation. How, in truth, can something itself unchangeable be the ground of that which is changing? This fundamental, unyielding difficulty encountered in all attempts at solution of the problem of substantiality proves to be at the bottom of almost all other difficulties met with in the philosophical interpretation of nature. How, indeed, can change proceed from something unchangeable? Or how can

something manifest perceptible changes and yet remain itself unchangeably identical? An unchangeably identical entity can nowise participate in the mutations of that which appears in time. Being itself changeless and timeless it can neither produce nor emanate nor manifest anything that has its existence in time. And without time mutations nothing in nature would ever occur or proceed. There would be no becoming in this world, only eternally one and the same undifferentiated, immutable being or substance. Such an antithetical feat as the combination of identity and change, though regarded as having necessarily to be realized in that which constitutes substantiality; such a coöperation of outright contradictory attributes is logically inconceivable, and therewith conceptually unintelligible. The principle of contradiction is a fundamental axiom of logic, and yet this very combination of the contrary properties of permanency and change, as necessarily attributed in reasoning to one and the same subject or substance, forms the groundwork of all consistent thinking, and of all practical reliance on steadfastness and identity in our world.

Logical thought in its impotence to conceive substantiality as simultaneously possessing these antithetical properties of identity and change, and yet compelled to receive its own validity from this very assumption, reveals its utter dependence on something vastly more steadfast and profound than its own vaunted self-sufficiency. Logical thought proves on this account to be grounded in the extra-consciously sustained identity of the subject of its predications. Extra-consciously sustained this identity of the logical subject must be; for consciously appearing in suc-

cessive moments of time its sense-apparent or thought-conceived permanency and identity can in reality be due only to an identical activity taking place in extra-conscious latency.

The more we get to know of the phenomena of nature, allowing such phenomena to have existence independently of being perceived, the more we become convinced that nothing really permanent and identically abiding is anywhere in its sphere to be detected. Within ourselves the elements that compose our body are found to be subject to constant substitution. And our entire conscious content of the present moment of time, in which all we have of conscious experience rises into actual awareness, is with time itself in constant flux. It is clear, therefore, that the content of a following moment can nowise be the same identical entity as a whole, or in any of its parts, which existed the moment before. Yet, unless certain conscious states are nevertheless conceived as having permanency or as representing somehow existents identically abiding, they could not serve as persistent subjects of which something can be predicated, and consistent thinking would then be impossible. If Socrates is not conceived to be an identical subject persisting as such in successive moments of time, nothing could be predicated of him. Yet all that was actually perceived of Socrates consisted of nothing but transitory modes of awareness.

Logical thinking is thus forced to assume the perduring identity of the constituent of consciousness which it posits as subject of its judgments; while in verity this same constituent of consciousness is as such existentially changing from moment to moment. Reliance on the enduring, extra-conscious identity of

the subject of which something is to be predicated forms the groundwork of all logical thinking. This proves that the predications or judgments of logical thinking refer in reality to modes of existence which have their permanent being beyond the sphere of conscious awareness.

In practical life, without this same reliance on the identical steadfastness of objects perceptually revealed in successive moments of awareness, rational conduct could not be carried on. Yet how can anything within the conscious content of a following moment of awareness bring with it the assurance of the identity of anything revealed in previous moments? This is the great puzzle offered for solution in the problem of substantiality. And it is certain that no purely idealistic philosophy can possibly solve it. For, as that which constitutes ideal existence, all feelings, sensations, perceptions, emotions, thoughts, and intentions, are mere evanescent modes of awareness, it cannot be too often insisted upon that pure Idealism of whatever kind involves necessarily Non-substantialism or nihilistic Phenomenalism.

When a bird flies across our field of vision and we judge it to be red or blue, we do not mean to predicate this special attribute of the transient perceptual bird we are momentarily aware of. We confidently predicate it of a relatively permanent entity, which we unhesitatingly take to exist independently of our perception of it. The perceptual bird that formed part of our conscious content has altogether vanished, and was itself nothing but a "moving picture" due to a great number of retinal moment-photographs and corresponding conscious states, none of which possessed the stability to serve as a substantive subject of which

something could be predicated as the attribute of a perduring being. Without the instinctive inference and its practical verification, that we are predicating attributes, not of transient conscious states, but of permanent subjects that exist independently of our becoming casually aware of them; without this reliance on the extra-conscious stability of consciously represented existents, the consistency and rationality of our percepts and concepts of things and their relations would dissolve into a meaningless chaos of incoherent fleeting phenomena, as is actually the case in maniacal raving.

Now, as all actual awareness consists of a mere succession of conscious flashes, how does it happen that such a mere flux of dwindling phenomena becomes nevertheless synthetized into rationally consistent, identically abiding percepts and concepts representing a cosmos of more or less enduring existents? This is evidently essentially the same problem which Kant vainly sought to solve. How are synthetical propositions yielding generally valid knowledge at all possible, when our entire actual experience consists of nothing but the flowing content of ever-lapsing time? This problem of identity amid change, of substantial existence sustaining the phenomenal play of conscious awareness; this central problem of philosophy, quite impenetrable to logical thinking and yet underlying it, finds its only solution in certain biological processes positively ascertained. This is a fact of paramount importance, whose truth shall presently be demonstrated.

But first, as of utmost consequence to a correct interpretation of nature, the problem of substantiality will justify a more explicit historical elucidation as has been offered in the introductory section.

Heraclitus, finding that all perceptible nature is in constant flux, conceived permanency to have its existence not in any substantial existent, but in a fated rational order maintained in the flow of perceptible mutations. He refrained, however, from trying to explain how a rational order can be self-fated, and how the panorama of fleeting things is really originated and actuated. The Eleatics, on the other hand, arrived at the conclusion that permanent Being really exists as an animated, immutable, and homogeneous spatial plenum, and that the sense-apparent changes are illusive and unreal. For how, they argued, can mutability and manifoldness be conceived as proceeding from an out and out identical and immutable Being? Here we have the logical incompatibility of identity and change already recognized.

But this conception of substantiality as an ever identical and immutable One-and-All, however ingeniously defended, was too paradoxical to gain many adherents. No display of ingenuity can argue away the manifest existence of manifold changing things. In order, then, to harmonize evident change with identical permanency, or the sense-apparent becoming of things with the abiding subsistence of that which underlies all manifoldness and change; in order intelligibly to combine unity and permanency with manifoldness and change, the one homogeneous, spatially extended material substance of the Eleatics was broken up into a plurality of permanent and unchangeable elements, from whose motions, aggregations, and shiftings into definite spatial arrangements the many diverse changing things are then derived.

There remained unsatisfied, however, the quest after that which actuates and directs the motion of the

moving elements, coercing them into the definitely formed aggregations that constitute the diverse perceptible things of our ordered universe. For granting the material elements to be originally moving, no definitely ordered cosmic system could have resulted from a mere fortuitous concourse of moving atoms. Anaxagoras conceived as the implied directing cause of motion a superior, self-moving kind of animated matter, which aimfully imparts motion to the other elements of the world-material, causing them to assume definite configurations. It is still undeniable that mere atomic mechanics, resulting in an ordered cosmos, presupposes design in the prime mover. To such teleologically acting cause of motion or prime mover Anaxagoras gave the name of *νόσ*, conceiving it as a substantial being, possessing a rational nature. Reason was thus identified throughout the entire perceptible world with aimfully moving and directing force; and rational conception came therewith, in consequence, soon to be deemed superior to mere sense-perception. Eventually thought-conception gained complete ascendancy over sense-appearance. But thought and perception were not yet recognized as being of purely ideal nature in contrast to moved matter. They were rather conceived as themselves an outcome of rationally moved matter. The task remained to disentangle conscious perception and conception from the world formed by moved matter.

Protagoras seems to have first recognized the mere individual and subjective nature of perception. He attempted to demonstrate that everything which is consciously apprehended consists of perceptions only. He lost therewith all realistic bearings, and landed in pure Phenomenalism and Skepticism, as must be the

fate of all extreme Sensationalism. For sense-woven perceptions, being mere transient, individual modes of awareness, have neither themselves substantial being, nor can they represent anything universally valid.

In opposition to the sensational Nihilism arrived at by Protagoras, insistence on universally valid truth as norm of the significance of what transiently and subjectively appears, was taken up by Socrates as his life mission. By means of conceptual argumentation he disentangled from the chaos of futile sense-apparent things and events that which can be consistently attributed to such random experience as universally valid and true.

Henceforth universals apprehended by the unifying grasp of conceptual thinking became established among philosophers as the valid ground and constituting essence of the diverse, varying manifold of sense. Under this view, granting universals to possess existential and essential reality or genuine substantiality, it lay in the course of logical thinking to construct conceptual philosophies on the strength of it, which culminated in the postulation of a logical Absolute, or universal Being, identical with the complete essence and source of thought, and therewith of all reality.

But the interminable contention eventually carried on between the Realists and the Nominalists, leading on the side of extreme conceptual Realism to the assumption of an all-comprehending or absolute Being or Substance; and on the side of extreme sensational Nominalism to nihilistic Phenomenalism; besides many intervening views concerning the respective value, priority, and consistency of universals and particulars; such never-ending, never-settled condition of this fundamental philosophical inquiry, argued about by fore-

most thinkers for more than two thousand years, points to the obvious conclusion that the ground of the contention must be wrongly taken.

The obstructions and objections in the way of substantializing the conceptual products and the final Absolute of logical thinking are manifold and insurmountable. To start with, there are here at once encountered the sense-compelling existents of the great outside world of which all perceptible things form part. These vividly manifest existents stubbornly refuse to be conjured away by being reduced to mere sense-woven percepts of the casual subject who may accidentally become aware of them; and, worse still, to be existentially reduced to shadowy ideas of their own self, vaguely hovering in the recesses of conceptual thought. If, however, contrary to every sane consideration, the multitude of perceptible existents composing the universe are held to have their real being in the evanescent percepts forming from time to time part of the individual conscious content of the subject who may just happen to be aware of them; then the question arises: how these perceptual particulars can possibly retain their special characteristics in the process of being assimilated into conceptual thought, whose very nature consists in being purified of sensorial content? If sets of sense-derived particulars and their mutual relations are thus collectively gathered up and conceptually transformed by logical thinking into ideas, then these conceptual products of logical thinking can obviously merely vicariously and symbolically represent the particulars of sense, and the special agreements and distinctions they have in common in actual awareness. And here it is evident and generally admitted that concepts grow more and more attenuated

and devoid of content in proportion as they become more and more comprehensive. They gradually lose on their way towards all-comprehension whatever special content conceptual thought attributed to them at a lower stage of generalization and abstraction, until there remains at last only the empty shadow of universal Being. And it is this emptiest of logical creations which, as already mentioned, is actually made to constitute the All-in-All of absolutist philosophers, declared by them to be identical with a mystical "Nothing," in which all possible existence is nevertheless held potentially to abide in undifferentiated completeness or perfect totality of Being.

If, on the other hand, the reverse process of world-construction is attempted, the process, namely, of making the particulars to be produced, deduced, or in any way existentially or phenomenally derived from universal Being; then, in order plausibly to accomplish this task, individual consciousness, which is our sole source of revelation, has in imagination to be unwarrantably transcended and hypostasized in vacancy, and then not even as its states are actually experienced in successive moments of fragmentary awareness, but as they are held to be in totality potentially contained in their extra-conscious matrix. It is, however, clear and incontestable that conceptual thought in order to constitute universals comprising definite sets of particulars, together with their agreements and differences; that these sets of particulars must first be experientially given. And they can be given only in individual consciousness. They cannot be perceptually realized as constituents of a universal consciousness which is identical with thought, and consequently wholly intensive and purified of sensorial material.

Indeed, has ever any kind of Conceptualism, Panlogism, or idealistic Substantialism succeeded in really showing how the vividly compelled, sense-saturated percepts we are actually aware of can at all be conceptually evolved? And, beyond it, how the sense-compelling existents of the outside world, necessarily implicated in perception, come to be also intrinsically implicated in conception? Sense-revealed living beings are surely real existents, and notwithstanding Berkeley's declaration to the contrary they cannot live on ideal food nor breathe ideal air, nor walk on ideal ground. And their consciousness deprived of all sense-derived content, and of all its reference to extra-conscious existents, if it could still subsist as such, would have as its sole content only purely intensive modes of awareness, devoid of all perceptual information wherewith to guide purposive activities, and to satisfy organic cravings indispensable to life.

Logical thought implies, no doubt, in its concepts more or less distinctly the particulars of which they are the universals, may these be considered as referring to external existents, or to mere percepts consciously representing the same in individual awareness. In every instance they can be only universals comprehending groups and relations of particulars that have been actually experienced. They could not possibly comprehend anything that had never been individually experienced as content of time and space. And here the mysterious connection obtaining between casual, evanescent modes of awareness and the inferred permanent, extra-conscious, all-comprising matrix whence they occasionally and fractionally issue; this puzzling connection of the content of each successive conscious moment with the source from which it all emanates,

is that which has to be explained in the search after true substantiality and identity in thought and being.

A concept, as extant in immediate awareness, consists of a mere sign or name. But these conscious signs or names carry with them out of the individual fund of latent experience into immediate awareness more or less amply and distinctly their implied denotations and connotations. At all events they are understood as representing definite complexes of previous experience, secured as latent, systematized knowledge in the extra-conscious depths of the individual being, who may thereby become more or less definitely aware of such experience. Latent systematized knowledge, potentially subsisting in the extra-conscious matrix of actual awareness, may be rendered more or less distinctly conscious, or may be analytically evolved with the help of the conscious signs or names volitionally employed in relation to it. These signs or names which, as conscious facts, consist of mere apprehended words or their equivalents, receive their significance by becoming somehow extra-consciously connected in a specific manner with definite groups of the latent fund of experience which they denote or connote. They are, therefore, as physical existents, not mere articulated sounds, but are, moreover, effective incitements that summon into actual conscious manifestation the latent, potential knowledge which they symbolically represent, and with which they have been organically connected. But neither in consciousness, where they are mere transient constituents of the content of occasional awareness; nor in extra-conscious latency, where they can be only special links in the organized and systematized fund of potential knowledge; neither in consciousness, nor out of it, can con-

cepts or universals or their verbal signs constitute the substantial ground which in reality contains the particulars which they denote and connote.

This substantial ground can be found only in the common, extra-conscious matrix, whence all constituents of the conscious content issue into awareness. The extra-conscious matrix of the all-revealing conscious content is, however, obviously an individual possession of the conscious subject, and can neither as a whole, nor in any of its parts, be legitimately hypothesized as permanent, universal entity, substance, or being. Moreover, individual consciousness, as repeatedly insisted upon, can become aware only of knowledge previously and gradually acquired. It cannot possibly evolve such knowledge without actual sensorial experience, simply by delving in innate conceptual endowments. Laura Bridgeman, Helen Keller, and in fact all sense-deficient persons clearly and conclusively testify to the impotence of thought when uninformed by sense.

The essential question here is: what the knowledge we are conscious of in our moments of actual individual awareness really signifies? What is it the knowledge of? To what does it ontologically refer? Pure Idealism has to maintain that knowledge is the self-knowledge of the arising modes of awareness, this being the only actual and immediate experience accruing to consciousness. But idealists always surreptitiously introduce some permanent subject or substance as the underlying matrix or source of the conscious emergence of remembered experience. And as regards the objective, universal validity of knowledge, as Kant calls it, pure Idealism, in case it is sufficiently unegoistic to admit the existence of a plurality of perceiv-

ing or at least of thinking beings, can only assert that the individual knowledge of these sundry beings happens to be in agreement because they are all essentially of the same nature, which assertion is indeed perfectly true.

But as knowledge is evidently sense-informed, and as the sensorial information is, moreover, sense-compelled, it follows that one and the same sense-compelling influences have to be inferred as arousing congruent perceptual awareness and congruous modes of its apprehension in all percipients of essentially the same nature. This again involves the conclusion that individual knowledge refers to or is the knowledge of the sense-compelling existents that arouse in us definite modes of awareness. And among these sense-compelling existents our own perceptible being or organism, and that of other like beings, plays here the most important part. Surely, this our own organism, and that of other perceptible beings, cannot possibly consist of mere complexes of ideas as Idealism has consistently to maintain, if for no other reason, of which there are however many, than that ideas are altogether imperceptible.

It is, however, true that the innate potential conceptual and perceptual endowments of our organization are so vastly preponderant over incidental modes of external incitement, and so harmoniously preëstablished in attunement to the same, that they need only be experientially touched off by the stimulating influences, in order to fill our moment of awareness with a wide range of appropriately awakened cognitions and recognitions. And it is furthermore true that our gradually and fractionally gathered conscious experience falls into systematized collective order, is, in fact,

incorporated in due order, in the generically inherited matrix of consciousness, and is as such potentially preserved in the same. It is this organically preserved extra-conscious fund of memorized experience and nowise a preëxistent, super-organic totality of thought which is explored in logical thinking by means of consciousness-awakening signs, and which then serves vicariously and symbolically to represent the world of extra-conscious existents, and their manifold relations to our own extra-conscious being and to one another. It is of these existents and their relations, and not of the phenomenal appearances in the conscious content, that valid judgments are formed for practical and scientific purposes.

Generally admitted, and in fact definitely proved by deaf and blind children is the truth, that without volitional linguistic signs conceptual thinking is impossible. Linguistic signs, however, greatly differ normally in different languages. They are not innately attached to sets of particulars, nor to special concepts which they linguistically express. They become during individual life volitionally and educationally connected with these definite sets of experienced facts. This, obviously, can take place only within the matrix of potential consciousness of the sundry individuals who use these special linguistic signs to designate the experiential facts. If, then, no known rational thinking can take place without linguistic signs, and if linguistic signs differing in kind, and without import in themselves, are by means of education organically welded and assimilated in the matrix of potential knowledge belonging to perceptible human beings, who are thereby rendered capable of rational thinking, it follows incontestably that no rational thinking

can be carried on save by certain perceptible and percipient beings specifically organized, and then only as a result of their social education by means of voluntary linguistic signs expressive of actual experience. Consequently, the thinking substance of the Cartesians, or any other ideally conceived thinking substance, not being a perceptible organism undergoing social linguistic training, and not using socially established linguistic signs, cannot possibly be capable of thinking, cannot be thinking substances or beings. They are, in fact, out and out fictitious entities. The recognition of this evident state of things is of vast import. It proves that rational thought is an endowment exclusively acquired by what are perceived as organically constituted human beings living in social communion.

As regards the innate endowments and preëstablished attunements of that which perceptually appears as the living organism, they manifestly vary much in degree in different organic beings. A chick just escaped from its shell is more efficiently endowed for immediate interaction with the outside world than a mocking-bird just hatched. A Caucasian is innately and generically more highly endowed than an aboriginal Australian; a Caucasian poet or philosopher more highly than a lout or imbecile of the same race. These differences of innate endowment are clearly strictly dependent on organic development. However trivial these truths may appear, they serve to prove the delusive character of pure Idealism, and to point out the genuine substantial source of our consciousness, and the kind of knowledge it normally reveals.

Still, it has to be confessed, that it is only by means of a scientifically grounded epistemology that the real

existence of a transphenomenal, transindividual world outside consciousness can with certainty be legitimately inferred and existentially posited; posited, at least, on the strength of such evidence as amounts almost to positive proof.

With the assistance of such an epistemology it has been here demonstrated that we are justified in inferring from facts of conscious awareness not only the existence of our own organic being and that of a plurality of other organic and percipient beings, but the existence also of an entire extra-conscious world, subsisting independently of being casually perceived by different percipients. And we are likewise justified in holding that the special existent, revealed to our perception as our organism, is the veritable matrix of our transitory, ever-renewed conscious content. To make good the epistemological inference in this special case, supported though it is by much scientific experience, it has to be clearly shown, what ancient and modern philosophy has never succeeded in showing of any substantial existent it has assumed; to show, namely, how the substantial identity of the organism and its matrix of consciousness can permanently be sustained, while it is itself undergoing constant change and emitting an ever-renewed conscious content; to show, in fact, how identity amid change, despite its logical inconceivability, can nevertheless be preserved.

Without positive demonstration, how identity can be maintained under change, how an existent identically abiding can nevertheless undergo mutations, no epistemological or ontological interpretation of actual experience can be truly valid. It has been shown that no kind of pure Idealism can disentangle itself from the insidious meshes of phenomenalist Solip-

sism, and succeed in justifying the assumption of any kind of substantial being. On the strength of its epistemological reasoning and manifold scientific experience, Naturalism maintains here, that the extra-conscious entity which is perceptually revealed as the living organism is in all respects a veritable substance, remaining itself identical and yet manifesting constant changes; that it is in all reality the only genuine substance known in nature. In our world it alone of all revealed existents has power to maintain its identity amid constant mutations and multifold manifestations.

The repugnance generally felt to attribute to the perceptible living substance, called our body or organism, the function of emanating the conscious content, and therewith the entire panorama of what is consciously revealed; this repugnance, arising from idealistic and materialistic views, should be amply counter-balanced by considering through what indirectly incited sensorial signs the existence and characteristics of what we perceive as our organism are symbolically made manifest in conscious awareness. The more minutely the astonishing complexity and intricacy of the organization of the matrix of consciousness are perceptually ascertained as visible brain-structure, the more is there cause to marvel at the exquisitely delicate, minute, and multitudinous means actually present to harbor potentially and to actually manifest our conscious content. Surely, the extra-conscious entity that has power to stimulate our vision in so wondrously specific a manner by constant emanation of correspondingly differentiated stimulating influences may well be held to possess also the power to emanate its own conscious content.

The visible organic commotion we call life, which

is sustaining with its ceaseless activity all structures and all functions of the living individual, reveals in its incomprehensible potency the profoundly mysterious nature of our real extra-conscious being, fully justifying us in regarding it as the veritable source of the flowing phenomena of our conscious content. As organically established and vitally sustained that which is perceptually revealed as neural structure may rightly be considered as potential consciousness. For it is the same vitally sustained structure that, functionally incited, manifests in its bearer the conscious content he becomes in consequence aware of, and simultaneously arouses in outsiders the perception of functional commotion. In vain the wide universe may be searched for any other permanent, substantial matrix of the all-revealing conscious content. Ideal modes of existence have no self-reality. Every ideal manifestation, every sensation, percept, or concept is a mere evanescent phenomenon without a trace of substantial perdurability. The perceiver and thinker himself is hidden in extra-conscious latency. It is only his organized activities that become manifest to himself as perceptions and thoughts. His very existence as a perceptible being becomes revealed to himself only symbolically in his perceptual awareness.

These weighty facts in mind, it will be well to resume our survey of the principal philosophical attempts to conceive true substantiality, being now in a position to point out more clearly their essential fallacies. As products of mere introspective logical thinking philosophical systems fall short on account of the logical impossibility of conceiving how identity can be preserved amid change; how a substance can emit changeful manifestations and yet remain itself un-

changeably one and the same entity. These logically contradictory affirmations, necessarily implied in the conception of substance, and which to reconcile has been the main effort of philosophical contemplation, led, as already stated, early to drastically opposite conclusions in the primitive views of Heraclitus and the Eleatics. The latter could not logically conceive how change can take place in an ever-identical, timeless substance, which, as such, must ever remain immutable and homogeneous. Heraclitus, on the contrary, recognizing universal change as the essential fact in nature, could not logically conceive how the perpetual flux of things can possibly proceed from something itself identically abiding. Later on, when the purely cosmological view became complicated with psychological consideration, the contention regarding the respective merits of conceived substantial identity and actually perceived change, became more and more confined to the relation obtaining between conceptual universals and perceptual particulars. And, despite many centuries of strenuous wrangling about this vexed question, no final decision has yet been reached.

Diverse aspects of Plato's ideal Realism were with varying success opposed to diverse aspects of Nominalism based on Aristotle's categories as predicates of real perceptible existents. Substantial being was attributed by Platonists to ideal universals; by Aristotle it was attributed, on the contrary, to perceptible particulars as material existents. But ideal as well as material substantiality was here only hypothetically assumed without epistemological justification.

Modern philosophy is generally dated from Descartes, for he it was who principally succeeded in breaking the spell under which church-sanctioned authori-

ties kept human thinking in subjection. He was led, on the one hand, by psychological, on the other hand by physical considerations to bisect human nature into two wholly disparate hypothetical substances. He regarded the manifestations which he considered to form part of consciousness, or the ideal sphere, as accidents of a non-extended substance; and those forming part of the world of extended existence, or the material sphere, he regarded as accidents of an unconscious space-filling substance. The former he held to be exclusively the matrix of intensive, psychical modes: the latter the substratum of extended, physical modes. To the former he gave the name of "thinking substance," believing it to be somehow in material touch with the human organism. The latter he named "extended substance," identifying it with material or bodily existence. In consequence of this out and out Dualism, Descartes and his followers found themselves at a loss naturally to account for the evident connection and seeming intercommunication obtaining between the two disparate substances. The intensive modes of the thinking substance could not be rationally conceived as capable of imparting motion to bodily existents. And the bodily or material substance, being capable only of receiving and imparting mechanical modes of motion, proved impotent to influence in any natural manner the purely intensive, ideal modes of the thinking substance. The Cartesians were, therefore, compelled to conclude, that the actually manifest concurrence of specific bodily movements with specifically corresponding psychical states can be only supernaturally effected.

This dualistic puzzle regarding the bond of connection between bodily actions and corresponding men-

tal states has — it will be conceded — remained enigmatic to philosophers and scientists to the present day. But the epistemological insight here arrived at offers, as explained, an easy solution. It shows that what we perceive as our extended organized body and its movements forms just as much part of the ideal content of consciousness as its purely intensive modes. Extension and motion in actual awareness are evidently out and out psychical manifestations. In fact, everything we are conscious of must evidently form part of our conscious content. On the strength of this almost self-evident truth, Berkeley succeeded in wholly and convincingly dissolving Descartes's extended material substance into mere sensorial and perceptual modes of awareness.

The substantiality of material extension being effectively disposed of, it remained for Hume to dispose likewise of the substantiality of the assumed psychical substance. He argued that we are consciously aware only of psychical particulars, at first vividly impressed and then faintly remembered, the bond between them being of purely experiential origin; and that we are nowise justified in concluding that these particular ideal states emanate from a permanent psychical or thinking substance in which they inhere.

Thus were experientially dissipated Descartes's two substances, and there remained in existence only what we are actually aware of, which was declared to be made up of nothing but an insubstantial phantasmagoria of conscious particulars more or less firmly associated. This nominalistic, subjective Idealism, legitimately experiential as it seems, consistently ends in volatilizing the entire universe into a nihilistic play of evanescent appearances, arising from vacancy into

momentary awareness, and as abruptly vanishing again into non-existence. True substantiality was therewith declared to be nowhere found in nature. Hume's teaching was avowedly Non-Substantialism.

As sensorial Phenomenalism is at present gaining ground among thoughtful naturalists, it will be well to expose somewhat more explicitly, than was done before, the manifold fatal inefficiencies of this view. Since Berkeley, it has become evident to most philosophical thinkers that what we actually perceive as the "external world," our own body included, consists altogether of a certain kind of conscious states, known as percepts, which percepts seem themselves to be composed of sensations. Besides this perceptual world, there are experienced other conscious states, such as cravings, feelings, emotions, thoughts, and volitions. These are likewise held by consistent Sensationalists to be sensations, or to be composed of such.

Here the momentous question is: whether the consciously revealed world, admitted by all to be composed of nothing but diverse modes of experienced awareness, is self-existent, self-sustained, and self-actuated; or whether it is, on the contrary, the outcome of the activity of some underlying, extra-conscious, efficient agent, substance, or matrix? Should the former state of things be actually found to be the true state, then we would have to put up with pure Phenomenalism, or Non-Substantialism; if, on the contrary, the latter were found to be the true state, then Transphenomenalism or Substantialism would be the philosophical creed.

Berkeley, who more than Hume may be considered the originator of modern nominalistic Idealism, believed the perceptual world to exist solely as being

perceived by a "mind, spirit, soul, or myself," and that it is this soul or Ego that not only perceives, but also thinks and wills, experiencing therewith the other non-perceptual modes of awareness; being, in truth, the agent or substance manifesting and apprehending the entire conscious content. Berkeley clearly recognized the cardinal fact, partly lost sight of by Hume, and altogether ignored by consistent sensationalists and consistent associationists; the positive fact, namely, that conscious states are themselves "inactive," "passive and fleeting," as Berkeley rightly calls them; that "there is nothing of power or agency included in them"; and that they can nowise "produce each other, or make alterations in one another." Consequently, he rationally infers that an extra-conscious, power-endowed, permanent substance or agent must underlie the forceless, evanescent modes of conscious awareness. This is a cardinal truth which should guide all philosophical interpretations of nature, but which is not recognized by subsequent subjective and nominalistic Idealists, for they attribute permanent substantiality to modes of awareness that are evidently forceless and fleeting.

As to the veritable substance that underlies the conscious panoramic display, only a correct epistemology can point it out. Berkeley assumed without epistemological justification that a psychical, mental, or ideal substance is here the desiderated efficient agent.

Berkeley rightly holds that we individually possess the power to will certain kinds of mental states to consciously arise and to consciously disappear again. He is aware, however, that this power over our "own thoughts" does not extend to what is "perceived by sense," not to the perceptual world. And he rightly concludes that it is essentially by means of such com-

pulsory percepts, arising unwillingly by us, that we gain true experience of what is called the "external world" and "the settled laws of nature." Here the second principal question in the contention between non-substantialism and substantialism comes to light; namely, what kind of influence it is through which the perceptual world makes its appearance in conscious awareness. Is it really sense-compelled by some external influence, as Berkeley and common sense take for granted? Or does it arise into conscious existence uninfluenced by any external agency? Do the elementary sensations of which the perceptual world is believed to be composed come into existence and assume perceptual configuration and order by means of their own? In fine, is the perceptual world self-caused and self-actuated? The latter view is the one that has to be held by consistent nominalistic Idealism. Berkeley, however, in keeping with his view of the inefficacy and fleeting nature of conscious states, and governed by his theological faith, maintains that the perceptual world makes its appearance in individual consciousness, and is actuated therein by the volitional fiat of the Creator.

Consistent sensorial phenomenalism maintains that everything in the world is composed of sensations as elementary constituents; that this is all that is actually found to be present in existence, and has therefore to be taken as such without further inquiry as to where it comes from and how it is actuated. This complacent view is held despite the fact that such a sensorially constituted All-in-All vanishes at times altogether out of conscious existence, and suddenly reappears again. Where, then, has it subsisted in the meantime? To pure sensorial idealism bodies and minds,

generally believed to constitute indiscernible personalities, can be merely definite clusters of self-existent and self-conscious sensations. The feeling of distinct individuality and personal identity is in such a sensorial world obviously an illusion. For the sensorial elements alleged to compose the body are found, physically viewed, to be in constant flux. The present body is not the same body of years ago, or even of yesterday, or of an hour ago. And, as regards that which is called the mind, it is even more changefully composed of varying complexes of sensations than the body, for the constituent elements of the conscious content are changing from moment to moment. Consequently, to consistent Sensationalism the entire universe consciously appearing consists of a vast kaleidoscopically changing panorama, formed of multitudinous sensorial groupings, unperceived, unrecognized, and unwilled by any individuated being; not even — it must be consistently admitted — by the group of sensations that compose the being of the grave philosopher, who by application of much circumspect thought has excogitated this stupendous idealistic phantasmagoria. The whole system of sensorial Phenomenalism explodes as soon as you allow a special group of sensations, the philosopher himself for example, to be a separate substantial entity conscious of the panoramic display of grouped sensations. You then concentrate the entire universe within the exclusive conscious content as outcome of his subjective or individual being. And this is no longer pure sensorial Phenomenalism, but monadic Solipsism. Pure Sensationalism, however, vanishes into thin air, as soon as the utterly insubstantial and wholly evanescent nature of real sensations is recognized; for only by wrongly assuming sensations to be

permanent substantial existents can they be made to serve as building-material in world-construction.

Of course, it lies near that consistent thinkers, who have recognized that the conscious content is the sole actual source of revelation, should attempt to explain or describe nature as really consisting of the conscious states themselves. But conscious states, as Berkeley already clearly recognized, possess no enduring consistency and no sort of efficacy. They are utterly forceless and fleeting. They can, therefore, neither group themselves, nor give rise to changes in the groups, nor, indeed, form any enduring groups at all; for this would presuppose that they remain themselves enduringly identical. It is clear, then, that to conceive sensations as enduring and therefore substantial elements wherewith the universe is constructed, amounts to fictitiously endowing them with an existential nature the very reverse of their own, for nothing could be more insubstantial and ephemeral than sensations are really found to be.

Berkeley, trusting in the assistance of an omnipotent Will, and feeling safely ensconced in his perceptual Phenomenalism, set about refuting a number of objections that can be brought forward against his paradoxical position; among these, the typical one that we cannot possibly be fed and clothed by mere perceptual "victuals and apparels." He contends that the victuals and apparels we are conscious of undeniably consist of percepts and of nothing else, and that it must be, therefore, these very percepts with which we are fed and clothed. In thus boldly insisting upon this unconscionable absurdity, the fundamental insufficiency of his idealistic scheme plainly reveals itself. For he thereby contradicts his own emphatic and

essential doctrine, the doctrine, namely, that percepts have no power whatever to influence and to work changes in and upon one another. This being actually the case, it is rather hard to understand how we can be fed and clothed, how our appetite can be satisfied, and our nakedness covered, by a set of mere percepts, which are wholly powerless and evanescent. We, being mere mental or spiritual existents, consisting of percepts and ideas, as Berkeley maintains, how can we at all be fed and clothed, how can we digest perceptual victuals with spiritual stomachs, and put on perceptual apparel upon our spiritual being with perceptual hands? The spiritists of the present day actually profess to believe in a ghostly world, whose inhabitants are blessed with excellent appetites of all sorts, and are clad in manufactured dry goods. And it must be confessed, that the purely perceptual denizens of dream-land are ghostly beings, formed and clad exactly like the real human vertebrate, and to whom the most marvelous exploits are perfectly natural. Here in dreams, neglecting the dreaming organic being, who may remain unperceived, we have the nearest approach to the self-sustained and self-acting phantasmagoria of pure sensorial Phenomenalism. In the same way, neglecting the organic being of the excogitating philosopher, his idealistic fantasies appear self-sustained and self-actuated.

Berkeley maintains furthermore that compelled percepts are only warning signs; that, for example, "the fire which I see is not the cause of the pain I suffer upon my approaching it, but the mark that forewarns me of it." Forewarns me of what? it must be asked. Evidently that my too close approach to the fire will actually cause me to be burned and to suffer pain in

consequence. But as the perceptual fire has been declared to have no power to affect me in any efficient manner, how can my approach to it bring about "any alteration" in my sensations, how can it efficiently warn me, and, neglecting the warning, how can it cause a burning pain to arise in my consciousness?

Berkeley, strong in his faith in omnipotent Spirit, does not shrink from himself exposing the fatally irrational consequences of perceptual Phenomenalism. It is obviously legitimate to inquire where the perceptual world exists when not actually perceived. He unflinchingly gives the only answer that can be here rightly given. When I shut my eyes, he says, the perceptual universe is in all verity "annihilated," and when I open them again it is instantly "recreated." This startling assertion is indeed applicable to all conscious states. They are, in fact, as such, wholly annihilated when they vanish out of consciousness, and wholly reproduced when their like reissue into conscious awareness. Berkeley, the theologian, attributes this sudden annihilation and re-creation of the perceptual world in individual consciousness to the volitional fiat of the Creator. Epistemological and scientific considerations have rendered it justifiable to attribute the production, vanishment, and reproduction of the conscious content, and therewith of the perceptual world, to the functional activity of our power-endowed, extra-conscious being, perceptually revealed as our living organism, and to seek for the source of perceptual compulsion in sensorial stimulation, emanating from an outside world, to which our own being has in the course of phyletic evolution been out and out organically and functionally adapted.

Another insurmountable difficulty encountered by

such perceptual Phenomenalism, as admits a plurality of percipient human beings, is likewise taken notice of by Berkeley. Other beings evidently cause percepts to arise in us — the percepts, namely, representing their body and its movements. But how can this possibly occur, when Berkeley's spiritual individuals are declared to possess power only "over their own thoughts," and nowise over the world of perceptual compulsion? Here, then, another fatal flaw in perceptual or sensorial Phenomenalism becomes obvious. It is evident and conceded that the soul, mind, or spirit, if it is admitted to really exist, is itself imperceptible. And just as imperceptible to other percipient individuals are the mental states present in any one of them. Now if the individuals themselves consisted of mere percepts or combinations of sensations, as sensorial Phenomenalism asserts, they would then evidently be wholly imperceptible to one another; their perceptual appearance in consciousness, as actually experienced, would be utterly unaccountable and unintelligible, and would then again have to be accepted as a result of supernatural Omnipotence. In real nature, however, it is an undeniable and patent fact, that a human being permanently or casually deprived of sight cannot perceive other beings; that his conscious content is devoid of the compelled perceptual appearances constituting the visual awareness of other human bodies. Is it not, then, as legitimate an inference as can be at all ventured, to conclude that it is by means of definite sight-stimulating influences that the perceptual appearance of other beings arises in conscious awareness? And, as the conscious states experienced by these beings are wholly devoid of sense-stimulating power, it can be only as extra-conscious, power-endowed existents

that they can arouse by means of sense-stimulation their perceptual bodily appearance in the conscious content of the percipient.

But in this argument the substantial existence of the expounding philosopher, and that of other human beings, was assumed contrary to pure sensorial Phenomenalism, which admits no individually enduring and thinking beings. It has to construct its world out of mere grouped sensations, as actually manifest in the conscious content. This all-revealing conscious content being itself, however, altogether forceless and transient, "annihilated" and "recreated" from moment to moment, how can it possibly form a world of any consistency whatever?

Sensorial idealists manage inconsistently to overcome this insurmountable state of things by smuggling coherence and permanency by some underhand means into their wholly untenable system. In order to impart some sort of solidity and stability to it, Berkeley himself relies from within on a consolidating soul or ego, and from without on the fiat of the Creator. Hume, his followers, and all professed phenomenals, derive their necessary supply of coherence and significance principally from "memory," which means from the permanent matrix in which all our conscious experience is potentially contained. By being inevitably obliged to have recourse to the permanent fund of latent experience, they surreptitiously introduce as stable and efficient the rationally desiderated substance that somehow harbors and issues into conscious awareness the entire phenomenal world ready-made. For it is safe to say, that where memory has its latent dwelling-place, there the phenomenal world arising as conscious content is in all verity constituted. It is nowise

put together by any process directly operative among sensations, perceptions, conceptions, or any other constituents of actual awareness. The final outcome of this examination of pure sensorial Phenomenalism or Non-substantialism is emphatically that the real world cannot possibly consist of such stuff as the conscious content or dreams are made of; not of the phenomenal stuff idealism uses for its fanciful constructions.

Previous to Berkeley's nominalistic Idealism and Hume's enunciation of Non-substantialism, Spinoza had attempted to deduce nature from a substantial One-and-All. He sought to prove that Descartes's two substances are mere attributes of one and the same absolute substance, which he conceived as the veritable *ἓν καί πᾶν*. He labored by means of rational demonstration to specifically differentiate, and to set in motion, the out-and-out uniformity and eternal immobility necessarily attaching to a timeless, ever-identical substance. To accomplish this logically impossible task, he attributed — less consistently than the Eleatics — to his absolute substance a fatalistically predestined power of definite self-determination, through which it becomes differentiated into attributes and modes, whose necessity he conceived to be dependent on the unerring perfection of the One-and-All. By means of this assumed self-determining efficiency the absolute substance finds means, however, only to negate its all-comprising, ever-identical perfection, shattering it into inferior modes of existence. With Spinoza "*determinatio est negatio*," which involves a far greater creative fall on the part of the absolute substance, than the biblical one caused by disobedient man.

But, despite an elaborately excogitated series of self-deteriorations, the postulated absolute substance

all too clearly proves to be wholly incompetent to manifest in the remotest degree the vivid facts of actual human experience, which, after all, are the actually given facts to be accounted for. The perceptually extended existents of the physical world, so rich in efficient properties, are with Spinoza essentially mere geometrical figures mutually determining in definite ways their contiguous forms within the absolute attribute of extension. And the impassioned cravings and volitions of our organic nature can be here only necessitated modes of the thought-attribute, that has become somehow particularized within the infinite, all-comprising completeness of the absolute substance.

But how does Spinoza really arrive at his conception of "substance," and how does he manage, despite its eternal, unchangeable identity, to make it plausibly evolve or manifest the multifold physical and psychical phenomena of actual experience? He does so by erroneously identifying logical dependence with causal efficiency, as had been the generally approved method of philosophizing. He believed he had established the real existence of his absolute substance by declaring it to be "self-caused," and then, by aid of his magic formula, "*ratio sine causa*," he evolves from it all consciously experienced phenomena. God-Nature, "*deus sine natura*," or the absolute substance, receives from Spinoza its title to real existence by being self-caused, by being "*causa sui*." But it has since become certain that "cause" is essentially and necessarily a relative term exclusively applicable to occurrences in time, of which there can be conceived no beginning. An occurrence in time cannot possibly cause itself; nor can anything timeless or eternal be conceived as any way caused. The category of causation or becoming can

therefore nowise be legitimately employed to secure the eternal existence of an ontologically posited substance.

Spinoza, having thus by misuse of the category of causation fictitiously established the existence of his absolute substance, conceives it, then, no longer as causatively effective, no longer as "*causa*" but as "*ratio*," or logical ground, containing implicitly all reality, held by Spinoza to consist of infinite possible attributes, "*Deus, sive omnia Dei attributa*." Then, by the same indiscriminate use of the diametrically opposed principles of logical inclusion and efficient causation, he proceeds to differentiate into the definite attributes of thought and extension his unitary, timeless substance, and to causatively actuate their potential modes, by which they are made to manifest themselves as the phenomena of our actually experienced nature.

Fully conceding the lofty character and eminently circumspect acumen of Spinoza's thought, we have from our biological and general scientific standpoint to pronounce his ontological system to be, notwithstanding, only a fervently conceived and sagaciously constructed pantheistic air-castle, illusively solidified by an erroneous conception of universal substantiality. Here is offered as supreme reality an incomprehensible God-Nature self-caused and capable of determining itself in infinite attributive ways, of which two only of these infinitely possible infinite attributes constitute our own universe. This cosmic conception, enthusiastically hailed by poets and philosophers, surpasses indeed in vastness infinitely the one for whose enunciation Giordano Bruno suffered a martyr's death. But Bruno could effectively point to the multitude of blaz-

ing suns as actually existing evidence of his sublime conception; while Spinoza's God-Nature with its infinite attributes has its being only in the utmost logical expansion and saturation of the ideal notion of mathematical and geometrical infinity conceived as self-differentiating entity, with nothing anywhere in nature to testify to its actual existence.

Still more untenable, if possible, is Leibnitz's conception of substantiality. He emphatically declares that a correct view of substance is the key to philosophy. With this declaration one must, indeed, fully agree, and it is to enforce it that these pages are written. Leibnitz, however, conceived substance to consist exclusively of self-acting force or power. He had missed forcible actuation or self-acting power in the two substances of Descartes, and also logically in the absolute substance of Spinoza. To overcome the stagnation and passivity attaching to substance as an ever-identical, unchangeable entity, he fictitiously substantialized and hypostasized under the name of "acting force" the hidden cause of perceived actuation in nature; and with this imaginary abstraction, conceived as an immaterial, psychic potency, with this substantialized concept of bare activity as sole real existent, he set about constructing the universe. As physicist, however, he held inconsistently with his pure Idealism, that the world of extension is made up of inert matter powerless to move itself. And it was on the strength of this materialistic view that he was led to conclude that motion can be originated and directed only in the ideal realm of thought. Casting away, thereupon, his material foothold he proceeded to operate unhampered in a realm of pure ideal subsistence. We meet here again, as all-important, the

insistent need of postulating an efficient cause for perceptible motion and change; this need arising in the present case from the supposition that all extended appearances are material and inert.

To Descartes every kind of conscious or ideal experience was of a purely intensive nature, and he held all its varieties to be modes of a single thinking substance. Leibnitz, in imitation of the atomizing of the Eleatic substance on the part of the ancient physicists, broke up the one thinking substance into a vast multiplicity of individuated thinking atoms. These he called "monads," and held them to be simple substances, formless and indivisible, consisting in fact altogether of ideal, self-acting force. And he declared the entire real universe to be made up as a plenum of such unextended thought-atoms. These purely intensive ideal beings have, according to Leibnitz, no power whatever to affect one another. Nothing from outside can penetrate into the wholly secluded, self-contained nature of these simple monadic substances. They are indestructible entities, conceived, however, as creatively endowed with a vast potential equipment, by dint of which their primordially dormant consciousness gradually awakens, fatalistically to undergo evolution from lowest to ever higher modes of perception, destined finally to reach plenitude of apperception or divine perfection. Their innate monadic function of perception, dim at first, but developing into clear and clearer apperception, is, despite their wholly secluded self-activity, harmoniously preëstablished to mirror more or less distinctly what at the same time is being experienced in all other monads, and therewith in the entire universe.

Such is the gist of the celebrated Monadology, based

on no actual experience, but being only an ingenious attempt to harmonize contending philosophical views, "Plato with Democritus, Aristotle with Descartes, the Scholastics with the Moderns." When closely examined it unfortunately turns out to be but a strange medley of inconsistencies, betraying in Leibnitz also, how speculative license, on the one hand, and scientific restraint and accuracy, on the other hand, can dwell peacefully together in one and the same mind.

To begin with, how can what is named "force," whose existence is merely inferred as the cause of motion and change, — how can it rightly be, more than any other conceptually abstracted inference, declared to be self-acting and to constitute a plurality of substantial, imperishable entities, each intrinsically endowed with a universe of potential thought identical with true reality? Where, it must be asked, can such a world of potential, and eventually of actual thought, have its bidding-place or permanent matrix in something that is nothing but self-acting force? Action is a process in time. Self-acting force must, therefore, necessarily exhaust itself in the production of the content of each moment of time. How, then, can it still endure unexpended as the same identical, all-efficient substance it is declared to be? Here, again, identity and change within the same substance come into irreconcilable conflict. And how can anything extended, anything spatial, be possibly constituted out of unextended, purely intensive entities? How can such wholly unextended entities as the monads, themselves simple and indivisible, have, nevertheless, extended perceptions consisting of a multiplicity of divisible parts? Extended or space-perception is a fundamental conscious experience of each individuated

percipient. Leibnitz, it is true, asserts that extended perception is merely an illusion of confused thought. Still it consists of a multiplicity of parts in extensive juxtaposition, and not in a mere confusion of intensive particulars. No kind of simultaneously perceived multiplicity can find room in a simple, unextended, indivisible, self-acting force. And how can a wholly self-secluded monad know, or even legitimately infer, that there exist other monads beside itself? And how can it know that there exists a universe other than the one it is itself evolving as its own thought? In the same sense, how can a monad legitimately infer that it has a quasi extended body somehow connected with its own unextended nature — a body which consists of a vast aggregate (!) of other inferior monads, of which it is the central governing monad, though it can nowise influence them, nor be itself in any wise affected by their presence? And how can such a space-occupying organic body at all result, and be formed, by an accumulation of ever so vast a number of "formless" mathematical points, which the monads, spatially considered, evidently are?

This hopeless conglomeration of incompatible conceptions advanced by the great Leibnitz as supreme philosophical wisdom, and accepted as such by many followers, affords a most striking example of the truth of his own saying, namely, that a correct view of substance is the key to philosophy. This truth necessarily involves as its counterpart, that an incorrect view of substance is apt to lead even the most profound thinkers egregiously astray. Leibnitz, besides overlooking the fundamental truth, that an ideal force-substance, no more than any other force or substance, can spend itself in action and yet remain the same

undiminished identical being — besides stranding on this perennial philosophical reef, he is essentially and wrongly influenced by the Cartesian dualism of thought as purely intensive or unextended; and its reverse: a world of external, extended things. This same dualism has ever since played perhaps the most perplexing part in attempts to interpret nature. As repeatedly stated here, and in former publications, this seeming irreconcilable duality and disparity of intensive thought and extended things quickly vanish by recognizing that what is experienced as extended things are really extended percepts, and therefore themselves modes of thought in the Cartesian sense. Thought and extension, inclusive of sensation and motion, are, as modes of awareness, of one and the same ideal and conscious nature. They are all alike mere transient phenomena, which, as such, can nowise constitute permanent substances; neither a thinking substance, nor an extended substance, nor a force-substance, nor any kind of all-comprising ideal substance.

Kant had learned from Hume, that actual instructive experience cannot be gained by mere logical thinking; that perceptual particulars are sense-derived; and that knowledge cannot be deduced from originally ready-made concepts through mere analytical extraction, nor ground out by a conceptual machine, as Leibnitz and some of his followers actually believed. Kant recognized, that, if sense-material has not on previous occasions been actually given and experienced as "matter of fact," conceptual thinking remains impotent and empty, having no material to work upon. He, moreover, emphatically, almost passionately, believed, in outright opposition to pure Idealism, that sense material experientially arising in consciousness is an

outcome of external influences affecting our modes of sensibility. He never realized that Hume's experiential and sensorial "matter of fact" is of purely subjective or ideal origin and import, that his system is pure subjective Idealism. Nor did he realize that Leibnitz's universe of monads is likewise of purely ideal consistency; a world altogether thought-woven by each separate monad.¹ Berkeley's perceptual idealism struck him as unconscionably fantastic.

But with all his fixed belief in sense-affecting things-in-themselves, how did Kant, in his turn, succeed in breaking through the charmed circle of individual awareness or phenomenal Solipsism? Did he ever manage to alight sound and safe in the universe of real substantial subsistence? Let us see. On the sensorial side he took the existence of sense-affecting things-in-themselves simply for granted, without epistemological proof or demonstration, and without attributing to them any specific characteristics, or specific sense-arousing qualifications. They remained, therefore, wholly unknown inferential existents, left entirely out-

¹ In "Ueber eine Entdeckung zur Kritik der reinen Vernunft," Ed. Rosenk Volt, p. 480. Kant says: "Is it possible to believe that Leibnitz understood under preëstablished harmony the coinciding of two beings totally independent of each other in their nature, and not to be brought into communion with each other through their own powers? That would be indeed enunciating Idealism; for why should one at all assume bodies, if it is possible to view everything that occurs in the soul as effect of its own powers, which it would exert just the same when perfectly isolated?" (My own translation). Kant wrote this, 1790, when he was sixty-six years old. It shows how pure Idealism remained to the last foreign to his conviction. Yet the consistent outcome of his "Erkenntnisslehre" is pure idealistic Solipsism, involving in its inconsistencies pure transcendental Idealism, for his noumenal world, of which the things-in-themselves form part, is of purely ideal consistency.

side his construction of experienced nature, nowise to be further taken account of. Consequently no escape from Solipsism is effected on the sensorial side. On the conceptual side, Kant declared his categories to be immanent modes of comprising the randomly arising sensorial material under the "synthetical unity of apperception." They are admittedly powerless to attain knowledge of a world transcending that which is phenomenally given and apprehended in individual awareness. "*Noumenorum non datur scientia*" is the essential final conclusion of Kant's critical philosophy. Sensorial material worked up by the categories, through which nature becomes constituted, and with it, in fact, all possible knowledge is attained within individual consciousness. Consequently, neither on the conceptual side does Kant's "transcendental Idealism" succeed in effecting an escape from pure phenomenal Solipsism, which is irrevocably the consistent outcome of his system. There is no legitimate warrant whatever for his problematic transcendence of individual Phenomenalism, which he nevertheless attempts by aid of an hypothetically posited "intelligible Ego" bearing a universally valid consciousness, and asserted to belong to a transphenomenal, noumenal world, of which nothing at all is really known.

Kant's category of substantiality, whose application or function is strictly confined to the conceptual comprising and unification of sense-given material, is declared to afford identically coherent support to phenomenal changes. "Despite all change manifest in appearances the underlying substance persists, and its quantum in nature suffers neither augmentation nor diminution." This is how Kant formulates his principle of substantiality. In doing this he had evidently

the matter of natural science in mind. But how can a mere conceptual category, which that of substance like all others is here held to be — how can it possibly form a material quantum in nature, which suffers neither augmentation nor diminution? Surely it is no sufficient justification for attributing quantity to substance simply because its conception as identical and unchangeable involves conservation of its being. The quantum of a synthetizing concept is something unthinkable.

Kant recognizes that all conscious states are appearances in time, and must therefore be in constant flux. And as the conscious content of flowing time proves collectively, nevertheless, to constitute a synthetic unity, and as it cannot arise out of nothing, something persisting must be the substratum or matrix, which imparts to it the synthetic permanence and unity, with which it subsequently issues into awareness as memorized experience. Conscious appearances are, therefore, the fleeting, changeful outcomes or "accidents" of a perduring, identical substance. So far Kant is in perfect agreement with the view here advocated; only that he takes wrongly for granted that the underlying substance can itself remain identical or unchanged, while manifesting changeful accidents. The continual flow of conscious appearances must indeed issue from some permanent matrix or substance, of which they are transitory outcomes. But, strange to say, Kant identifies the perdurable substance inferred to be the substratum or matrix of the conscious appearances that arise within subjective space; he identifies it virtually with what is called "matter" in natural science. This matter he declares to be the substance harboring and issuing all spatial appearances. These being,

however, admittedly wholly individual perceptual appearances, or mere subjective phenomena, and all construction of nature taking place within the phenomenal world of subjective consciousness, Kant holds in consequence the material substratum, said to underly and to impart unity to the sensorial manifold, to be likewise only of ideal or phenomenal nature. For this reason he calls it "*substantia phenomenon*." But, as such, it can obviously not be identified with the matter of natural science, whose quantum neither augments nor diminishes. To allow perceptual appearances to arise from, and to be supported by, the matter of natural science would be, indeed, Materialism of the crassest kind, a view which Kant was far from entertaining. According to his teaching, the incoherently given and flowing material within our spatial sense receives that which steadfastly underlies its synthetized appearance and conception from being subsumed under the category of substantiality. And it is said to attain thereby objective and universal validity. But, surely, it is nowise intelligible how a permanent unchanging substantial quantum can by means of conceptual elaboration impart coherency to sensorial material, which as content of time is in constant flux. And it is also unintelligible how a process of conceptual elaboration, taking place altogether within the individual's consciousness, can impart to its subjective product objective and universal validity. Substantiality within the world of consciousness, "*substantia phenomenon*," as Kant calls it, turns out to be a wholly fictitious conception. Within the sphere of phenomenal or conscious existence nothing substantial can have any being.

Nothing more tenable can be asserted of Kant's "*substantia noumenon*." Aware that all his concep-

tual elaboration of sensorial material results only in phenomenal appearances, he feels urged to seek a real substantial support for his categories and their phenomenal outcomes. In order to impart true reality to that which underlies phenomenal appearances he has, however, necessarily to transcend the conscious play of individual awareness. For in actual awareness all is individual, subjective, and transient. To force an entrance into the realm of permanent, transphenomenal being, Kant has recourse to a very questionable procedure. He ontologically assumes that the categories are binding to every kind of consciousness, whether human or not. He concludes that they are necessary modes of universal consciousness, of "Bewusstsein überhaupt." And this general consciousness with its universally valid synthetic unity of apperception serves him as a plausible means to transfer all true reality and all synthetizing power to a supernatural realm of purely intelligible subsistence. Into this "transcendent," supernatural sphere he hypostasizes our natural being under the name of "intelligible Ego." And in this exalted region, inaccessible to human awareness, he believes this our intelligible, veritable Ego to have its existence, as a timeless, spaceless, purely ideal, and yet all-efficient "*substantia noumenon*." The central dilemma of the problem of substantiality, the dilemma, namely, how a timeless, spaceless, identical being can possibly emit the flow of temporal appearances, remains here as enigmatic as in all other philosophical systems. The ultimate speculative withdrawal by Kant of necessarily inferred substantiality into a timeless, spaceless sphere of arbitrarily assumed supernatural subsistence amounts to a full confession, that genuine substantiality, or the harboring, issuing,

and actuating matrix of that which is consciously and phenomenally revealed, is in Kant's view nowhere to be found in nature itself. The problem of substantiality is therewith virtually declared to be philosophically and scientifically insoluble by the most circumspect and profound of modern thinkers.

Kant's idealistic followers, Schelling, Fichte, Hegel, Schopenhauer, and their numerous disciples, boldly postulate, and ontologically substantialize as all-efficient entity, some characteristic, or some constituent, of our individual experience as given in the all-revealing conscious content, such as its subject-object significance, its effective volition, its conceptual thought, its affective emotions. And they, then, rationally or "irrationally" attempt to deduce or derive from such potentialized abstractions the entire world of actual experience. Science cannot sanction such arbitrary procedure, howsoever ingeniously carried out. Moreover, and quite essentially, in none of these manifold and multifold attempts at reaching real substantiality is to be found the remotest explanation of the principal dilemma of the problem; namely, how a substantial entity, be it even one of the fictitious and dogmatic sort posited by philosophers — how it can remain identical whilst undergoing or manifesting change; how its inferred permanent and timeless being can come to issue a succession of temporal appearances? This fundamental dilemma has been the fatal stumbling-block of every philosophical interpretation of natural phenomena from the time of the Eleatics up to the present day.

This rather lengthy discussion of the essential points in the sundry views of substantiality entertained by some of the foremost philosophers; views recognized

by themselves as the very focus of their thought, from which all interpretation of nature consistently irradiates, and towards which it converges; this critical discussion was here entered upon to show conclusively that the central problem of substantiality cannot be solved by mere logical thinking, nor by ontological assumptions. But, before a positive conciliation can be attained between the logically antithetical properties of identity and change, of timelessness and temporality, as belonging to one and the same entity, and as constituting a genuine substance; before this conciliation can be proved to be actually effected, — all philosophy must necessarily rest on an unsound foundation. For it remains, then, wholly enigmatic from what permanent and identically sustained source or matrix our all-revealing, but constantly changing conscious content issues into awareness. And it is clear, that without such substantial source or matrix the conscious content itself would arise out of nothingness and revert into nothingness, which amounts to pure phenomenalist Nihilism.

The entire history of philosophy records essentially a vain search after genuine substantiality. Where, then, is it to be found? Where can we discern the veritable substance in nature that undergoes or manifests changes and yet remains identical; that is, in fact, the identically abiding source or matrix of the multifold flowing phenomena of the nature we are conscious of? It cannot be found in the matter of natural science, for it is held to consist of elements that undergo themselves no change. It cannot be found in anything possessing the nature of conscious, mental, or ideal states, for these are obviously all phenomenal and transient. It cannot be found in motion,

force, or energy as sometimes supposed by philosophers and naturalists, for "motion" is a mere perceptual sign of activity in nature, "force" the mere inferred cause of what is perceived as imparted and accelerated motion, and "energy" the mere hypostasized measurable effect of actuation among perceptible objects.

Within the whole range of actual experience there has, as yet, no identically abiding substance been scientifically detected, as source whence the flux of natural phenomena we are actually conscious of can possibly emanate. The truth is we are scientifically investigating and philosophically interpreting nothing but evanescent subjective phenomena, which, however, happen nevertheless in some as yet unexplained way practically to stand for persistent, orderly, and objective occurrences. The actually experienced steadfast, systematic, and generally valid significance of in fact transient, incidental, and individual experience constitutes the hitherto unsolved problem of genuine substantiality. How can a flowing, ever changing conscious content reveal a steadfast, abiding nature?

It is clear that without positive demonstration of the real presence, and the knowledge of the properties belonging to the veritable substance or matrix whence our conscious content issues into awareness — that without such objective information of its existence and characteristics no philosophic nor scientific interpretation of nature can amount to more than a mere description of the phenomenal panorama arising from moment to moment in individual consciousness, scientifically supplemented, however, by the highly important measurement of the dimensions and interdependent movements of its spatial appearances. Of course, such seemingly pure phenomenalist interpretation cannot be really

carried out; for it presupposes as realizing conscious agent, and as means of its procedure, an infinitely more substantial groundwork than is here theoretically taken notice of.

Disconcerted by the fancifulness and inadequacy of hypothetical assumptions, and fascinated by the philosophical recognition, that only the direct content of consciousness affords actual experience — everything transcending it being metaphysical, and therewith inferential and problematical — fascinated by this out-and-out idealistic view, scientists in growing numbers are resigning themselves to look upon solipsistic Phenomenalism as the only possible goal of a scientific interpretation of nature founded on positively and directly given facts. They aim to purify science of all metaphysical presuppositions and conclusions, and to take account only of what is actually given in consciousness, regardless of transphenomenal implications. Guided by this view, they fail to recognize that science cannot take the least step without such metaphysical presupposition. First of all, it presupposes tacitly the entire transphenomenal being of the scientist himself. But even leaving him out of consideration, taking his perceiving, thinking, and investigating faculties, together with what perceptually appears as his organism, for granted, there is found directly given in his conscious content nothing but an insubstantial play of evanescent modes of awareness. And this is the only available material at the disposal of philosophy and science.

The sensations which the scientist experiences are eminently futile. A sight, a touch, a taste are wholly evanescent modes of awareness, which exist only so long as they are forming part of the conscious content.

If he, nevertheless, in his imaginary sensorial constructions attributes to them, and to the percepts composed of them, any permanency, he is straightway guilty of a metaphysical assumption, and here of a purely fictitious one; without which assumption, however, he can construct nothing in the least enduring and coherent. The sense-woven percepts which issue ready-made into spatial awareness on visual and tactual incitement, and which are the immediate objects of physical investigation, vanish forthwith out of conscious existence, whenever we divert our attention from them. Where, then, do they enduringly subsist? If they at all endure, they can only subsist potentially, and therewith metaphysically, in extra-conscious latency. It is true the scientist finds himself able to apply to perceptual appearances sundry ingenious modes of measurement. But this highly important performance is rendered possible only by its taking place on a persistent metaphysical and substantial background of identical activity. For the perceptual appearances he is apparently measuring are themselves continuously moving phenomena in time, without the least staying quality of their own. If the underlying substance or matrix whence they issue were not through persistent identical activity emitting the same kind of flowing perceptual appearances, insuring thereby their phenomenal stability, no seemingly identical percept in phenomenal repose could possibly be apprehended, investigated, and measured. Of course, an indispensable condition is, furthermore, that the stimulating, sense-compelling influences remain likewise identical during the process, or are undergoing definite changes, measurable in the corresponding changes of the perceptual appearances.

As to the scientifically generalized conceptions re-

garding what is consciously revealed, they cannot really apply to mere appearances within the conscious content; for these, one and all, possess no trace of existential persistence, no more than time itself of which they are a transient content, or rather which they themselves subjectively and flowingly constitute on a foil of enduring memory. The generalities of science must then evidently apply to metaphysical entities and their perceptible activities. Finally, when a number of scientists are said to verify results of investigation in order to obtain objectively valid information, do these sundry scientists and their activities, together with the plurality of objects they are investigating, possess no other existence and reality than that which they receive in the single solipsistic conscious content which happens at the time being to become aware of it all, by means of collective and representative signs of purely symbolical significance? And this is, in fact, what subjective Idealism has to maintain.

It is, indeed, certain that everything each of us in this world is any way conscious of becomes solely revealed in our successive moments of actual awareness. Whence, then, this all-revealing flow of conscious states? Conscious experience accrues to us, moreover, during our lifetime casually and piecemeal in lapsing moments of actual awareness. Where, then, is to be found the matrix in which it nevertheless becomes potentially preserved and rationally systematized, so as to reissue into actual awareness on future occasions, but then as integrated part of consolidated knowledge, fit for practical guidance in the conduct of life?

The answer to these fundamental questions, though they are philosophically knotty in the extreme, lies in a general way near at hand. For the harboring and

issuing matrix of the all-revealing conscious content has, as has been epistemologically shown, its seat in the extra-conscious existent that is perceptually appearing as our bodily organism. No one has ever seriously doubted that he has a body which incorporates his individual being, and whose vital activities sustain his life with all its mental and bodily functions. Yet, taking, as is usually done, the body we perceive to be an external material existent, it becomes therewith wholly unintelligible how such an existent, held to consist of inert material particles, can be the matrix of potential mind, and how its functional activity, which would then be of a purely mechanical nature, can give rise to the succession of the conscious states which issues into actual awareness. But if the body we perceive is not an external material existent, of what does it then really consist?

It has been epistemologically shown, that the body we actually perceive as our own, together with all other perceived bodies, are solely appearances in the medium of our perceptual awareness, and consist, therefore, as such, of nothing but transient phenomenal appearances, and nowise of material particles. But it becomes, in its turn, wholly unintelligible how such a perceptual body, consisting of nothing but transient modes of awareness, can constitute a permanent existent, containing the matrix of the entire conscious content, of which the perceived body forms itself only an occasional fragment?

A legitimate escape from this perplexing dilemma, with its materialistic and idealistic horn, has been attempted in the epistemological discussion. It was found, that we are fully justified in concluding that what is perceptually revealed as our bodily organism

is a reliable symbolical representation in conscious terms or signs of a relatively permanent, extra-conscious existent, which is standing in manifold effective relations to other extra-conscious existents perceived as its natural medium. Only under the epistemologically justified inference that the organic being is a relatively permanent existent, subsisting independently of being casually revealed in the perceptual awareness of who happens at the time being to observe it; only under this always tacitly accepted supposition does biology gain the significance of an objectively valid science; and only under this condition can the Nihilism of solipsistic Phenomenalism be overcome in which our science and philosophy find themselves at present inextricably involved. If the real objects under investigation consisted only of the transient phenomenal display within the observer's own individual awareness, having no reference to any real and enduring existence beyond, then physics and biology as objective sciences, or as a consistent system of verifiable knowledge, would be altogether impossible. Each separate observer, for instance, in studying the characteristic features and functions belonging to a specimen of the same kind of real organism, is indeed studying it in the symbolical medium of his exclusive individual awareness, mostly in the medium of his perceptual vision. This perceptual vision he finds to be strictly compelled in its minutest details of figuration and movement by his intentionally directed exposure to definite sense-affecting influences, which are rightly inferred to be emanating from a permanent, extra-conscious organic being. If the definite perceptual awareness which is considered to take place in each of a number of separate observers were not aroused in

each case by specific influences emanating from whatever specimen of the same kind of extra-conscious being that may at the time being be observed, there would be here in existence, under the purely idealistic view, nothing but the perceptual, conceptual, and imaginative awareness of one single conscious content. All postulated observers, believed to have separate existences, and to be corroborating at a distance from one another facts to be gained by the observation of different specimens of the same kind of organism; all these observers, together with their individual experience, would then exist solely as unaccountably arising more or less vividly in the imagination of the one solipsistic conscious content actually aware of it all. This fantastic state of things necessarily advocated by pure Idealism would obviously render impossible the formulation of any objectively valid science, and, indeed, of conceiving any rational view of consciously revealed existence in general. Nevertheless, strange to say, such solipsistic Idealism is a view at present adopted by a number of prominent scientists.

We undeniably gain our objectively valid knowledge by taking — in the case in question, for instance — the perceptually revealed organism in all its details of structure and function to be a reliable symbolical representation of the characteristics and activities of a permanent, extra-conscious being; a being that exists independently of being perceived by the present observer, and which can be itself, or other specimens of the same kind, likewise perceived by a number of other real percipients. These realistic inferences, though they may be called "metaphysical," are unhesitatingly believed in and acted upon by all sane human beings, and have been here sufficiently shown to be epistemo-

logically justified. They form the indispensable groundwork of all objective science.

The extra-conscious, power-endowed existent perceptually revealed as the living organism, is found physically to be constantly changing, and psychically to emanate from moment to moment the all-revealing conscious content. How does it manage, while thus involved in a whirl of change, nevertheless, to remain essentially identical? How, in fact, does it come to constitute the veritable substance of which philosophy and science have been so long in search of; the substance harboring and issuing into actual awareness the all-revealing conscious content, and with it the entire nature we are directly conscious of?

The solution of the enigma of substantiality, of identity amid change, is to be found in a biological occurrence positively demonstrated, which completely reconciles the logically contradictory attributes of identity and change. In the living substance, of which all organisms consist, is actually brought about the coexistence in one and the same entity of the contradictory attributes of persistency and change, of undiminished identity maintained amid constant expenditure. It is the same process in which life itself essentially consists which also endows it concomitantly with genuine substantiality, which secures amid constant change the essential identity of the living being and its manifest functions. No function of the living being, be it physical or psychical, can take place without a corresponding expenditure and waste of the functioning structure. If its impaired integrity were not made whole again, its functioning capacity would necessarily deteriorate and be soon completely exhausted, under simultaneous disintegration of the

underlying structure. To be able adequately to perform its normal function over and over again, and not become organically impaired, the functioning structure has necessarily to be kept intact through reintegration. And so has the entire living being in order to remain identically itself, despite the constant changes it is undergoing.

This structural reintegration to identical consistency and capacity, while spending itself in multifold functional activity, is that in which the life of the organism essentially consists, and which constitutes it a genuine substance; in fact, the only genuine substance we have at all knowledge of. For all other so-called substances, when they suffer change, lose thereby their identity, becoming something different by force of the change, and remaining so afterwards. Now it is clearly this reintegration to substantial identity following upon functional disintegration, which empowers the living being to preserve in its wholeness the subtly organized consistency of the harboring and issuing matrix of the conscious content, enabling it to emit in successive, ever-renewed moments of awareness memorized and systematized experience.

Without being thus issued into manifest awareness from an identically abiding matrix of potential consciousness, experience, if at all possible, would be utterly chaotic. No seemingly enduring identity of percepts in successive moments of time, and no memorized recognition of the same, could at all take place, and therewith no perceptual awareness of the phenomenal world as a coherent and consistent whole; in fact, no kind of remembering and remembered consciousness extending beyond a meaningless, truncated content of the present moment of awareness. The

steadfast, orderly world we are conscious of is absolutely dependent on specific organization of the living substance persistently maintained by adequate reintegration, following the disintegration necessarily involved in functional activity.¹

Genuine substantiality, then, sought for by philosophy and science as that which identically endures, while manifesting the changeful panorama of the world we are conscious of; this genuine substantiality is actually and positively found incorporated in the vitally functioning organization of that which is perceptually revealed as the "living substance," and nowhere else in existence.²

¹ See "The Substantiality of Life," "Mind," 1881.

² On the strength of epistemological considerations the conscious content was found to be a function of what is perceptually revealed as neural structure. As the question of mind being a function of the brain has played perhaps the most conspicuous part in scientific and philosophical discussions; and whereas its misinterpretation has given rise to materialistic views on the one hand, and to idealistic views on the other hand, it will be well to place this much vexed question once more in a clear light.

When in the middle of last century German materialists, reviving eighteenth century views, horrified the world by declaring that the brain secretes thoughts in the same way as the liver secretes bile; and the contention thereupon raged between "Koehlerglaube und Wissenschaft," no remotest satisfactory understanding was reached at the time. In its simplest expression the contention was made to turn upon the relation of motion to sensation. Motion as motility was declared by physiologists to be a function of the muscular system, sensation a function of the neural system. The materialistic contention in this form, though not essentially differing from that which gave so much public offense, appeared more plausible and less debatable. Yet on close scrutiny it was found to be wholly unintelligible, how sensation, which cannot be denied to be a psychical phenomenon, can possibly be the functional outcome of a material neural substance. And so the matter rested. "Ignorabimus" seemed to be here the final verdict. Scientists and philosophers, who were not wholly one-sided materialists or

idealists had to content themselves with psycho-physical Parallelism, a dualism as trenchant as that of Descartes.

By recognizing, however, that what is actually perceived as matter and motion, and therewith as brain and its physiological function forms part of the conscious content of the observer who is actually aware of it; by recognizing this fact, it is found to be all of psychical and nowise of material consistency. Under this view the dualism of brain and mind, or motion and sensation, resolves itself in the first instance into pure psychical Monism. For everything here consciously revealed takes place exclusively within the conscious content of the individual who is aware of it all. The perceived matter and motion, the observed organism and its functions, form just as much part of his conscious content as his thoughts and emotions.

But on further consideration such psychical Monism turns out to be demonstrably untenable, as soon as the existence of a plurality of percipient beings is admitted. The observer perceives indeed distinctly, as forming part of his conscious content, my organism with its movements, and all other functional outcomes, such as bile-secretion. But he is nowise in the same way directly aware of anything forming part of my own consciousness; nor am I directly aware of anything forming part of his own consciousness.

Evidently what he perceives as my organism and its functions, which as such is forming part of his own conscious content, cannot possibly be anything really belonging to me. If it has at all anything to do with me, it can only perceptually reveal to him the presence and certain activities of my extra-conscious being. Extra-conscious my perceptible being has to be called, because nothing forming part of my consciousness is at all perceptible to him or to any other being beside myself. My own conscious content rises within myself into actual awareness as a direct function or activity of the extra-conscious matrix which potentially contains it, and which is forming part of my extra-conscious being. This extra-conscious being, as a whole, has power to stimulate in certain definite ways the senses of outside observers, whereupon its vivid perceptual representation in all its details of structure and function makes its appearance as part of the conscious content of each observer.

That which is thus perceptually revealed to outside observers as an organism and its functions, constitutes the direct object of anatomical and physiological research; while my own conscious content constitutes the direct object of psychological research, whose phenomena are, however, found to correspond strictly to the observer's awareness of definite modes of brain-function. What is consciously perceived by the observer, and what in correspon-

dence with it is consciously experienced by myself, are all alike psychological phenomena; but the former are sense-stimulated, and may be perceived by any number of outside percipients, while the latter are intrinsically arising within myself exclusively as direct outcome of the activity of my extra-conscious being.

To revert to the materialistic contention, that the brain secretes thoughts, just as the liver secretes bile; the truth is that the physiological observer actually perceives the liver, as thus forming part of his conscious content, secreting bile. All this conscious occurrence takes place within his own awareness. But he does not see the brain forming likewise part of his own conscious content secrete the thoughts which on functional activity arise exclusively within myself and of which he remains wholly unconscious. He becomes conscious, however, of the same activity which causes thoughts to arise within myself, but only in a round-about, sense-stimulated way, as functional commotion within the perceptual brain forming part of his conscious content.

III. CAUSATION.

WHEN seriously contemplated it must appear almost self-evident, that all we are consciously aware of forms, as such, part of what we recognize as our own conscious content. And it is quite as certain that this all-revealing consciousness issues into actually experienced existence as the content of what is called "time," and that it is therefore as flowing and lapsing as time itself. It follows, as repeatedly insisted upon, and as being of utmost importance, that all we immediately experience in conscious awareness accrues to us in the one moment of time we call the "present." Consequently, the entire actual awareness of what constitutes our own being, and that of other existents, is, as such, a mere transitory, though continuously renewed and amplified phenomenal revelation. The content of the present moment of awareness yields, then, our only source of conscious revelation. The philosophical and scientific interpretation of nature has no other directly given material to work upon in its attempt to disclose the realistic implications of this phenomenal display of transient modes of awareness.

In examining the nature of "Substance" it was shown that the existence of an identically enduring matrix, underlying and manifesting the transient phenomena of actual awareness, is necessarily and rationally inferred in compliance with the supreme axiom of coherent and consistent philosophical as well as scientific thinking; the axiom, namely, that "*ex nihilo nihil*

fit." No thinker who has ever attempted to demonstrate the self-existence of the conscious content as a whole, or that of any of its constituents, has ever plausibly succeeded in this more than rope-of-sand undertaking without surreptitiously presupposing somewhere in extra-conscious latency a substantial matrix of the flowing and fleeting conscious phenomena. This matrix is generally conceived by experientialists as what is known as "memory," and by transcendental Idealists as what they posit as "universal reason," "intelligence," or the "Absolute."

Leibnitz, who looked upon the conscious content as a gradual evolution towards complete divine apperception, hypostasized as substantial bearer and proximate actuation of the same "force" or "active power," and attributed to it a purely psychic nature; though, in fact, nothing like force or acting power can at all be detected as belonging to the psychic phenomena of actual awareness. These are all we directly know of psychical existence, and they are all obviously forceless and evanescent. Even if "force" could possibly constitute a substance or entity remaining identical while spending itself in producing appearances and their changes; even then it would, in order substantially to exist, be of a nature differing altogether from what we know as psychical. Leibnitz, by conceiving "force" as a psychical substance, assumed in fact as the world-producing and world-actuating agent an utterly forceless fiction. The world of psychic phenomena which, for him, constitutes the only really existing world, is here virtually supposed to arise out of nothing through purely psychical means. But in no natural way can the evolving consciousness of such simple substances, or units of individuated force, as his monads are held to

be, arise fatalistically out of an innate endowment of the particle of psychic force of which they are said wholly to consist. An ideal phenomena-producing agent must either have some raw-material to work upon, as the formless $\psi\lambda\eta$ of Plato, or it must create its phenomena out of nothing, as Fichte pretended to do, and as Leibnitz virtually did, although he conceived his monads as supernaturally endowed with a potential world-creating consciousness.

Neither substantiality, necessarily inferred as underlying natural phenomena, nor causation as effecting their changes, are in the least accounted for by these eminent thinkers.

Hume, who called the "idea of substance" an "unintelligible chimera" denying also causative efficiency in nature, and who believed, therefore, his system to be pure Nonsubstantialism and forceless phenomenalism, had, notwithstanding, to presuppose somewhere in latency an enduring memory as substantial bearer and issuing matrix of the "ideas" that faintly remember vivid "impressions," assuming therewith some sort of efficient bond between them; and this despite his having positively declared all "impressions" and therewith all their dependent "ideas" to be mere "internal and perishing existences." Fichte who, unrecognized by himself, freely operated with his own latent store of gathered experience as arising within his conscious content, believing it to be a spontaneous, world-creating activity, conceived, nevertheless, a substantial Ego, as the enduring bearer of the activity that freely posits and wholly creates all existence.

Without substantiality and efficiency no world construction will hold together. But these solidifying principles are not to be reached by detaching from the

flowing conscious content of our moment of actual awareness one or the other of its distinguishable psychic phenomena, such as sensation, thought, volition, affection, and hypostasize it conceptually generalized and substantialized, as effective and permanent psychic power or faculty. Nature is not made of such fictitious, ephemeral stuff. Indeed, it cannot be too often and too emphatically insisted upon, that without inferring a non-psychical, extra-conscious, substantial matrix, whence the conscious content issues into awareness in significant and coherent order, there remains in existence nothing but a complex of perishing, meaningless, conscious phenomena, unsupported, unperceived, and understood by any enduring subject.

The conception of substantial permanence amid change is necessitated by the fact that all conscious phenomena form part of the transient content of ever-lapsing time, and are therefore themselves wholly unsubstantial and evanescent. A steadfast substantial entity is, moreover, necessitated as the enduring subject, who not only manifests the conscious content, but is himself apprehending, remembering, cognizing, and recognizing its multifold import. Such a subject has been epistemologically and scientifically demonstrated to consist of what is perceptually revealed as our living organism. Besides being intuitively held by all rational beings to be at least the bearer and manifesting agent of the conscious content it carries along with it, it alone in our world is identically reintegrated while spending itself in multifold activities, without which nothing steadfastly abiding, nothing identically conceived, could exist in the nature we are conscious of. Our organic being, itself through and through in constant flux, and yet capable of maintain-

ing its essential identity amid all change, proves to be the real subject that harbors as its own possession the matrix of the all-revealing conscious content, and that consciously feels, perceives, thinks, experiences the emotions and wills the actions, in which his mental life consists. Having thus arrived at a scientifically demonstrable conclusion regarding the only real substantial entity and agency in nature as consciously revealed, the second principal problem of philosophy and science, that, namely, of "causation," still awaits satisfactory solution.

How far is the bond of efficient causation we consciously apprehend as obtaining between natural phenomena; how far is it organically or otherwise knit within the apprehending subject; and how far does it, independently of such subjective origin and conscious apprehension, obtain directly between the occurrences of the so-called physical, non-psychical, extra-conscious world?

In giving expression to the problem of causation in this form it becomes obvious what tangled question it really is, involving all the difficulties encountered in idealistic and in materialistic interpretations of nature. Its idealistic conception led Hume, a genuine experientialist, to ignore altogether causal efficiency as obtaining in any sphere outside consciousness, and to reduce the seemingly necessary connection between natural phenomena to habitual experience of their sequence as they arise within consciousness. Kant, ignoring, likewise, causal efficiency outside the conscious individual, attributed it to a synthetical power inherent in his conceptual category of causality. By materialists, on the contrary, true causation is regarded as directly and necessarily obtaining between the phe-

nomena of physical nature, irrespective of their conscious apprehension, and regardless of any causative intervention within the organic being of the physical observer.

It would be a great mistake to believe that the true nature of causation had been disclosed either on the idealistic side or on the materialistic side. Necessary sequence of organic activities accompanied by conscious phenomena; necessary sequence of perceptual sense-stimulated phenomena, and necessary sequence of extra-conscious physical occurrences consciously signalized, these are modes of causation so interwoven, so complex, and so obscure in their origin that the prospect of an adequate understanding of the causative processes underlying such necessary sequence has hardly yet come in sight.

Previous to the experiential mode of interpretation, thinkers finding in the course of their reasoning ready-made and systematized concepts at their disposal, which independent of actual perceptual awareness seemed to comprise as their own content all particulars of knowledge, very generally believed that knowledge is really attained by a ratiocinative process that discloses all we can possibly know as involved consequents or particulars logically flowing from conceptual premises. Efficient causation was either completely overlooked or identified with logical "reason." "*Ratio seu causa*" became a potent formula wherewith to conjure up from their latent dwelling-place into conscious awareness the phenomena of actual experience. Logical deduction was until recently the only acknowledged canon of truth. Not before the primary and grounding import of perceptual awareness became definitely recognized, principally through the influence

of Locke, who adopted the experiential method recently employed in natural science; not before then was the spell of undisturbed ascendancy so long enjoyed by conceptual reasoning seriously broken. The unheeded Aristotelian dictum, "*nihil est in intellectu, quod non fuerit in sensu,*" began now to be consistently used in guiding the interpretation of the conscious content. English Experientialism, instead of expecting the influx of knowledge to accrue intuitionally from innate depths of our being, searched for it at the sensorial pole. Sensationalist explanations won growing numbers of adherents and scandalized philosophizing theologians and conceptualist philosophers, who were dreaming their dogmatic dreams and indulging their unhampered fancy on the high *a priori* road. Sensationalism, however, soon grew overbold, and maintained again with Protagoras, that everything in nature is actually made up of nothing but sensations; an opinion, by the by, toward which a number of our present scientists are inclining, having adopted sensorial Idealism as their creed.

Hume, though himself a radical experientialist, recognized the nihilistic consequences to which such pure Sensationalism necessarily leads. For if everything in nature really consists of a complex of sensations, which are "perishing existencies" accruing at random, how can they of their own accord come to constitute definite enduring entities, that stand in definite relations to one another as actually experienced? Even the fictitious substantializing of separate sensations or perceptions as the enduring material of nature failed to account for the definite and orderly connections of its phenomena as actually experienced. The orderly composition and concatenation of sensations or "impres-

sions" found established in experience, despite their evanescence and their disconnected random accrual in direct awareness, had evidently to be accounted for. Hume, as all students of philosophy know, sought to solve this profound and essential problem, involving that of causation, by assuming that the habitual frequency of experienced succession among definite impressions establishes eventually a seemingly causative link between them, so that a given antecedent impression will always be followed in consciousness by its habitual consequent as "idea." The vivid impression of fire, for instance, is thus always followed in consciousness by the faint idea of heat, which as a vivid impression had always been experienced as immediately arising after it. In Hume's view, what is called "causation" consists then, as he himself states, in "an idea related to or associated with a present impression."

It is clear that this attempt at solving the problem of causation fails altogether to deal with the real bond of necessary, forceful connection in nature. In Hume's forceless habitual connection between definite vivid impressions and definite faint ideas there is obviously no real causation involved, not even in invariable sequence, but only a highly probable association between definite vivid percepts and definite ideas aroused in consequence from latent memory. Association, and not causation, is the outcome of Hume's teaching concerning the link by which separate units of experience are welded together.

It is true that what is actually perceived as fire -- whose extra-conscious existence is, however, not admitted by Hume -- is as vivid impression always and necessarily connected in real nature with what may be actually felt as heat. But this same vivid impression

of "fire" is obviously not necessarily and infallibly followed in consciousness by the "idea" of heat. One may quite well perceive fire without the idea of heat arising in consciousness. But one cannot actually perceive fire without on approaching it being actually and forcibly made to feel as vivid impression the heat invariably found to be connected with it. Considering true causation in nature, the real question is evidently—expressed in Hume's terminology—how the fire as a vivid impression happens to be invariably connected with heat, as likewise a vivid impression, and not merely with heat as a faintly remembered idea. Of such real connection in nature Hume took advertently no notice. Captivated by Berkeley's nominalistic Idealism, he sought to explain what is revealed in the conscious content as consisting of a more or less closely coherent collocation of conscious particulars; openly ignoring all extra-conscious implications, while tacitly making use of substantiality in the form of an identically enduring matrix of remembered experience, and of causative efficiency as an organically effective link between actual and remembered occurrences. His professed Non-substantialism turns out to be based on genuine substantiality, and his professed inefficaciousness on effective organization. Facts of vital organization underlie all problems arising in the attempt to interpret the all-revealing conscious content. Whence and by what influences do the vivid impressions, and their experienced connections, come to emerge into conscious awareness? This question of questions is left by Hume wholly untouched.

Nevertheless, Hume assisted most effectively in revolutionizing the way of philosophically interpreting natural phenomena. He supplanted mere logical

deduction from ready-made premises, believed hitherto to be the primordial source of knowledge, by recognizing on the contrary, and by causing to be recognized by leading thinkers, the real priority and import of sensorial experience as the indispensably given material of true knowledge. He showed that without actual sensorial experience no genuine system of knowledge can be established, that actual vivid sensorial experience, inner and outer, has first to be gathered, before remembered representative ideas can possibly arise in consciousness. The vast and grave import of this experiential interpretation, as radically opposed to mere logical deduction, was clearly recognized by the scientifically disposed and keenly penetrative thought of Kant. Having been philosophically trained in pure conceptual ratiocination, believing the method of attaining knowledge to consist in the right use of the principles of formal logic, he was roused to the depths of his truth-seeking nature by becoming through Hume's influence convinced that all material upon which real knowledge is founded enters the mind exclusively through direct sensorial experience, and that, without such experience having accrued, no valid instructive knowledge can be derived by means of mere logical deduction. "Synthetical propositions" are the indispensable foundation of all "analytical propositions." All systems not founded on sense-given experience, all previous metaphysics, therefore, can be but visionary and invalid.

After this awakening from his "dogmatic slumber" Kant came almost entirely to agree with Hume's radical Experientialism, though unaware of its purely idealistic character. On contemplating, however, the seemingly insoluble problem of harmonizing the world

of sense with the world of thought, the "*mundus sensibilis*" with the "*mundus intelligibilis*," he was led to share for a while the theistic Mysticism of Malebranche. Finally, he entered upon his critical period by recognizing that space and time are forms of our own subjective intuition, wherein all sensorial affections enter and are received; space being the form of our outer sense, time that of our inner sense. This view of the subjective inwardness of time and space-perception led soon to the discovery of what seemed to him of paramount importance; namely, that mathematical constructions and operations within this subjective space and time yield *a priori* synthetical propositions; that it is possible, therefore, irrespective of all *a posteriori* sensorial experience to gain instructive *a priori* knowledge. Mathematical constructions and propositions are consequently results of a synthetical process *a priori*, not of *a posteriori* sensorial experience. This view seemed to explain the strange and signal certainty and universally binding validity of mathematical propositions.

On the strength of this discovery Kant concluded that our psychical being is in possession of a combining and constructing *a priori* faculty, and that all synthetical operations in conscious experience are the exclusive work of this faculty. The task now offered for solution was to detect how the experiential sensorial material which comes to fill empty space and time, how this fractionally and randomly accruing material is influenced by the *a priori* combining and constructing faculty. He found in conceptual cognition the sensorial raw-material of knowledge systematically combined in definite ways, while in direct experience it is received in unsynthesized and unsystematized confusion. Con-

sequently, so he argued, it must be the discovered *a priori* faculty that synthetizes and systematizes the random material of sense, constructing thereby the universally valid knowledge found in conceptual cognition.

Kant declared the faculty of understanding (*Verstand*) to be this agent that combines the loose material of sense into rationally consolidated order. In this view all rationally valid connection between sensorially experienced phenomena, the causative connection included, is brought about exclusively by this *a priori* faculty of our psychical being. Nature, being a system of connected experience, is therefore itself constructed or "made," as Kant expresses it, by the *a priori* faculty of "understanding." It evidently follows, that all valid and lasting connections, and all systematic order obtaining among natural appearances, are therewith established by agencies that have their seat within the exclusive compass of our individual mental being. Kant, like all former thinkers, becomes thus inextricably caught in the magic circle of pure idealistic Solipsism, from which there is no legitimate escape, save in the recognition of the substantial, extra-conscious, power-endowed existence of that which is perceptually revealed as our living organism. Kant, it is true, recognized a world of extra-conscious things-in-themselves, and attributed to this inferred realm of transphenomenal subsistence power to affect in definite ways our sensibilities, causing thereby definite sense-material to arise within subjective time and space. But although real forcible causation is here implied, Kant, like Hume, refrained from trying to explain how such causation by force of incommensurable, foreign, extra-conscious agencies can here take place; how an extra-conscious

thing-in-itself can give rise in another being to a definite conscious state.

In opening this momentous question of causation in the introductory section, it was pointed out how Kant's profound and laborious attempt to discover the means by which nature and all its phenomenal appearances comes to be rationally constructed and conceived as a consistently systematized and unified body of knowledge; how this keenly penetrative critical attempt failed, nevertheless, to throw any true light on the real problem of causation. Indeed, though intended exhaustively to probe it, it hardly touched at all upon its real nature. It merely sought to show how our apprehension of experientially received sensorial material, and its final systematized unification in conceptual apperception is brought about; not how a definite occurrence taking place in the ordered concatenation of the real existents that constitute nature is caused by a definite antecedent occurrence which necessarily draws with it as its effect a succeeding definite occurrence.

Kant rightly recognizes that the sequence of flowing appearances in time must be the outcome of a permanent, force-endowed agent or substance. He says, as already quoted, "where there is action, and consequently activity and force, there is also substance; and in it alone is to be sought the seat of the fruitful source of the appearances." Nothing could be more truly said and said to the point in this connection. The flow of the phenomenal appearances, which constitute the conscious content, must indeed issue from some force-endowed, substantial matrix. But where is this substantial seat of the fruitful source of conscious phenomena to be found? Kant rightly recognizes that the two contradictory determinations of permanency and

change, "entgegengesetzte Bestimmungen," as he himself calls them, have to be attributed to "substance." Now there is, as has been shown, only one existent in our world which is endowed with these contradictory attributes, and this is what has been here demonstrated to be the force-endowed, extra-conscious, ever active entity, which compels as a conscious revelation of itself what is perceived as the living organism. As a genuine substance, containing the issuing matrix of the conscious content, and, indeed, as actuating all vital functions, the living organism has preëminently to be considered a causative agent. This state of things is pregnant with consequences that cannot be reconciled either with idealistic views, or with the purely mechanical interpretation in which motion alone is a causative agent. The living being by force of its substantiality and its specific organization is a causative agent of a wholly hypermechanical kind. This weighty truth shall be presently further elucidated.

Kant, ignoring altogether the important part the organism is playing in causation as a substantial agent, identifies the phenomena-issuing substance with the matter of natural science, whose "quantity neither increases nor diminishes." But with him this "matter" is not really the resistant, inert substance of materialistic science, subsisting imperishably outside consciousness. It is "*substantia phenomenon*," something belonging to the phenomenal order, though conceived, nevertheless, as force-endowed and causative. This conception obviously involves a whole cluster of contradictions. To begin with, Kant's "matter" has no remotest resemblance to the matter of natural science, whose quantity has been experimentally shown neither to increase nor to decrease. Instead of being inert,

Kant's material substance is preëminently active, for he declares it to be the fruitful source of all phenomena. But, it must be asked, how can something belonging itself to the phenomenal order be a force-endowed substance, and the veritable cause of the whole phenomenal world of which it forms part? And how can anything belonging to the phenomenal order be conceived as neither increasing nor diminishing in quantity? Here Kant's thought became inextricably confused. He evidently seized upon the compelled percepts, which are generally taken to be material existents, bodies, or things, and declares their intimate consistency to be "*substantia phenomenon*," vaguely identifying it with the matter of natural science. As counterpart of the phenomenal world, he had the noumenal world in mind, and with it his dynamical theory of matter, in which dynamical forces are the real acting agents, that give rise to the material substance, which is here held to be the seat of the fruitful source of all appearances. If so, nature would not be made by the understanding as insisted upon in the "analytical logic," but would be the outcome of the phenomenal matter of the category of substantiality, whose "quantity neither decreases nor diminishes," though it is the "seat of the fruitful source of all appearances."

Under such a state of things, where all natural phenomena are caused by the activity of a definite substantial entity, there would evidently be no need for other causative agencies. But Kant, in order to accomplish the transformation of sensorial confusion and passivity into actively synthetized and apprehended order and unity, requires other causative agencies besides mere "*substantia phenomenon*." Leaving out of account the things-in-themselves, that are conceived as the active

agents which cause space and time to be filled with definite sensorial material; leaving out of account also the agencies which cause the appearances to arise in certain empirical order in time and space, without which the objectifying categories would — as Kant himself positively states — be impotent to exercise their *a priori* function in relation to them; leaving all these interceding causative influences out of reckoning, there remains still the specific category of causation, which Kant makes to account for the necessary connection of successive phenomena, and therewith for all genuine, objectively valid causative changes in nature. Under this causative view it is after all not really the *substantia phenomenon* which is the true causative agent, but the *a priori* function of causative synthesis within the cognitive unity of apperception. For it alone finally determines what phenomena are necessarily connected as cause and effect.

Consequently, despite empirical apprehension and sensorially given material, it is with Kant in a realm of *a priori* cognitive apperception that the all-comprising, universally valid synthetical unity of thought and being in reality subsists. No wonder, then, that his “transcendental” idealism was at once converted into a “transcendent identity-philosophy” by his immediate followers, and again by the Neo-Kantians of the present time.

In contemplating Kant's attempt to solve the problem of causation one may, enlightened by his profound penetration of its manifold complications, gain a glimpse of what philosophical and scientific interpretation have still to accomplish before an adequate solution is attained. It will be well, therefore, more explicitly to point out these perplexing complexities.

Kant recognizes that causation applies only to changes as they consecutively occur in time. An antecedent occurrence dwindles away by being seemingly changed into a different succeeding occurrence. As soon as the succeeding occurrence has completely emerged into actual appearance, the antecedent occurrence has completely ceased to exist. This flow of succeeding changes Kant rightly concludes cannot arise out of nothing. It presupposes an extra-conscious, force-endowed substance, which emits the changeful, perishing occurrences as modes of its activity, while enduring itself unchanged or identical. "Bei allem Wechsel der Erscheinungen beharret die Substanz." The question now arises, how the succession of nothing but evanescent occurrences comes, nevertheless, to be collectively apprehended and enduringly gathered into an orderly system of objectively valid knowledge? This is Kant's way of looking upon causation and necessary synthesis in general.

The succession of changes flows by, from moment to moment, without leaving behind, as such, the least trace of their existence. This being the case, they have evidently to be collectively apprehended and their apprehension retained by an active and remembering faculty. This apprehending faculty, which with the help of "reproductive imagination" gathers together into simultaneous awareness the experienced phenomenal changes, exercises its function, however, likewise in consecutive moments of time. It can therefore survey the stored-up content of reproductive imagination only by consecutively passing from one part of it to another. In this apprehending survey there is obviously no binding order. In surveying a "house," for instance, the survey may begin anywhere and end

anywhere. Consequently, the further question arises, how it comes to pass that, nevertheless, definite antecedent occurrences are conceived as being necessarily followed by definite succeeding occurrences, that a definite cause is invariably connected with a definite effect.

All this happening is believed by Kant to be taking place in individual or subjective consciousness. Where then does the objective necessity in the sequence of occurrences come from. It is obvious that an antecedent moment of time loses itself entirely in the succeeding moment, which is thereby wholly determined by it. Consequently, the appearances it carries with it as its content wholly determine the changed appearances of the next moment. But time itself cannot be apprehended, only its freight of succeeding appearances is the object of apprehension. These appearances supplant each other successively. And their definite sequence in time must, then, evidently be necessitated by the definite activity of the underlying substance which issues them into actual awareness. They therefore necessarily appear in definite order in subjective or empirical apprehension, because they are thus definitely determined in the realm of substantial existence. A "ship," for instance, is apprehended in an antecedent moment higher up the stream than in a succeeding moment. This order is binding and cannot be rationally reversed. But to be, moreover, recognized as conceptually established, or objectively and universally binding, it must, according to Kant, be ranged in this necessary order within the all-comprehensive synthetical unity of apperception. And in Kant's words, "the concept which carries with it the necessity of synthetical unity can only be a pure con-

cept of the understanding, such as is not contained in our (empirical) apprehension. It is here the concept of the relation of cause and effect, of which the former determines the latter in time as actual consequent, and not as something which merely precedes in imagination."

As already stated, by assuming that "the necessity of synthetic unity" dwells in an "*a priori* concept of the understanding," and therefore in a realm of psychological efficiency transcending empirical experience, and underlying it; by arriving at this conclusion Kant's system, despite all his protestations to the contrary, becomes consistently a system of pure conceptual idealism. And with it the question of causation is transferred to inaccessible regions.

Notwithstanding his manifold elaborate means of explaining causation, Kant feels that by conceiving all his complex machinery to be immanent in the conscious individual and operative only in the phenomenal world, he has not yet reached the real fundamental causative substance, either in his "*substantia phenomenon*" or in his category of causality. Finding himself a prisoner in the magic circle of pure Solipsism, everything within this mere subjective sphere is and can be only of phenomenal import, possessing in itself no enduring, force-endowed substantiality, and no objective or universal validity. His synthetic categories have closely examined no actuating power of their own. It is from the "synthetical unity of apperception" that in the system of "transcendental idealism" all actuation really irradiates. And this unity of apperception, where all knowledge is found systematically comprehended and unified, belongs in Kant's view, not to the phenomenal world, but to pure universal reason, which

is conceived as having its seat in a super-phenomenal, "intelligible" world. Of this intelligible world our own real, essential being or "intelligible Ego" is said to form part. And it is from this higher noumenal region that the entire machinery of Kant's phenomenal world is set going, on the sensorial side by the noumenal things-in-themselves, and on the conceptual side by synthetical unity of apperception of the "Bewusstsein überhaupt." In Kant's "Practical Reason" the intelligible Ego is explicitly declared to be endowed with free causative power capable of initiating definite modes of actuation manifest in the phenomenal world.

In presence of the one actually and positively given fact; namely, the flow and evanescence of all conscious phenomena as appearances in time, Kant did not hesitate to conclude that they must flow from a substantial, force-endowed, identically abiding source. He grounded this inference on the axiom so frequently resorted to by ancient philosophers, and from whose potent authority the physicists of the present day derive the supreme and eminently serviceable principle of their science, the principle of the "Conservation of Energy." Kant adopts it, as he himself says, from the "ancients" under the form, "*Gigni de nihilo nihil, in nihilum nihil posse reverti.*"

It being certain that we are actually aware of nothing but our own conscious content, this conscious content with all its changeful appearances cannot arise out of nothing, cannot be self-caused. Consequently, so Kant rightly argues, there must exist an underlying actuating substance which causes these conscious appearances to emerge into actual awareness. So far no difficulty is apparent. But it is an evident fact that the entire conscious content, being a content of time

wherever it may come from, does actually revert into nothing. It is clear, then, that the second part of the grounding axiom, "*in nihilum nil posse reverti*," proves to be nowise applicable to conscious phenomena. These flow continuously out of existence, and must, therefore, be as continuously renewed from "the seat of the fruitful source of all appearances," which must have its existence in a realm of extra-conscious subsistence.

Right here the ever-perplexing knot of philosophical and scientific interpretation has to be untied, and the tangled skein of intra-conscious and extra-conscious existence; of forceless, evanescent appearances, and force-endowed, enduring entities, intelligibly unraveled, before this strangely complex state of intermingling disparate things can be correctly understood. First of all it is of utmost importance to recognize that the grounding axiom cannot either way be applied to a world of purely ideal consistency, for psychical phenomena are all transient appearances, and can therefore not arise out of anything known as psychical. The source of the flow of psychical phenomena must be obviously extra-conscious, and therewith non-psychical. The forceless, perishing conscious phenomena of an antecedent moment cannot themselves in any way cause the existence and appearance of the phenomena of the succeeding moment. Consequently, the phenomena of the antecedent, as well as those of the succeeding moments of time, have necessarily to be conceived as being caused to arise, and this in whatever order they appear, by force of a continual activity of an underlying non-psychical substantial entity, which remains itself identical or unspent amid the flow of conscious appearances and their changes ema-

nating from it. As repeatedly stated, in vain has philosophy searched for such a substantial entity from its earliest beginnings up to the present time. For no existent was recognized in nature or anywhere within ken of human awareness and cognition that could be logically conceived as remaining itself identical while undergoing and manifesting changes. And yet such an existent was necessitated in order to account for the phenomena of the all-revealing conscious content.

This perennial dilemma of identity amid change, logically incomprehensible, is positively found overcome in nature by the demonstrable fact, that what is perceptually revealed as the organism is the very substance sought for by philosophy; a substance, namely, which remains itself essentially identical, while being "the seat of the fruitful source of all appearances." There is no other such substance in our world. Intuitively it has long been recognized as the bearer of the conscious content. But how this could possibly be the case has remained philosophically and scientifically unintelligible. Hence multifold philosophical systems, all virtually bent on accounting for the origin and significance of what is revealed in the conscious content, this being the only source of actual awareness and direct information.

The problem of causation, inextricably connected with extra-conscious as well as intra-conscious existence, can evidently be solved neither by the method of Hume, nor by that of Kant, nor by looking in any way for the bond of causative connection as being established and obtaining between the conscious phenomena themselves. Conscious phenomena — and all phenomena actually and directly known are conscious phenomena — issue from their extra-conscious matrix

into actual awareness in preëstablished order and combination. Percepts are often considered to be formed by a definite combination of specific sensations; if so, then, this combination must have been effected organically in the extra-conscious matrix, whence the established product issues ready-made into actual awareness. On mere momentary sensorial incitement percepts, implicitly signifying a wide range of former experience, start from their all-comprising matrix into instant awareness. If, moreover, a definite phenomenon or conscious state is invariably or generally followed by another definite phenomenon or conscious state, then again this so-called causative connection, or this actual association, must have been preëstablished in the extra-conscious matrix, as the entire complex phenomenon issues thus connectedly ordered into actual awareness.

The problem of efficient causation is nowise directly involved in the ordered procession of phenomena or conscious states themselves, as they appear in actual awareness. It comes to the front when the cognitive import and objective validity, together with the definitely established order of perceptual and other psychic phenomena, are recognized as the essential questions to be answered.

To pure Idealism, dealing with nothing but psychical or consciously known states, the problem of causation does not really exist. The quasi-causal order of Hume's vivid impressions and their faintly remembered ideas is brought about by means of surreptitiously assumed extra-conscious agencies. For habitual sequence presupposes reproductive memory having its seat in an extra-conscious matrix, wherein the order to be reproduced has become organically established and through whose agency the ordered phenomena

issue as such into actual awareness. As to conceptual Idealism, which reaches its culmination in Panlogism, it has to assume the complete preëstablished order of all phenomena in their totality as content of a preëxisting, all-comprehending Absolute; and to assume, moreover, the efficient phenomena-producing agency of the substantialized concepts entering into the all-inclusive logical system. This conceptual air-castle is built with no other material than the philosopher's own idealized conscious experience, consisting as such of nothing but forceless, ephemeral conscious states. Who wishes to become fully convinced of the truth of this assertion need only look into the arbitrary and wildly fantastic conceptual constructions of the "Young-Hegelians," and indeed of those of the master himself. Our individual experience received in preëstablished racial molds, and gathered from nature and social intercourse, guided thereby by traditional ways of wholly inadequate interpretation, becomes, indeed, more or less logically systematized within us racially developed and socially thinking beings, so as to form a somewhat consistent body of knowledge due to progressive culture, and practically serviceable for the time being. But it is surely a scholastic delusion of conceptually trained thinkers to believe that their conceptual systems are in the remotest degree expressive of absolute truth, or merely of truth as alone attainable, gradually, by close investigation of natural phenomena.

To reach the sphere of efficient causation the given psychic phenomena of the conscious content have to be transcended by recognizing their extra-conscious implications and significations. Kant distinctly felt that in accounting for true causation subjective experience had to be transcended. But he had no sound

epistemology to offer, justifying escape from the charmed circle of Solipsism, in which his critical thought became wholly entrapped. He had cut off all revealing communication with the perceptible universe, enclosing himself in a thought-woven cocoon of intricate texture, from which he believed he could ultimately emerge, as the transfigured, spaceless, timeless "intelligible Ego," which he all along held to be his veritable being. Bent on solving the epistemological problem, with its causative implication, Kant actually eliminated it from his system of critical Idealism. By declaring the imperceptibility of the perceptible world, which trans-sensorial, trans-phenomenal world he held to consist of unperceived and wholly unknowable things-in-themselves, whose characteristics are nowise revealed in the vivid, minutely figured percepts, which they arouse in sensorial awareness; by dint of this fundamental misconception he was thrown back entirely into the sphere of pure subjective Solipsism. The relation of cognition to an extra-conscious perceptible world being thus denied, no other task seemed to remain but to find out how his passively received sensorial material, which falls somehow already formed and specifically constituted into empty space and time; how it is then cognitively apprehended, and its experienced order rendered objectively valid.

Now, as the conscious content, which contains all we are at all aware of, issues ready-made from its extra-conscious matrix, it is clear that whatever synthetical and cognitive elaboration sense-stimulated material has received must necessarily have been imparted to it within the extra-conscious matrix, from which the synthetically and cognitively elaborated product issues full-fashioned into awareness. This fashioning and

sustaining extra-conscious matrix has been here epistemologically demonstrated to form part of what is perceptually revealed as the living organism. And the consciousness which it potentially harbors has been organically elaborated in ceaseless phyletic interaction with the outside world, and has significance only for the life of its actual bearer. Consequently, what Kant believed to be accomplished by his imposing array of psychical faculties is in reality accomplished by the creative activity of vital organization, through whose agency has been phyletically or productively developed the human race with all its innate endowments, and through which human individuals embodying these racial endowments, psychical as well as physical, are reproductively developed from generation to generation. Kant's problem is therefore fundamentally one of vital organization and not of mental *a priori* faculties. Synthetical elaboration is not due to efficient agencies attaching to anything forming part of the conscious content, not to anything of psychical consistency, but to the all-efficient vital travail underlying it.

In an examination of Kant's "Critique" the present writer came to the conclusion, as long as thirty-five years ago, that "necessary connection of the sensorial manifold is due to a physiological, not to a logical activity."¹ And after having devoted many more years to the investigation of vital phenomena, he became all the more confirmed that here the question is not, "How are synthetical judgments *a priori* possible?" The question is, "How are synthetical sensations and volitions organically possible?"² To enter into an explanation

¹ "Die Kant'sche Erkenntnisslehre widerlegt," etc., 1871, p. 141.

² "The Dependence of Quality on Specific Energy," "Mind,"

of true causation, the right to do so has to be gained by an epistemology that justifies the intuitional belief in the real existence of an external world as vividly revealed in perceptual awareness. Only then are we in a position to recognize the astounding complexity of the genuine problem of efficient causation; efficient causation as operative in organic and in inorganic nature, and in their many modes of interaction.

How does it happen that percepts arising full fashioned from their matrix within the apprehending subject reveal the presence and characteristics of existents subsisting independently of being perceived, and which compel the revealing percepts to arise within consciousness by mere dynamical modes of stimulation, mostly through the instrumentality of intervening agencies? How does it happen that the definite determinations of our subjective time and space-awareness congruently coincide with those of objective time and space; an all-important fact evinced by their congruent corroboration by all percipients of the same kind; a fact which insures the objective and universal validity of space and time-determinations, and therewith the possibility of an exact physical science. And by what means are these causative relations, as consciously apprehended, organically incorporated in the living being? These are essential questions involved in real efficient causation. And it is obvious that they can be answered only by taking facts of productive and reproductive vital organization into account.¹

¹ See "Causation and its Organic Conditions," "Mind," 1882.

IV. SUBSTANTIALITY AND CAUSATION IN PHYSICAL SCIENCE

PHYSICS, taken as the science of what perceptually appears, encounters in its search after genuine substantiality and causation all the perplexities brought to light by philosophical exploration. And although it makes sundry attempts to discover that which in the fleeting panorama of changeful appearances is substantially enduring, and to ascertain how physical occurrences come to be causatively connected, it has hitherto utterly failed, and finds itself reduced to pure visual Phenomenalism. For, undeniably, its immediate object of investigation is a mere visual phenomenon arising in individual consciousness. This being so, it is instructive to examine how such nature-depleting solipsistic outcome of exact science is brought about. It will be found to be mainly due to a deficient theory of knowledge.

Physics makes, to begin with, short work with the perennial perplexities attaching to the search after genuine substantiality and causation. And it must be admitted, that this short cut towards scientific interpretation has proved to be of great advantage to physics, when the aim is simply to measure interdependent states and changes obtaining among the objects with which it is concerned. These objects are seen to occupy definite relative positions in space, and to move interdependently in definite directions with greater and smaller velocity, traversing spatial distances in more

or less time; also to undergo changes in their configuration, and to suffer commotion or agitation of their constituent elements. The investigation of these sundry modes of space occupancy and of motion, their exact measurement, and the recognition of the invariable regularities thereby followed, are the facts and operations considered to constitute physical science.

One of the most familiar and seemingly most simple experience in the physical world is the mass-motion of bodies. The general ways and laws according to which it takes place are ascertained by the special science of theoretical mechanics, which science is held to form the groundwork upon which the interpretation of the more complex physical phenomena has to be based. And here it is the theory of atomic mechanics that for the last two centuries, until quite lately, has principally done service in the explanation of physical phenomena, and which up to the present time has been essentially relied upon. This eminently helpful theory operates with two entirely disparate entities: matter and motion; both considered as substantial, indestructible entities. To their presence and interaction everything in physical nature is then taken to owe its existence. Bodies inorganic and organic are thus held to consist of inert, unchangeable material elements, which are made to aggregate into definite configurations, and to be otherwise actuated by modes of motion.

In the physical world nothing is visibly perceived but bodily forms at rest or in motion and commotion accompanied by more or less changing configurations and qualitative distinctions. Under this view, bodies consisting of aggregates of inert material atoms are considered mere passive vehicles actuated by motion, which is declared to be the one exclusive agent that

forcibly causes all changes manifest in the physical world. It is clear that motion, in order to move inert bodily masses, has to be conceived as a force-endowed entity. It is therefore "motion" as moving force that plays the actuating part in atomic mechanics. Motion, however, is something eminently visible, while force is something wholly invisible. Now if motion is really identical with the force that moves inert masses, how can it be something visible? It becomes, indeed, quite unintelligible how motion, conceived as a separately existing and therewith invisible entity, actuating *ab extra* ponderable masses, can possibly be the same thing as the visible motion we are familiar with. The truth is, we know motion only inseparably conjoined with moving masses, and the resulting forcible effects are always the work of moving masses, and never of motion alone. Motion, apparently an eminently visible phenomenon, is obviously visible only as moving masses or moving elements of masses. Yet materialistic physicists declare it to be a separate, indestructible, force-endowed entity: transferable from one mass to another, or distributable among many masses, without suffering diminution or augmentation of its quantity. Conceived as detachable from mass, and imagined as independently existing, what is here called "motion" is evidently a merely inferred something, of which we have no direct sensible experience. And it is really to this merely inferred something, and not to what is visible as motion, that atomic mechanics attributes the force or power to actuate inert masses. The motion we actually perceive, and which as such is inseparable from the mass to which it is attached, has here to be consistently looked upon as being itself only a visible effect of what is inferentially conceived as an

imponderable force or agent, capable not only of imparting motion to masses, but capable also of producing all perceptible changes in and among masses.

When the forcible physical effects are believed by physicists to be the work of an efficient immaterial agent, capable of assuming different qualitative guises in passing from one inert mass into another, then this motion and change-effecting agent becomes what under the name of "energy" is playing a most important and fruitful part in physical science. But here a serious discrepancy comes to light as irreconcilably obtaining between atomic mechanics and energetics. For that which moves and actuates the inert masses of atomic mechanics is necessarily always energy of an active or kinetic kind. When the inert masses, or their inert constituent elements, are not actually moved or energized, they must be, of course, wholly devoid of energy, and can therefore nowise be, nevertheless, bearers of latent or potential energy, as assumed in energetics. In the world of atomic mechanics there can exist only kinetic energy. There is no resting place in it for latent or potential energy. Yet, without the assumption of such energy, energetics is impotent to make sense out of given phenomena. There must evidently be something essentially wrong, either with atomic mechanics or with energetics, or with both these theories or modes of interpretation, when they are offered as valid explanations of the given facts, and not merely as convenient conceptual devices for facilitating the grasp of uniformities and interdependencies in the perplexing entanglement of changeful phenomena.

"Energy" is virtually declared by physicists to be an all-efficient indestructible entity, appearing under manifold qualitative guises, and capable of performing

every kind of work in nature, without ever spending itself in so doing. For its quantity is said to remain measurably undiminished, despite all the work it performs and all the transformations it undergoes. Surely nothing can be more strangely wonderful than this inexhaustible all-efficiency of one and the same amount of energy. In contemplating this widely accepted scientific doctrine a strong suspicion arises that physics has landed us here unawares amid the magic doings of fairyland, where nothing is impossible. That there is some serious fallacy involved in the current conception of energy seems highly probable to mere logical intuition. Otherwise energetics, instead of demonstrating the impossibility of perpetual motion, would itself introduce into nature the most stupendous work-performing *perpetuum mobile* imaginable. For, after accomplishing all the work in the world, its work-performing capacity would still remain an undiminished quantity. It is rightly insisted upon in physics, no less than in mathematics, as a fundamental axiom, that a quantity which is spent in an operation cannot be rationally conceived as, nevertheless, enduring in undiminished efficacy. Yet this is exactly what is believed to be the case with energy. It is either held to be transformed undiminished into the changes to which it gives rise; or masses that have spent their kinetic energy in performing work are declared, nevertheless, to retain the same amount of energy in a latent or potential state, ready to be respent on a future occasion. When a descended pendulum, for example, has spent its kinetic energy in re-lifting its weight against gravity, it is declared to retain, nevertheless, this spent energy undiminished as potential energy, which is then respent in its downward course, and so on, time after

time, kinetic energy being each time converted into potential energy, which is reconverted into kinetic energy.

Physical energy, like physical motion, or like any other substantially posited entity, conceived as effect-producing or work-performing agency, and declared to remain identical and unimpaired, despite ever so much expenditure of efficiency and variety of manifestations; such a conception of an all-efficient, never worn out factotum is rationally considered even more unthinkable in physics than in philosophy, where it has likewise served to explain almost everything. It is safe to say that there can exist no such substantial entity as energy is conceived to be; an entity, namely, that is spending most lavishly its quantitative efficacy and yet retaining it undiminished. Ground axiom of all reasoning has ever been, *ex nihilo nihil fit*.

The plausible reasoning employed by energetics, a reasoning which entangles physical science in a maze of misconceptions, maintains that energy as effect-producing cause is wholly transformed in undiminished amount into the effect it produces, and that this effect becomes in its turn the cause of a subsequent equivalent effect, and so on. J. R. Mayer says: "Forces are causes — *causa æquat effectum*. If the cause c has the effect e , then $c = e$; if, in its turn, e is the cause of a second effect f , we have $e = f$. This first property of all causes we call their *indestructibility*. If the given cause c has produced an effect e equal to itself, it has in that very act ceased to be, c has become e . Accordingly, since c becomes e and e becomes f , etc., we must regard these various magnitudes as different forms under which one and the same object makes its appearance. The capability of assuming various forms is the second essential property of all causes. Taking

both properties together, we may say, causes are (quantitatively) *indestructible* and (qualitatively) *convertible* objects."

The masses into which the effect-producing cause or energy is believed to slip in and out, transforming itself into the different effects it produces, are under this theory necessarily conceived to be themselves mere inert vehicles in all these amazing visible transformations on the part of an invisible agent, whose existence is only inferred from perceptible effects. Changes occurring in the position and constitution of masses are undoubtedly equivalent to that which produces them. But what is it that really produces them? Certainly nothing in the remotest degree resembling the indestructible, all-efficient entity conceived under the name of "energy."

Here physical science is in fact brought to a perplexing standstill, and only a sound epistemology can rescue it from becoming reduced to the pure solipsistic Phenomenalism already theoretically reached by the out-and-out mathematical physicists. For in actual conscious awareness—the only direct awareness we have of anything—an antecedent phenomenon is seemingly transformed into the succeeding phenomenon by wholly passing over into it. Here *c* becomes actually *e*. The former phenomenon vanishes out of existence in measure as the latter makes its appearance. This is what is immediately experienced as consciously occurring. Now, if we conclude therefrom that the antecedent phenomenon is itself the effective cause of the succeeding phenomenon, becoming thereby completely transformed into it, we thereby attribute to what is actually conscious in the present moment the power of causatively producing what will be consciously perceived in

the next moment. This, consistently carried out, would amount to a new-production from moment to moment of all that consciously appears; a view actually held by some philosophers. The content of a preceding moment of time would then be the efficient or productive cause of that of the succeeding moment, into which, under this aspect, it is seemingly transformed. By taking thus what in individual consciousness directly appears to be self-subsistent and power-endowed, exclusive psychical causation and pure solipsistic Phenomenalism are then the consistent outcomes.

When, on the other hand, as is usually done without epistemological warrant, it is taken for granted that that which consciously appears to percipient individuals has an extra-conscious material existence; and it is therefrom inferred by energetics, that the changes consciously experienced are the work of an all-efficient protean agent, which seizes upon the mere aggregates of inert atoms, coercing them *ab extra* into all the changeful appearances known as physical nature; when this at present dominant view is taken, then, undeniably, a mere fictitious, imperceptible agent is hypothetically endowed with all-efficiency, opposed in its performances only by the inertia or resistance to change of position on the part of the perceptible masses, assumed to be composed of inert particles. Such an all-efficient factotum is preëminently the "energy" of energetics, when conceived as an indestructible agent, whose various forms are interconvertible; an agent that performs all the work in nature with undiminished efficacy, and that, moreover, imparts to all material aggregates their sense-apparent, qualitative distinctions.

Neglecting for the present the profoundly essential

epistemological implications here necessarily involved, even then the theory of the conservation of energy can be shown to be a radically erroneous conception. Masses occupying definite relative positions in space may at a certain time find themselves so disposed towards one another, that tensions or stresses are existing among them, which on release become operative, giving then rise to the production of a definite amount of kinetic energy capable of performing an equivalent amount of work. A mass uplifted against the resistance of gravity, a spring bent against the resistance of elasticity, a mass expanded against the resistance of cohesion — such disequilibrated masses have in this forced position, when allowed to follow again their free bent, the power of developing kinetic energy and of performing work. But the energy once spent exists no more. It is nowise and nowhere conserved as an undiminished quantity. New equivalent external energy has to be applied in order to restore the advantage of position, wherefrom new amounts of kinetic energy may be developed and new work performed.

When it is maintained, that mechanical work can be equivalently transformed into heat, and that this same heat can, under favorable conditions, be again equivalently reconverted into mechanical energy; that, therefore, modes of energy are interconvertible, and energy consequently indestructible, the flaw in this interpretation of the actually observable facts is readily exposed. The external application of a certain amount of mechanical energy to a mass gives rise to the development of an equivalent amount of energy within the mass, called "heat." Thereby a certain tension or stress against cohesion is established. This operation places the mass in a definite state of advantage as

regards its capacity of performing work. An iron bar, for example, expanded by heating, and suitably fastened at both ends to a ruptured wall, becomes on contraction capable of performing the work of bringing together the two separated parts of the wall. The work is here evidently performed by the heat-expanded mass tending to reassume its normal state of cohesive equilibrium. In this process the amount of externally applied energy is spent in establishing the state of tension against cohesion, and it is the release from this state of tension which allows the expanded mass to develop the kinetic energy of cohesive recontraction, capable of performing work. In performing the work this special amount of kinetic energy is likewise spent and nowise conserved. In order to reestablish the tension from which new work can be performed a new application of external energy is required. Always, if new work has to be performed, new energy has to be brought to bear. An equilibrated state of masses, and of constituent elements of masses, can contain no latent energy, and can of itself develop none in this position. Energy is newly developed during equilibration of forcibly disequilibrated masses. And in performing work an amount of energy equivalent to the work performed is irretrievably spent and vanished out of existence.

These general preliminary remarks may at present suffice to indicate that there is something radically wrong in the conception of energy as generally accepted. This will clearly appear on further consideration. What is called the principle of the conservation of energy is in fact but another expression of the ancient dilemma contained in the conception of substance in general, as something that gives rise to changeful phenomena, while remaining itself identically unimpaired—

a state of things logically unthinkable and actually impossible.

Atomic mechanics, and its modern offspring "energetics," are consistent outcomes of the assumption of inert material particles, being the real elements that constitute perceptible, ponderable bodies or masses. The real existence of such inert matter granted, all actuation in physical nature must necessarily be imposed upon the inert masses from without by some immaterial, force-endowed agent, such as physical science conceives motion and energy to be.

It is important to recognize that the exactness of physical science, and its mathematical treatment, depend entirely on rigorously exact measurement. And this can take place only with the help of some kind of visible scales applied to visible objects and occurrences. The art of physical research consists mainly in discovering measurable signs for definite physical activities, and of devising and using instruments by means of which these signs can be accurately measured. The search for visible signs of physical processes, and the delicate art of exactly measuring their gradations when discovered, is an occupation which requires on the part of physical investigators the utmost ingenuity and application, evidenced by the formidable array of subtilly constructed apparatus, and volumes of mathematical equations. Physics is thus essentially a science of perceptible phenomena as revealed in terms of visibility. Vision is, however, only one among other endowments of the organic individual. Physical science, then, although it interprets nature as revealed by our most comprehensive and most accurate sense, can directly yield knowledge only as derived from what becomes consciously manifest as visual appearances. It can,

therefore, afford no exhaustive apprehension of natural phenomena.

In order to avoid the impression, that the criticism of the present interpretation of perceptible occurrences here attempted is meant to depreciate in the least the vast import of mechanical and physical science, and the signal service they have rendered to social progress and culture, let it be emphatically acknowledged, that by positively ascertaining through exact extensive and intensive measurements the distinctions and concatenations actually and invariably obtaining between the phenomena of the perceptible world and their manifold changes; that by such laborious research the conception of nature has been transformed for the benefit of mankind from a terror-haunted arena for the exercise of capricious activities on the part of malevolent and benevolent powers; transformed under dissipation of all manner of superstitions into an undeviatingly ordered cosmos, in which our life on this terrestrial globe may now pursue, nature-informed, a rational course, freed from the imaginative apprehension of willful interference from any extraneous source whatever.

Masses are more or less distinctly visible, and occupy definite stretches of space. They possess, however, also other properties, of which, besides direct visibility, actual tangibility is mechanically one of the most important. It testifies with certainty to a more or less intensive pressure-resisting and pressure-imparting power, which in various ways plays a significant part in mechanical occurrences. This eminently characteristic power attaching to bodily masses, when manifest here on earth in downward pressure or so-called gravitation, is rendered practically measurable by visible

gradations on weighing scales, whereby its determinate rate of efficacy is disclosed in relation to the entire terrestrial globe. Such direct weighing of masses yields, however, constant quantities only when carried on at the same spot. For weight-pressure depends on the relative quantities of the masses to be weighed against each other, and on the spatial distance they occupy in relation to one another. It is, therefore, a variable quantity. The pressure-resisting and pressure-imparting power of bodies is found to be a property they possess independent of their weight or special relation to the terrestrial globe, and directly dependent on the quantity of what is mechanically called their mass, which mass is something visible and tangible, and yet difficult to define, on account of its being in reality the bearer of manifold potential qualities.

The mass of a body suspended, and relieved thereby of its weight, offers still resistance to being moved, and when in motion resistance to this motion being accelerated, or to its being stopped. This occurrence is evidently due to a property itself invisible and only tactually revealed. The amount of resistance to being moved or accelerated affords a measure for the amount of mass involved in the process. And the amount of resistance to being stopped when in motion depends on the amount of the moving mass and the kinetic energy it embodies. Contrary to pure Phenomenalism it requires something efficacious to set masses in motion, and a further application of this efficacious something, generally called force, to accelerate the motion. And it requires again something just as efficacious to retard the motion, and more of it to entirely stop it. This something, called force, is directly and forcibly experienced and exerted by the investigator through mus-

cular push or pull applied to resistant masses. It is visibly embodied in a moving mass, which imparts motion and acceleration to another mass, that in collision with a third mass suffers thereby retardation or cessation of its motion. But here, as merely visually experienced, the pressure, resistance, and embodiment of force or energy on the part of masses is only inferred to exist, and not actually felt, as it is by means of touch. In the perceptual sphere of pure vision the bodies appearing therein, consisting, as such, only of definite modes of space consciousness, neither press, nor resist, nor embody anything like force. Hence the immaterial, forceless Phenomenalism of pure visual physics, as mathematically formulated.

A mass falling to the earth acquires thereby increasing increments of pressure-imparting power or kinetic energy corresponding to the height of the fall. This remarkable, and it may be added enigmatical occurrence, may be considered the central experiential datum, upon which the theoretical structure of mechanics is erected. It presupposes on the one side that a uniformly acting invisible force imparts accelerating motion or velocity to the falling mass; and, on the other side, it discloses that the falling mass acquires thereby an increasing invisible power, manifest only in the growing velocity becoming perceptible in relation to other masses; a power by means of which it is rendered capable of performing actual perceptible work upon other masses, causing them to undergo changes of various kinds.

It is, moreover, found that a falling mass, which has acquired thereby a definite store of kinetic energy, if prevented from actually falling upon the earth, as is the case with a pendulum, that it then spends its invis-

ibly accumulated kinetic energy in performing work against the force which is drawing or pushing it towards the earth. It visibly performs this work by lifting its own weight to nearly the same height from which it started to fall, spending thereby its entire amount of kinetic energy. It cannot be rationally expected to lift its weight to a greater height than that from which it fell, for where would the additional energy required come from? The experienced circle of occurrences here presented proves that the invisible efficacious something attaching to a mass in motion is capable of performing in connection with it an amount of work equivalent on the one hand to the velocity of the mass acquired during its fall, embodying therewith an amount of kinetic energy, gradually accruing, and to all appearance newly produced. On the other hand, this developed kinetic energy is nearly equivalent at the lowest point of the fall of the pendulum to the energy that originally raised its mass to the spatial point of downward departure; *nearly* equivalent because of the retarding influence of friction at its point of suspension; a factor which plays an important part in the occurrence. For, ever so much diminished, friction inevitably brings at last the pendulum to a standstill. Friction consumes energy like all other action against resistance, and energy can no more perform work without being spent, can no more be itself a *perpetuum mobile*, than any other second-hand working power.

Right here the fundamental error in the current conception of energy, as an indestructible entity that preserves its identity and quantity unimpaired amid the changes to which it is held to give rise — right here this fundamental error in the theory of the conserva-

tion of energy becomes evident on close scrutiny. A pendulum acquires a certain amount of kinetic energy during its fall towards the earth. It spends this entire amount of energy in lifting its own weight against the resistance of gravity and friction to nearly the height from which it fell. How, then, can this same amount of energy, wholly spent against gravity and friction, be, nevertheless, as generally alleged, — found conserved in undiminished quantity as "potential energy"? This is clearly impossible. A quantity of something spent by any agent whatever cannot remain an undiminished identical possession of such agent. And yet it is maintained by leading physicists, that the kinetic energy of the rising pendulum, though spent in lifting its weight against the resistance of gravity, has been actually converted in undiminished quantity into potential energy, and that during its renewed fall this potential energy becomes reconverted into kinetic energy, and so on. The conclusion therefrom is, that the assumed entity, called "energy," is identically conserved as an indestructible work-performing agent.

Now the real state of things is quite otherwise, and very obvious. The pendulum lifts its own small weight against the comparatively enormous power of terrestrial gravity. This power steadily counteracts and finally arrests the upward motion of the pendulum; whereupon, instantly, this same preponderant power draws the weight of the pendulum downwards again, during which fall an entirely new amount of kinetic energy becomes developed. This is obviously what really occurs, and the conception of a mutual conversion of kinetic into potential and of potential into kinetic energy is a pure fiction. The entire energy acquired during the fall of the mass is in relifting it

unambiguously spent against gravity, and has as such vanished out of existence. During the next fall it is altogether newly produced by the accelerating influence of the same gravity against which it spent its former accumulated kinetic energy. Gravity is, in fact, an inexhaustible source of actuation, capable of imparting ever so often new kinetic energy to ever so many falling masses.

When a weight is lifted by the external application of energy to a certain height, as is the case with the pendulum when first started, it is maintained consistently with the principle of the conservation of energy, that this externally applied kinetic energy is converted into the potential energy of position, and that it is this same potential energy which during the fall of the weight is reconverted into kinetic energy. Here the influence of gravity is evidently lost sight of. As the pendulum is here regaining over and over again its position of advantage without further external assistance, it must -- under this conception -- be the originally applied external kinetic energy that is being over and over again reconverted into the potential energy of position. But, if so, then the kinetic energy developed at the same time by the influence of gravity would be quite superfluous. If, on the contrary, it is the influence of gravity which during the fall develops the kinetic energy which lifts the pendulum to its position of advantage, what has become of the externally applied energy? And what becomes in general of the externally applied energy that places any mass in a position of advantage -- that bends a spring, that expands the volume of a mass, that establishes modes of tension or stress in the magnetic field?

The impossibility of any amount of energy disappear-

ing without producing an equivalent effect affords the principal inducement for accepting the theory of the conservation of energy. But it is a mistake to believe that the work wrought by energy embodies the same amount of identical energy by which it has been wrought. Energy is wholly spent in establishing positions of advantage. And the energy which a mass may then develop from this position of advantage owes its production entirely to the state of tension or stress established, either in relation to other masses, as is the case with gravitation and electricity; or in relation to an intrinsic property of the mass itself, as is the case with elasticity and cohesion. The power inherent in equilibrated masses, enabling them within certain limits ever so often to resist disequilibrium; this intrinsic power possessed by masses is inalienable, inexhaustible, and inconvertible. It can nowise be accounted for by energetics.

The state of things here pointed out positively contradicts the principle of the conservation of energy. Yet it is, nevertheless, certain that no *perpetuum mobile* can be constructed, and that there obtains equivalence among all links in a chain of work-performed changes. The reason, however, why a *perpetuum mobile* cannot be constructed is, not because energy has been conserved, but because in doing work it is, on the contrary, spent and used up. And the reason why the work performed is equivalent to the work-performing energy is, not because the latter has been converted into the former, but because it cannot spend itself or be used up without performing and leaving behind an equivalent amount of work. If the work performed consists in establishing a position of advantage through disequilibrium of an existing state of equilibrium among or

within masses, then kinetic energy may be developed therefrom, and new work performed in the process of reëquilibration. If, on the contrary, the work performed consists in regaining a state of equilibrium, then, the equilibrium once gained, the equilibrated masses can develop no new energy, and can perform no new work without redisequilibration being established by a new application of external energy.

In corroboration of the view here advocated, take the energy developed by an unbending spring. It is evidently developed from a position of advantage. The spring had to be forcibly bent by application of external energy overcoming the resistance to deformation on the part of the elastic mass, whereby the position of advantage was gained, from which energy could be developed and work performed. The energy developed and the work performed is here clearly due to the elastic force of the spring, a specific property of this peculiar mass. By means of it, it forcibly recovers from its state of reformation, regaining thereby its original state of equilibrium. Nowise is the externally applied energy here at work. It was wholly spent in bending the spring, and is certainly not operative in the following rebound of the elastic mass, which is entirely due to its own intrinsic endowment. In order to replace the elastic mass in a position of advantage, without which it is impotent to perform new work, a new application of external energy is each time required, and each time wholly spent in its effort of overcoming the elastic resistance of the spring. While, on the contrary, the elastic mass of the spring performs with undiminished power, each time it is bent, the work of opposing or resisting its deformation and of operating the energetic rebound; and all this from out its own inexhaustible

intrinsic endowment of what is called elasticity. Without recourse to this inexhaustible power the kinetic theory of gases can make no sense out of given phenomena. And to have recourse to it contradicts outright the theory of atomic mechanics, and also that of energetics.

It was the seeming conversion of mechanical energy into heat, and the reconversion of this heat into an equivalent amount of mechanical energy, that has played the most prominent part in establishing the doctrine of the conservation of energy. It will, therefore, conduce to a clearer understanding of what "energy" signifies to expose the fallacy involved in the current interpretation of the given facts. It has become almost self-evident that, if mechanical work applied to a mass raises its temperature to a certain degree, this definite amount of change wrought in the constitution of the mass, and generally believed to consist in a mode of motion of its constituent elements felt by us as heat — that this heat-motion will not disappear without producing equivalent changes. The way the theory of the conservation of energy interprets the experimentally ascertained equivalence of mechanical energy and heat is by assuming their essential identity. It maintains that the mechanical energy applied to the mass is itself converted into the heat-energy, and that this same heat-energy could under most favorable conditions be reconverted into equivalent mechanical energy. And this, if it were true, would prove that energy is an indestructible entity, whose modes are interconvertible; that, in fact, it is identically conserved, despite all the work it may perform.

That this interpretation is radically erroneous can readily be shown. Mechanical energy, such as friction,

applied by one mass to another mass, does not really detach itself from the rubbing mass to slip over into the rubbed mass, becoming itself converted into heat. The mechanical energy is, on the contrary, wholly spent in developing heat-energy in the mass to which it is applied. This heat-energy is altogether an outcome of intrinsic reaction on the part of the mass to which the mechanical energy has been applied. The developed heat-energy is in its turn spent in expanding the mass in which it is incited, or in changing its state of so-called aggregation. On recontraction of the mass to its former equilibrated dimensions heat-energy becomes newly developed and wholly dissipated among adjoining masses; or rather the heat-motion becomes gradually arrested through its action upon adjoining masses. It can nowise as this identical heat be reconverted into mechanical work in the sense implied in the principle of the conservation of energy. Instead of conservation of energy there is here consumption of energy, and development of entirely new energy, by which no mechanical external work is or can be performed, so long as the recontraction of the mass is equivalently in operation. To a correct understanding of physical processes it is essential to recognize that no work can be performed without the energy performing it being spent or used up thereby. In the case under discussion it has been spent in every stage of the occurrence; first in the work of expansion or disaggregation, and then in the work of recontraction, leaving no energy available to be reconverted into external mechanical work; such as that applied in initiating the process. This initiating external energy was used up in overcoming the resistance of cohesion, and it was the intrinsic power of cohesion, which, when no longer counter-

acted, furnishes the energy developed during recontraction of the forcibly expanded mass. Forcible disequilibrium among and within masses, and forcible reëquilibrium on release of the disequilibrating tension or stress, is that which furnishes the moving power in physical processes. Disequilibrium is imposed upon masses from without, reëquilibrium takes place from within their own sphere of intrinsic endowment. The validity of this mode of interpretation, so completely at variance with the principle of the conservation of energy, shall presently be rendered still more clearly evident.

The "molecular" heat-commotion, sensible as such, and also measurable in its effects on other masses, is conceived as kinetic energy capable of doing work. The work it immediately performs consists in counteracting the power of cohesion which binds the constituent elements of a mass forcibly together. The visible outcome of this work carried on within the mass is its expansion or disaggregation. In measure as the conjectured molecular motion slackens, or — what is the same thing — in measure as the mass cools down to its initial temperature, its intrinsic property of cohesion gains the ascendancy, and the mass forcibly contracts to its original volume. In case no more energy were applied to a mass as is exactly required to expand or to disaggregate it, and in case it were furthermore possible to confine the heat commotion thereby aroused altogether within the expanding or disaggregating mass, then the sensible result of the process would be simply expansion unaccompanied by what becomes sensible as heat. As proved by Sadi Carnot, and as deducible from ascertained premises, when mechanical work is performed by the kinetic energy of heat, heat

itself, which without performing such work, would be externally sensible, wholly disappears as such. It is, in fact, used up as energy in the work it performs. It is not latently retained in the expanded or disaggregated mass as Black once thought. Heat, conceived as a mode of motion, is here simply arrested by counter-acting resistance, and exists no more. A forcibly expanded or disaggregated mass is itself in a state of intrinsic disequilibrium. But it is also disequilibrated in relation to surrounding masses. It can maintain its disequilibrated state only by means of a continued application of external energy, because in order to maintain at the same time its state of disequilibrium in relation to surrounding masses, a great part of the energy externally aroused in it is thereby consumed. The result of this action upon surrounding masses becomes sensible as heat or pressure. The mass can regain its former equilibrated state of cohesive contraction only in being allowed to cool down by discontinuing the external application of energy, in which case its reëquilibration in relation to surrounding masses evinces itself in so-called dissipation of heat or cessation of pressure.

And here, in mentioning the still current expression, "dissipation of heat," it may be opportune to remember that heat, being a mode of activity, and not an entity or substance as formerly believed, can no more detach itself from the mass which manifests it, and of which it is the activity, than any other mode of activity. Activities are inseparable from that of which they are the activity, and they are all visually revealed to the investigator as modes of motion inseparably attaching to the masses which are their actual bearers. The heat-commotion arising within a contracting mass be-

comes gradually arrested and eventually stopped by its action upon surrounding masses. Imagine, now, that the entire process of expansion, and that of recontraction, were taking equivalently place exclusively within the mass itself without waste through external action. In this case, as already stated, the expansion or disaggregation would occur without becoming externally manifest as sensible heat, the entire heat-energy being consumed in the intrinsic work performed. It is certainly not latently conserved in the expanded mass. But in the process of recontraction by force of cohesion new heat-commotion will necessarily be produced, for, without such retrograde, readjusting process, no return to the original state of cohesive equilibrium could be effected. The mass would remain forever expanded. This new heat-commotion, necessarily accompanying recontraction, amounts to an entirely new-production of kinetic energy, comparable to that developed in the fall of bodies. Necessarily this intrinsic activity constituting the kinetic energy of heat, and conceived as motion, has to become arrested in order to allow the recontraction of the mass to take place. This retrograde process is externally felt as the cooling-down of the contracting mass, which really means that the heat-commotion is as energy consumed in working heat-effects in surrounding masses. As soon as the cohesive equilibrium of the mass is restored, all forcible activity, all heat-commotion, all manifestation of energy ceases in the mass itself, and in relation to its surroundings. And nowhere is the energy which was operative in the process latently or potentially conserved.

There obtains in the case examined, as in all other physical occurrences, complete equivalence in all stages

of the process, but no reconversion of an identical amount of heat into the identical mechanical energy which gave rise to it. All that the externally applied energy could accomplish was to place the "molecules" of the mass in a position of advantage or stress against the counteracting force of cohesion, allowing thereupon, on release of the stress, kinetic energy to be developed by the same inexhaustible cohesive force. If during the process of contraction the level of heat-commotion persisted at any moment undiminished in the expanded mass, instead of becoming arrested by its action upon surrounding masses, no further contraction could take place. The contracting energy of cohesion would then be equivalently counteracted, and the mass would remain in a new state of equilibrium. Such a new state of equilibrium would actually be gained in case the temperature of the surrounding masses were raised to the level of that of the mass in process of contraction. Hence the necessity of a lower level of temperature in surrounding masses in order that the heat-commotion of the mass to which external energy is applied may be enabled to perform work. This state of things, pointed out by Carnot, follows simply from the general fact here elucidated, the fact that equilibrated masses can develop no energy; energy being only developed in the course of equilibrating activity.

It is important to accentuate in this connection, that the heat, incited by mechanical energy applied to a mass, can nowise be reconverted into mechanical energy, as assumed by the theory of the conservation of energy. Mayer's reasoning, and Joule's experiments, hold good only as regards the equivalent development of heat-commotion by means of mechanical energy. The reconversion of this same identical heat

into, for instance, the mechanical lifting of an external mass to a certain height — this reconversion is for various reasons a downright impossibility. When external work is actually performed by an expanding mass which lifts another mass to a certain height, the resistance to displacement on the part of the other mass has to be overcome by the development of an amount of heat-energy within the expanding mass additional to that which would have expanded it when not performing external work. Without this additional heat-energy it could perform no external work.

The performance of work against equilibrated masses necessarily involves the consumption of the energy performing it. When equilibration is attained, the activity which brings it about consequently ceases. And when this activity is physically conceived as energy or as motion, then as soon as the task of equilibration has been accomplished, the energy has therewith been consumed, and the motion has come to a standstill. No conservation of energy, and no interconversion of its modes, takes place anywhere in nature.

The underlying problem here involved concerns the true nature of that which constitutes the forcible tension or stress as naturally or artificially established between or within disequilibrated masses; which tension or stress allows on release the forcible work of equilibration to take its course. The perceptible visual sign of this energetic activity is for our conscious apprehension simply a mode of motion. To the inferred impelling cause of the activity the name of "force" is physically given, and the power of the activity to perform work is called "energy." A further essential condition underlying physical activity is the intrinsic nature of the masses displaying such specific properties,

as gravity, cohesion, elasticity, electricity, and chemical affinity.

Besides the epistemological considerations just pointed out, three principal facts fatal to the theory of the conservation of energy were disclosed during the course of this discussion; which same facts are likewise fatal to atomic mechanics, and fatal, indeed, to the entire scheme of mechanical interpretation, when assumed to be a true and adequate explanation of physical occurrences. These facts are: first, the inseparability of an activity from that of which it is the activity; second, advantage of position due to forcible disequilibrium; and third, the intrinsic inexhaustible power possessed by masses to resist and counteract over and over again with undiminished efficiency, within certain limits, any external disturbance of their equilibrated state. The position of advantage of a mass in relation to other masses, or in relation to their own constituent elements, cannot be what is physically understood as "potential energy," even if the implied and declared inertness of masses, and, therefore, their incapacity of harboring latent energy when at rest, is left out of account. The advantage of position of a mass does not consist in its embodiment of latent energy. It is merely a starting point; wherefrom, on release of the tension which constitutes the advantage of position, kinetic energy may be developed in masses through activities set going within and between them. Forcible and constant resistance to disequilibrium on the part of masses; their resistance to being forced into a state of separation, distortion, disaggregation, or dissociation, is that which gives rise to tension, and which on return to equilibration develops the motion embodying kinetic energy. The tension is directly felt in the

resistance experienced and steadily maintained in lifting a mass, in bending a spring, in pulling an elastic cord, in separating the armature from a magnet. In fact, advantage of position, or forcible tension or stress naturally afforded or artificially established, is the mainspring of all activity in perceptible nature. If all tensions or stresses constituting positions of advantage were released, and in consequence equilibration among masses fully established, there would inevitably result utter stagnation, complete inactivity.

No such result can possibly occur on our globe, for it subsists with all its manifoldly and specifically constituted parts in interdependence with the entire cosmos, and quite especially in close interdependence with the turbulent masses that compose the sun, and also most directly in interdependence with the intervening medium called "ether." The principal power which is unremittingly counteracting equilibration in terrestrial masses, establishing renewed and new stresses in and among them; placing them thereby in positions of advantage from which renewed and new changes may be wrought; this mighty power is that known as "radiant energy." Radiant energy is incomparably the most effective change-producing influence reaching our globe, and manifest here in a multitude of various effects, grouped under the names of light, heat, electricity, chemical action, and pressure. It is generally believed that radiant energy is emitted from the sun and other stars, and is conveyed to the earth by an intervening medium, itself specifically indifferent, and merely transmitting it. But as no activity can possibly detach itself from the mass or entity of which it is the activity, it is clear that radiant energy cannot consist of an activity emitted from the sun as something

detaching itself from it, making its way as such through an indifferent medium, and reaching the earth as the same identical something. The theory of detached motion, energy or electricity traveling along as separate entities is rationally untenable. Radiant energy, as something revealed in its various sensible effects, can be only a specific activity incited in whatever constitutes the interstellar medium; an activity whose physical modes of actuation are altogether an outcome of the medium's own specific endowment. This medium under the name of "ether" is being more and more fully recognized as constituting an inexhaustible magazine of supremely potent energy, whose interaction with ponderable masses — themselves seemingly products eliminated from it — gives rise to the perceptible phenomena of nature which become consciously revealed to us, and which as such form the objects of physical research.

The demonstration of stresses and modes of interaction between what are consciously realized as ponderable masses and the inferred imponderable bearer of radiant energy; a scientifically ascertained fact which essentially agrees with the view here advocated, and entertained by the present writer for more than a score of years; this positive fact has recently led physicists to formulate a theory of the constitution of perceptible masses and their changes wholly at variance with that of inert material particles mechanically energized by modes of motion.

A much more consistent and profound theory of cosmic evolution, or rather of cosmic elaboration and development, may be constructed from the data here brought to light, than that which has been derived from atomic mechanics, or from energetics. The quali-

tative or specific elaboration of power-endowed masses is of far greater import to nature and to life, than would be a mere mechanical grouping of inert atoms, or the mere transformation into different guises of one and the same identically abiding factotum.

In this connection it is instructive to recognize that human inventions and contrivances, making up as they do the medium in which social progress is rendered possible, are realized by artificially placing suitable masses in new positions of advantage towards one another, whereby new and humanly serviceable effects are made to arise.

Radiant energy, manifest in its various effects among masses, has especially through its heat effects power to convert solids into liquids, and liquids into gases, and it has especially through its electrical effects power to dissociate chemical combinations, fracturing, moreover, the so-called chemical elements into immensely smaller units. The inference lies near that radiant energy, if still more intensely and advantageously at work, would have power to efface still more radically differences obtaining between elements of masses. This inference seems corroborated by the simple spectrum of glowing nebulae. And it has lately become more than probable that the "atoms," or rather the chemical units of radium, become gradually more and more broken up so as partly and finally to be converted into the very primitive element "helium." Such facts have again suggested the theory, put forward long ago on other grounds, namely, that all chemical compounds result from multiple combinations of one single kind of primordial element. But difference of constitution is an essential characteristic manifestly underlying the chemical bond of union between masses, giving rise by

force of what is called "affinitive attraction" to new and different kinds of "substances."

A very few kinds of so-called elements are found to combine in multifold ways, so as to form a vast number of strikingly different products, as witnessed in hydrocarbons and other organic substances. The formation of a multiplicity of specific compounds by only a few so-called elements has been generally attributed to definite different modes of their accouplement and spatial arrangement. More recently each "atom" of so-called elements is considered to be composed of an entire system of far more primitive units, distinguished from one another by carrying with them different numbers of the units of which electrical charges consist, or possibly consisting themselves altogether of such electrical charges. Under this view a justified interpretation of the multiplicity of specific chemical compounds, formed by only a few of the so-called chemical elements, would be that each different "chemical combination" of one or the other part of their dissociated primitive units would form new specific compounds with new modes of affinitive attraction to the rest of the units, and would after such specific chemical union display new modes of action and reaction. The underlying contrast of characteristics giving rise to affinitive attraction becomes here among the primitive units manifest as what are called negative and positive electrons, the latter being probably not separate entities but belonging to the stable matrix from which the former are disequibrated constituents. From these considerations it would seem to follow, that radiant energy, if brought to bear in full concentrated force upon ponderable masses, would act as a solvent capable of absorbing them all into the common medium.

The reverse of this process of dissolution of ponderable masses, and their incorporation into the common medium, would then be a kind of differentiation, precipitation, or crystallization of most primitive elements, assuming thereby the characteristics of mass, and establishing by force of their segregation disequilibrium-stresses within their emitting medium. Modes of interaction among themselves, and in relation to their cosmic matrix, would then give rise to the elaboration of the perceptible phenomena of nature, and their physical manifestations.

These seem to be legitimate inferences from what has been called the new theory of matter. But it must not be lost sight of, that such ponderable stuff, and its manifest specified appearances, are revealed to consciousness merely in terms of our visual and other sensible awareness. We are, in fact, directly aware of nothing but the effects of activities that take place in the realm of extra-conscious subsistence and creative operations. The physical effects are perceived as measurable masses and their interdependent motions. In ultimate analysis what is thus perceived in direct awareness dissolves into purely perceptual phenomena, whose definite behavior in time and space-perception allows us symbolically to conjecture what is really occurring in the realm of extra-conscious, power-endowed existence.¹

¹ See "Monera and the Problem of Life" "Popular Science Monthly," 1878; "The Dual Aspect of our Nature" Boston "Index," 1885; "Is Pantheism the Legitimate Outcome of Science?" "Journal of Speculative Philosophy," read before the Concord School of Philosophy, 1885; "To be Alive, What is it?" "Monist," 1895.

V. HOW MECHANICAL NECESSITY BECOMES OVERRULED IN NATURE

IN the introductory section it was admitted that "so long as the necessitarian contention of natural science cannot in its own field be proved to have been due to a mistaken interpretation, it will stand an impregnable bulwark against all attempts at scientifically or philosophically justifying free human self-determination."

In fact, the conception of necessary causation applied to the phenomena of physical science is likewise applied to those of psychical science. Rigorous determination of consequents by antecedents in the psychical sphere, of effects by causes in the physical sphere, seems to leave no room for any breach in the necessitarian, and therewith fatalistic, concatenation of all natural phenomena. Everything that happens in nature is said to have a definite efficient cause, and is, therefore, necessitated. Nothing whatever can then happen without being thus necessarily caused. This, indeed, is the all but universally accepted view.

As to the strictly mechanical interpretation of physical phenomena, inert atoms coerced with absolute necessity into changing spatial arrangements by force of imparted and transferable motion, is all it has to offer wherewith to construct nature. It seeks to account for all *perceptible* occurrences *at least*, by ascribing them to mere changes in the distribution of an unchangeably given number of material atoms, or of

some kind of unchangeably given ultimate units assumed to compose bodies or masses, actuated by a definite unchangeable amount of motion unequally apportioned among them, and manifest as the direction, velocity, and mechanical effects of the moving masses. It follows that the sum total of all atoms or units composing masses, and the total amount of motion actuating the changes, remain both absolutely equal in each succeeding moment of time. This state of things involves consistently, that that which occurs in the present moment is essentially equal to what immediately preceded it; and that the entire succeeding series of changes in the future will be at each link of the causative chain always equal to its immediately preceding cause; "*causa æquat effectum.*" If motion is, as here assumed, the sole actuating agent in nature, then that which is moved, of whatever it may really consist, must necessarily be itself inert, passive, and devoid of qualitative distinctions. All manifest distinctions, then, are necessarily held to be mechanically due to different modes and amounts of motion, giving rise to definite spatial groupings of the implicated inert units.

Modes of motion are distinguished from one another by the different directions and different velocities imparted to masses and to their constituent elements. This being so, how from these meager factors and conditions the astonishingly varied and specific qualities of definite bodies or masses can possibly result is wholly unthinkable. Rationally unthinkable also, as shown in the preceding section, is motion itself as a separate entity detachable from moving masses, and as being the real agent that moves or actuates them. Motion detached from mass, and conceived as being a self-

existing and force-endowed entity, is clearly a mere conceptual fiction, to which nothing actually experienced is found to correspond. Surely such a thing as motion detached from mass is an airy nothing without a local habitation. And how, indeed, can a moving mass be really moved by the motion it carries along with it?

It was, on the contrary, found that masses, far from being passive and inert, are themselves specific agents endowed with inexhaustible efficiencies, by force of which they move in definite ways whenever disequilibrium of their statical relations to one another, or disequilibrium of their own intrinsic static constitution, takes place. A mass moves towards the earth when it has been forcibly separated from it, and is thereupon regaining its statical equilibrium. A spring unbends, and moves in consequence, when it has been distorted out of its equilibrated state. A mass moves by being forcibly struck or impelled out of its equilibrated position, and comes to rest when it has reached a new equilibrated position. It is not the grouping of inert particles by force of motion, nor the entrance into masses of an indestructible something called "energy;" it is the masses themselves that manifest as endowment of their own the sense-revealed activities and the qualitative properties consciously recognized as such.

It is an undeniable fact that masses of different chemical constitution, or the same mass in different states of consistency, possess different perceptible qualities, and display specific modes of action and reaction. Hydrochloric acid, for instance, possesses strikingly different qualitative properties from those of separately existing hydrogen and chlorine of which it is composed; or from any other chemical element or compound.

These specific qualitative differences can nowise be accounted for by the mechanical theory. They cannot be simply due to different modes of motion imparted to the inert elements of masses, or to any mode of their spatial arrangement. Nor can they be due to qualitative modes of appearance of the assumed factotum "energy." The modes of action and of reaction of definite masses are specific and manifold, and are due to inherent properties of their own.

The specific properties inherent in bodies or masses, evidenced by their peculiar qualitative appearance, and by their peculiar modes of action and reaction, are obviously that which is most essential in nature, far more so than mere mechanical causation would be, despite its preëminent importance to physical science. It introduces with each new formation of chemical compounds, and with each new disturbance of equilibrated states, essential modifications, and developmental changes and potencies in the enchainment of causes and effects, rendering possible progressive evolution, which could not take place through mere mechanical means, whereby everything would be rigorously pre-determined in a purely mechanical world. The specific modes of constitution and specific modes of action and reaction of masses brought newly into existence by means of chemical composition, or by changes of equilibration, are the essential prerequisites to progressive development.

Newly arising, specifically different, modes of being prove, in fact, to be of decisive importance in the course of cosmic evolution, or rather in the course of the qualitative elaboration of perceptible nature. We have here a kind of epigenesis similar to that occurring in the development of organisms from their germs. Pre-

vious formations serve as foundation for succeeding developmental stages. These new formations become causative agents operative in the arising of a multiplicity of natural phenomena not previously manifest nor previously mechanically necessitated. Such new formations, endowed with new properties, are evidently not the mere mechanically equivalent effects of inert particles knocked into peculiar spatial arrangements by modes of motion. And even if their formation could possibly be accounted for by the mechanical theory, they would by force of their specific modes of action and reaction enrich the purely mechanical world of measurable quantities with an interpolation of mechanically unaccountable qualitative phenomena, nowise necessitated as outcomes of mechanical causation. That, for example, the combination of hydrogen and oxygen should result in the formation of a liquid which displays properties entirely different from its composing elements, manifest in manifold modes of specific action and reaction; a liquid which forms our seas, lakes, rivers, clouds, and rains, and which is an indispensable, paramount formative component of living organisms; all this and everything of the same kind that has imparted to the originally homogeneous world-stuff specific differentiations, which have entered into the construction of the terrestrial globe, and into the multiplicity of its definite formations, each endowed with newly acquired properties; all this accruing diversity of forms and potencies is certainly of hyper-mechanical origin, and breaks most effectively through a concatenation of occurrences where effects are deemed to be strictly equivalent to their causes.

To be sure, when once formed, the modes of action and reaction of the new formations strictly conform to

definite ways predetermined in their own constitution, and in their definite relations to the environment. Such specific modes of constitution and of activity, newly introduced into the perceptible world, display a multiplicity of different phenomena, in response to different occasional incitements from without, and are consequently mechanically incalculable and unpredictable. Who could have mechanically foretold and calculated that such a harmless substance as glycerin combined with so chemically torpid a substance as nitrogen, would be capable on dissociation to be causing such tremendous mechanical effects. The nexus of cause and effect, declared to be rigorously necessitated, would hardly have come to produce, artificially unaided, this dread substance, consisting of components derived and brought together in eminently artificial ways by human effort. And it is obvious that our progressive civilization and culture are mainly the outcome of inventive interference with what is scientifically held to be the necessitated course of mechanical causation. But nature, artificially unaided, has at every step of her developmental changes introduced new formations into the causative nexus, which have essentially modified pure mechanical necessity in qualitatively incalculable ways. Of these necessity-modifying, hyper-mechanical formations our own organic being affords the most conspicuous and prominent example, having in the course of its vital development become a performer of volitionally aimful actions in relation to a highly complex environment, and a bearer and interpreter of the entire phenomenal world, arising in its all-revealing consciousness as reactive response to the multifold inciting calls of the great outside world.

With the recognition of this last-mentioned incon-

testable truth; the truth, namely, that the world as actually perceived by us is a phenomenon arising in each of us as individual awareness; with this most enlightening recognition, the question of mechanical necessity and qualitative development discloses itself as far more profoundly complicated than has as yet been indicated in this section, and as generally recognized by scientists. The world we perceive and apprehend, with all its qualitative and quantitative appearances, becomes therewith ideally transfigured; being found to exist as conscious phenomenon inside, and not as a foreign something outside our own being. With regard to qualitative distinctions as actually perceived, it has become philosophically certain, and generally acknowledged, that they are altogether of subjective sensorial origin. Qualities seemingly attaching to outside existents, such as colors, sounds, smells, tastes, of all varieties, and also all that is tactually felt, are one and all mere modes of transient conscious awareness. Unless, then, these sensations, which make up the things and qualities we are directly conscious of, correspond as revealing signs to extra-conscious existents and their specific characteristics, they can have no cognitive validity reaching beyond themselves, and would be in this case incapable of yielding the rational information upon which we rely in our conduct of life. The mechanically necessitated world, if it really existed, would, despoiled of qualitative distinctions, and regardless of conscious awareness, run its purely quantitative course among nothing but indestructible inert atoms actuated and grouped into bodily formations by the indestructible agent called "motion."

This interpretation, that has seemed so satisfactory

to physical science, and which is still advocated by most scientists, is as an explanation of the real state of things wholly upset by recognizing, that just as certain as perceived qualities are modes of subjective sensorial awareness, just as certain are also all modes of perceived motion, and all kinds of perceived masses, mere modes of subjective sensorial awareness. Perceived motion, the only motion we have actual knowledge of, forms indubitably likewise part of the percipient's conscious content. Motion can, therefore, nowise be an all-efficient agent such as mechanical science makes use of as its factotum. It is, in verity, a mere forceless, transient perceptual sign of extra-conscious activities. This philosophical truth is conclusively established, and has in future to be reckoned with by physical science. In fact, a number of scientists are already making their solemn bow to the ever-intruding specter of "Erkenntnisstheorie" looming in the background. In this treatise it has at length been shown, that we are fully justified in inferring that modes of motion are conscious signs signaling definite modes of activity at work in the realm of extra-conscious existence.

The immediate objects of physical research, as actually present in consciousness, are as such perceptual signs of definite modes of activity inferred as occurring in and among extra-conscious existents. These conscious signs of extra-conscious activities, consisting of perceived or conceived modes of motion, are themselves forming part of definite percepts occupying visual space. It is with the visibly revealed characteristics of extra-conscious existents that physical science mainly occupies itself. And here it is important to mention again, that the visible phenomena are

not themselves in any sense causative agents. For instance, what are called vibrations or waves of air or ether are only visibly experienced forceless signs of the existence and activity of real agencies that affect in specific ways our visual or auditory sensibilities. What are here recognized, for example, as definite wave-motions of air, and found to correspond to definite auditory percepts or sounds, are in truth exclusively visual phenomena, — phenomena expressed in terms of visual perception. Such visual perception cannot possibly, as generally maintained, be itself the real agency that affects our auditory sensibility. A visual phenomenon, itself an utterly forceless mode of conscious awareness, cannot give rise to an auditory phenomenon, an entirely different, but likewise forceless mode of awareness. The auditory phenomenon, the sound, is evidently aroused by the same extra-conscious agency that simultaneously also arouses the visual phenomenon appearing as wave-motion.

All effects of radiant energy or activity are physically expressed in terms of visual awareness perceived or conceived as definite modes of motion. Its otherwise manifold causative efficiencies are, however, recognized, not only as being directly and exclusively effects wrought in our visual sensibility as mere modes of motion; they are, moreover, recognized as manifold disparate qualitative effects: luminous, chromatic, thermal, chemical, electric, magnetic, and even as causing inertia, which seems to have been recently ascertained.

Physical science strives to reduce all perceptible phenomena to purely mechanical laws by seeking to express them in terms of visual perception, whose modes of space occupancy and modes of motion can

be rendered accurately measurable, and subject to mathematical treatment. Physical science transmutes thereby the abundant wealth and multifold potencies of perceptible nature into a visual Phenomenism made up of nothing but moving phantoms. But, it may be asked, how can mere transient visual phenomena be at all measured, and how can any manner of scales be applied to them? The condition indispensably underlying the possibility of physical measurement is found, not in the surface play of fleeting phenomena, but deep down in extra-conscious nature where all creative or formative work is wrought and permanently sustained.

This *conditio sine qua non* underlying the measurement of transitory visual phenomena is found — as explained in a former section — in the genuine substantiality of the living matrix whence the visible appearances issue into actual awareness, and are there identically sustained by continuous reproduction. Unless thus identically sustained within actual awareness by means of constant reinstatement, no measurement of natural phenomena would be possible, no exact physical science attainable; indeed, no kind of rational conception of nature and life formed.

Surely, it is certain that no manner of scales can be directly applied to visual phenomena, to mere conscious appearances. If these were self-sufficient ideal existents signaling nothing beyond themselves, no kind of measuring apparatus could be applied to them. Ideal phenomena can evidently nowise be manipulated, and there is here actually in sight nothing but visual phenomena within subjective awareness. What, it must then be asked, is really weighed, to what are scales in verity applied, what is actually placed under the micro-

meter, or measured by any kind of appliance? The answer is plain. Scales, not merely as perceptually present in consciousness, but as real extra-conscious existents, are handled, not by what is consciously perceived as our organism, but by our real extra-conscious being, and are directly applied, not to our visual percepts, but to the extra-conscious existents signaled by them. Fancy a physicist weighing his own visual percepts, or a biologist placing them under the microscope!

While recognizing the vast importance of physical science, as a doctrine yielding positively reliable information regarding perceptible nature, it can, on the other hand, not be denied that it reduces the multifold specifically, qualitatively, and efficiently distinct existents and potencies of the real world, to the single meager effects produced by them in the medium of mere visual sensibility, where it deals only with definite spatial percepts undergoing relative modes of motion. Thereby is dropped out of sight and consideration all that is most important, efficacious, and diversely specific in nature.

Physical science as at present constituted can, therefore, not be accepted as an adequate interpretation of the perceptible world. Nor does its alleged unbroken necessity and equivalence of occurrences, as figured out in an endless chain of mere mechanical causation, hold good at any stage of the developmental process in real creative, extra-conscious nature, to which all perceptible things, we ourselves included, owe their gradual elaboration and present existence.

Qualitative developmental elaboration of extra-conscious, interdependent, and interacting power-

endowed existents is the essential fact to be recognized in perceptible nature, not interpretable as the mere necessary and causatively equivalent concatenation of mechanically moved inert masses.¹

¹ See "The Dependence of Quality on Specific Energies" "Mind" Jan., 1880. "Is Quality the result of difference in the numerical addition and position of qualitatively equal units, and therefore a mere function of quantity? Or is Quantity itself some kind of primitive quality, the multiple discrimination of an indivisible qualitative unit? This is precisely the problem."

Also "Automatism and Spontaneity" "Monist" Oct. 1893. "Are we conscious Automata?" Proceedings of the Texas Academy of Science, June, 1896.

VI. THE LIVING SUBSTANCE AS SENSORI-MOTOR AGENT

THE extra-conscious, power-endowed existent, revealed as living substance in perceptual awareness, composes all vital organisms. Its structure, as evidenced in the progressive development of higher and higher forms of life, has become in the course of phyletic evolution elaborated to such an astonishing degree of complexity and efficiency, as renders these higher forms of life capable of performing all the wondrous vital functions displayed by them. This manifoldly and multifoldly individuated living substance may at all its stages of elaboration be rightly looked upon as a sensori-motor agent. It feels and it moves. It alone of all known perceptible objects is endowed, as functional outcome of its vital organization, with the faculty of self-movement, and with the property of self-feeling. The attribution to the living substance of the property of self-feeling is not an *a priori* ontological assumption. It expresses a fact of nature experientially revealed, and epistemologically justified, as shall become obvious further on.

Of all known existents the living substance alone reacts on external stimulation in self-important ways, as a unitary whole. This specifically vital reaction is accompanied by self-feeling or sentiency, whose progressive differentiation and development are an outcome of the underlying progressive organic elaboration of its vital bearer, wrought within it in relation to manifold influences of the medium, and through interaction with

the same. As result of this process of organic development, the entire surface of the organism, directly exposed, as it is, to the stimulating influences of the medium, has eventually become elaborated into sensory organs, which in response to the diverse modes of stimulation have become, especially in the cephalic or highest region, more and more specifically adapted to them. The specific modes of stimulation elicit as vital reaction or response correspondingly specific modes of sentiency: tactual, thermal, gustatory, olfactory, auditory, and visual, pleasurably or unpleasurably tinged; which specific modes of feeling serve as signs revealing the presence and characteristics of the stimulating agencies. They are all developmental modifications of the original undifferentiated self-feeling. Obviously, the specific feelings or sensations of touching, seeing, hearing, smelling, and tasting are various modes of self-feeling phyletically differentiated and rendered specific in correspondence to, and dependence upon, the differentiation and elaboration of the surface organs of sense.

It is to the living being, *as a unitary sentient whole*, that significant developmental specifications of its sentiency accrue in the process of organic elaboration; primarily initiated through differentiation and elaboration into sensory organs of the surface structure, and developed in relation to the definite stimulating influences of the medium. These sensorial modes of self-feeling yield correspondingly specific modes of information regarding the special characteristics of the stimulating influences. At first, in lower stages of organic elaboration, differentiated sensory structures convey each its separate kind of information to the living being; tactual, or auditory, or visual, and so on.

On further structural development organic combinations of the sundry sensory organs become, moreover, centrally established, yielding more complete and more complex sensorial and perceptual information regarding the external existents signalized thereby. Such combinations of diverse modes of sensorial awareness are found, in fact, embodied in what may be called synthetic structures. It is the function of these structures, as extra-conscious existents, that becomes conscious as specifically complex yet unified modes of sensorial awareness, together with their definite accompanying motor outcomes; all of which conscious manifestations are due to actions and reactions of the indiscerptible organic being. Of such synthetic structures the complex sense-combining and sense-centralizing organ of speech affords one of the most striking examples. It involves in organic intercommunication the sensorial faculties of hearing, seeing, and touching, besides other higher modes of sensori-motor activity consciously apprehended by the living being, as supreme modifications and elaborations of his sensori-motor nature.

This same originally undifferentiated and unspecified self-feeling, besides rendering organic needs consciously manifest, becomes also in the course of higher elaboration differentiated into manifold affective modes of sentiency, indicative of favorable or unfavorable effects of foreign influences on its own well-being. The perceptual awareness of a foreign existent is not solely a cognitive incident, but is also of affective and conative import. It awakens immediate pleasurable or painful feelings and emotions, and incites to appropriate modes of motor reaction in organized connection with the same. The direct original interdependence of the psychological trinity: affection, cognition, and conation,

is strikingly manifest in the behavior of animals, and there the more so where memorized experience does not consciously complicate and inhibit their immediate interaction. Of course, as regards these psychological phenomena experienced by foreign organisms, they can only be analogically inferred from perceptible signs, interpreted in accordance with the investigator's own psychical experience. This roundabout mode of information of what psychically occurs in other living beings is the only one available, and as such also the only information received regarding what is actually psychically occurring even in beings nearest to us. Inferences regarding psychical faculties possessed by organisms lower in the scale of development than ourselves may be reached by the study of comparative nerve and brain anatomy and physiology.

The motor outcomes of the functional activity of the living substance are outwardly perceptible signs of what the functioning organism is inwardly psychically experiencing. The extra-conscious activity of the extra-conscious being is felt directly by itself as a conscious or sentient state. By outsiders it is perceived as some kind of motion taking place in the perceptually revealed organism forming part of their own conscious content. We are epistemologically justified in concluding, that there is a definite activity at work in the existent perceptually revealed as the living organism, which causes through sensorial stimulation definite motor perceptions to arise in the conscious content of onlookers. In consequence of it the living substance may rightly be called a motor agent, although the real nature of the activity here at work is only indirectly known through its motor effects.

The vitality of the living substance is not a static

property. It is the outcome of a dynamical process. It is not the property of any kind of mere chemical compound. It is altogether a phyletically elaborated chemical process, taking place in strict dependence upon and interaction with the stimulating influences of the medium. The living substance, as revealed to perception, is scientifically found to be a highly complex chemical substance, whose vitality consists in a specific chemical concatenation of occurrences, involving and constituting the entire organism which it composes. "Life," a mere abstract concept, it need hardly be mentioned, is not — as often thought — a foreign entity inhabiting and actuating a mechanical organism. It is the inherent activity of that which constitutes the living substance; an activity which is manifest as its vitality, and which essentially distinguishes it from all other perceptible existents.

The stimulating influences of the environment functionally disintegrate the living substance in definite ways. But such functional disintegration is at once followed by reintegration to complete structural and functional integrity by force of affinitive combination with complementary "nutritive" material. It is this life-constituting function of specific disintegration on stimulation from without, and specific responsive reintegration from within, that governs and gives rise to all other functions of life. Functional disintegration creates the most insistent organic needs, those of hunger and sleep, psychically manifest as irresistible cravings. In order to satisfy the former almost all modes of sensibility and of motion are set going and forced into service. It would almost appear as if all functions of life existed solely for the sake of satisfying the craving of hunger. Yet the truth is, that the sustaining of the

structural identity of the organism, and its developmental elaboration in interaction with the influences of the medium, has ever been and remains throughout the most essential and significant outcome of vital activity. The seemingly all-compelling ravenous feeling of hunger, for whose satisfaction almost all other vital functions are actuated, is in verity of subordinate importance, though necessarily and most insistently implicated in the carrying on of life. It is as conscious sign wholly subservient to the self-preservation, and further development, of the organic individual, through structural reintegration, and progressive elaboration. In the same way the other all-important and insistent organic craving, that of sex, is wholly subservient to the preservation and further development of the race. In a certain sense it may be said, "*Der Hunger und die Liebe erhalten das Weltgetriebe,*" but by no means for their own appetative self-gratification. Organic needs, consciously realized as insistent cravings, are really subservient to the living being's life of outside relations organically embodied in the ectoderm. It is the functioning organs of the ectoderm, sensory and motor, with all their centrally elaborated combinations, that bring us into actual contact and relation with the outside world, in interaction with which our normal cravings find alone normal satisfaction. Through their progressive elaboration the conscious content becomes more and more an all-revealing medium, affording us more and more complete information regarding the outside world, developing thereby more and more correct and refined emotions in relation to it, which enables us to guide our social and ethical conduct of life towards higher perfection, through the instrumentality of voluntary actions.

Biologically expressed, the functions of the entodermic organs are subservient to the functions of the ectodermic organs, and nowise is the reverse the case, as virtually asserted by hedonistic philosophers and ascetic zealots. The subserviency of entodermic to ectodermic functions the present writer has positively ascertained and demonstrated in his biological researches concerning the vital functions of the living substance, and has brought this positively ascertained fact to bear against the biological views of Bichat, and the philosophical teachings of Schopenhauer,¹ who both maintain the subserviency of the life of outside relations to that of the life of intrinsic cravings, appetites, or passions, to which it is indeed all too often perverted against its normal import.

It has to be admitted that sentiency and motion, or psychical and physical phenomena of every kind, are two incommensurable modes of experience. Hence Cartesian dualism and psychophysical parallelism. How, then, can the unitary living substance possibly be a sensori-motor agent? How can it be an existent that embodies as its essential nature, and manifests as its essential functions, these two wholly discrepant attributes of intrinsic mental states and extrinsic bodily motions — attributes which Spinoza vainly sought harmoniously to unify as determinations of one and the same absolute substance? The living substance of the biologist actually embodies both attributes, being endowed with sentiency and also with motility, with psychical awareness and also with physical activity. But, although it is the bearer of such wondrous world-revealing and world-influencing efficiencies, it is infi-

¹ See "Ethics and Biology." "International Journal of Ethics," Oct. 1894. Also "Hunger." Boston, "Index," 1884.

nitely remote of being like Spinoza's absolute substance, also the one-and-all, or like Fichte's Ego the world-creating power. It is merely a peculiarly endowed individuated existent among innumerable other individuated existents, and wholly dependent from moment to moment on its interaction with the outside world surrounding it.

The ancient psychophysical riddle embodied in the living substance or living organism whose solution has been attempted in this treatise remains still a crux of philosophical and scientific interpretation. It is principally accountable for genuine philosophical dissensions. In illustration of it, it is instructive to examine the part it has recently played in the attempt to explain the nature of emotions. Here it has led William James and C. Lange to look upon these conscious states as being physically aroused by bodily commotions centripetally conveyed to the seat of consciousness and felt there as mental emotions. For, so it is argued, eliminate "all the feelings of bodily symptoms," and there would be nothing left to constitute the emotion. Into this argument or theory it is evident that the entire psychophysical riddle is implicated wholly unsolved. It is simply taken for granted that physical modes of motion have somehow power to cause psychical modes of awareness to arise, or that the physical phenomena are directly felt as psychical phenomena. Such occurrence, if it really took place, would indeed be rightly held to be an incomprehensible mystery; and as such philosophy and science have both declared it to be. A physical motion cannot rationally be conceived to cause, produce, give rise to, or influence in any direct manner the conscious state accompanying it. Of course, it is quite true that if the motor out-

comes of the emotional activity of the organism actually perceived by onlookers, or imagined by them as perceptible, were not present, neither would the psychological outcomes felt as emotion by the agitated subject be present. But the sensorially perceived bodily motions or commotions forming part of the "cool," mere "cognitive" conscious content of onlookers is nowise that which is felt as emotion, or which gives centripetally rise to emotion. For how can anything I actually perceive, or imagine as perceived by me, have direct influence on anything you are feeling? On the other hand, the felt emotion is just as little that which gives rise to the concomitant motor phenomena which I perceive, and which as such form part of my own conscious content. These two sets of phenomena; the physical forming part of the conscious content of any number of present onlookers, and the psychological phenomenon, the emotion, forming exclusively part of the conscious content of the subject who experiences it; these two utterly diverse sets of phenomena do not and cannot in the least influence one another. They are, however, both outcomes of the same vital activity. The psychological outcome, the emotion, is directly inwardly felt by the affected subject; the physical outcome, the bodily motions, are — on the contrary — indirectly and outwardly perceived by means of sense-stimulation by whatever onlooker may be present, the affected subject among the rest.

It is of paramount importance to psychology as well as to physical science, that this actual state of things should be clearly recognized. It will be well, therefore, to scrutinize it a little closer. An emotion is, of course, a different kind of psychological experience from that of a percept, for instance. The former is felt local-

ized within the organism, the latter is perceived as localized outside the organism. Yet they are both psychical states of one and the same organism; the former is affective, the latter cognitive. A pain is generally felt localized at a definite spot on or in the organism, an emotion almost anywhere within the organism. But of whatever kind a psychical experience may be, affective, cognitive, or conative, it does not directly include the awareness of bodily organs and their motions and commotions. Unless I am an anatomist and physiologist I have no knowledge of what exists under my skin, no knowledge of the existence of my bodily organs and their functions. Consequently, emotions, as actually experienced, do not involve, nor convey the least conscious awareness of, internal bodily organs and their commotions, and can nowise be directly or introspectively referred to such.

It is entirely through different means, namely, through sense-perception, that outsiders, or the affected subject himself, gets anatomically and physiologically to learn what organs exist under the skin, and what functions of them correspond to an emotion, or, indeed, to any conscious state. That which is actually perceived, or recollectively imagined, as bodily concomitants to psychical states, forms part of the onlooker's conscious content, and only symbolically signals what really takes place in the living being. It is, as already stated, the same vital activity psychically felt as emotion, which is also physically perceptible by means of sense-stimulation, as motion or commotion. But the emotion, as a conscious state, does not give rise to the perceived commotion, nor does the perceptible commotion give rise to the emotion as inwardly felt.

To declare that it is the commotion of bodily organs that centripetally propagated to the brain causes the emotion to arise, implies: either that bodily functions as physiologically known have power to produce the psychical state called emotion, or that the centrally propagated bodily stir elicits in some mysterious way the emotion from a psychical medium or entity which exists apart from the organic being, incomprehensibly bound up with it, and manifesting modes of awareness strictly corresponding to definite bodily modes of commotion. James rightly aims at basing psychological occurrences on biological foundations, or at least at disclosing their interdependence. In this experiential endeavor he finds himself, however, foiled for lack of a scientifically and rationally justified epistemology. He finds himself compelled, much in Descartes's dualistic way, to assume a psychical medium somehow subsisting but not organically incorporated in the living being; a medium existing independently of it, receiving telegraphic messages through the senses, that travel along the nerves, and on reaching the brain are somehow conveyed to the psychical sphere, and interpreted there in its own psychical terms. In this view the bodily commotions are mere signals apprehended and translated into modes of conscious awareness in a super-organic region, and the organism itself plays the part of a mere mechanical contrivance, wholly unaware of the message it receives and conveys. One of the puzzles here is, how the organism with its motions, as a mere mechanical contrivance, can be itself consciously known, for consciously known are only the psychical messages, and the bodily signals are here nowise themselves psychical messages, and can, therefore, not be known to exist. The same applies to the organism as

a whole, when thus conceived as a telegraphic apparatus.

Howsoever ingeniously guarded, such dualistic views lead to inextricable confusion, starting no end of insolvable problems, impeding the course of a true interpretation of natural phenomena. Among these fictitious problems involved in the psychophysical riddle one of the foremost and most momentous is the nature of volitional actuation, conceived as a psychical activity giving rise to voluntary movements. It is utterly incomprehensible how volition, as a psychical occurrence, can possibly cause a purposive movement to take place, or how any other kind of vital activity can be influenced by any conscious state. The incomprehensibility of interaction or intercommunication between psychical and physical occurrences has indeed been conceded by philosophical and by scientific thinkers.

Readers who have given attention to the epistemological solution of the psychophysical riddle offered in this treatise, and also in a number of previous publications, and as having just been applied to the nature of emotions, will understand in what sense the living substance may be rightly regarded as a sensori-motor agent. The reiteration, at this juncture, of the solution of the psychophysical riddle, which may be thought rather tedious, would be omitted, if its fundamental importance to philosophy and science, urged for the last twenty-five years, had been recognized, or its alleged validity refuted. As it stands, the only hope of its gaining attention is to show again, how its application to philosophical and scientific problems clears up obscurities and mysteries involved in current interpretations. To be sure, it plays sad havoc with idealistic

as well as with materialistic systems. But it is by no means far-fetched, and is capable of being positively demonstrated as based on obviously given facts of experience. In the instance here under special consideration, the task is to show how what is perceived as the living substance can be a psychical and also a physical agent, combining in itself inseparably and harmoniously the two seemingly incompatible attributes of mind and body.

Once more then: it having been epistemologically shown that the philosophical investigator is justified in assuming the real existence of a plurality of living beings like himself, carrying on their life independently of his casually perceiving them; it cannot be denied that the motor or physical outcomes of the vital activity of the living substance composing the organism of an observed subject, are the outsider's or onlooker's aspect and conscious awareness of the activity taking place within this observed subject. The concomitant and strictly corresponding psychical outcome of this activity is, on the other hand, the observed subject's own experienced conscious awareness of it, as an occurrence taking place exclusively and directly within himself, wholly unshared by onlookers. What conduces here to rather complicate this otherwise simple and obvious extrication from the psychophysical entanglement is introduced by the additional fact that the observed subject who exclusively experiences the direct psychical phenomena as outcomes of certain vital activities within his own being; that this subject shares, moreover, with outsiders the perceptual awareness of the motor or physical aspect of this activity. For his senses are affected by it in exactly the same roundabout stimulated way as those of any other onlooker. And

as the motor or physical phenomena perceived by onlookers certainly form part of their own conscious content, and can therefore not possibly have any influence on what takes place within the observed subject, the same must obviously obtain with regard to this subject's own perceptual awareness of the motor or physical outcomes of his vital activity.

Evidently the perceived motor or physical outcomes, arising within the conscious content of onlookers on sense stimulation, can only symbolically and inadequately reveal and represent in terms of perceptual awareness the real nature of the vital substance and its activities. For such awareness consists of nothing but visual and tactual sensations and perceptions which are as forceless and evanescent as all other constituents of the conscious content. The truth is, both sets of phenomena, the psychical and the physical, as actually experienced, are alike conscious states, and therefore essentially of the same nature. Only they occur in different subjects, or independently of each other in the same subject. They are different outcomes of the same vital activity. Certain vital activities of the living substance or organism are sentient to itself only, but are also perceptible as motor or physical outcomes to outsiders. A so-called mind-reader, who is really a motion-reader, is such an outside percipient. He reads the motor outcomes of the same vital activity, which is experienced as a psychical occurrence by the subject whose mind he is supposed to be reading, while he is really aware only of tactual sensations indicative of the motor outcomes of the subject's vital activity. His own tactual sensations correspond, through the mediation of the motor phenomena, to the mental states of the sensori-motor subject he is in contact with.

When a physiologist calls certain nerves "sensory nerves," and other nerves "motor nerves;" also certain regions and pathways in the brain "sensorial," and others "motor," — he directly infers the motor character of the latter to be actually perceptible. As regards the sensorial character of the former, he only indirectly infers them to be bearers of sentiency, and to be of psychical import to the subject he is observing. This he concludes solely through analogy to his own sentient experience. Motions are perceptible, sensations are imperceptible to outsiders. When pinching a nerve which he perceives as belonging to an observed subject, the observer sees this subject flinch or hears him scream, he analogically concludes that the subject has consciously experienced pain, and calls on this account the nerve a "sensory nerve." He can experiment in a similar way upon himself, and ascertains then directly by means of his own sensation, that the hurt to what is outwardly and perceptually revealed to him as a certain nerve is followed by the definite sensation he inwardly feels. But it is not the perceptual nerve forming part of his conscious content that causes or has anything to do with the pain. It only signalizes to him the real, extra-conscious existent directly instrumental in causing the pain.

Forming part of his own conscious content the physiologist perceives as signs of vital activities occurring in an observed subject nothing but modes of motion, or he legitimately infers the existence of such motions in organs he has previously examined, and which he is now consciously aware of as memorized and imagined. In this way certain motions in perceptible sensory organs are imagined as being propagated along so-called sensory nerves to central organs, and then de-

scending, modified thereby, along motor nerves, to end in perceptible muscles, whose contractile function as final outcome of the unbroken series of motions is then actually perceived by the observer, and recognized as purposive, instinctive, or reflex action. There is here nowhere room for the intercalation of any mode of sentiency between the different modes of motion astrir within the neural organs that constitute the continuous motor track from beginning to end. As perceptually revealed, all neural organs are exclusively motor.

It is here that the psychophysical riddle offers itself directly for solution in its most obvious form. To the physiologist there is nothing actually present but modes of motion occurring in certain organic structures. How, then, can a mere vibration or tremor of neural particles give rise to the conscious state concomitantly experienced? How can a definite neural commotion produce within the neural structure any mode of consciousness, any thought, sensation, emotion, perception — the perception, for example, of an entire landscape, or of a certain visitor? The psychophysical problem thus formulated is undoubtably insolvable. To explain it, it is sometimes asserted that the neural commotion, as a mode of energy, becomes converted into its corresponding conscious state, as another mode of energy. But this is not only incomprehensible; it is quite impossible. For the neural commotion is in fact propagated along the entire neural track. If it were anywhere in its course converted into a conscious state, there would be no further motor outcome. The telegraphic interpretation, on the other hand, assumes the organism to be a mechanical contrivance receiving messages in motor signs, and conveying the same to a psychical medium, where they are psychically translated and

understood. This mode of interpretation, popularly and theologically current, is doubly incomprehensible. For it is avowedly incomprehensible, how mere neural motor taps can be received and consciously interpreted by an extra-organic wholly incommensurable psychical agent. And this incomprehensibility is doubled when it is asked, how the incommensurable psychical agent is able, moreover, to start from its extra-organic habitation the motor activity which executes intelligent purposive movements at the other end of the telegraphic apparatus? This profound psychophysical puzzle gives rise to time-sanctioned superstitions, which exert a vast influence on human aspirations by giving them a wrong and unprofitable direction.

There remain some other attempts to solve the psychophysical riddle. Of these the conscious-automaton theory, involved in Descartes's mechanical interpretation of vital phenomena, has since been adopted by prominent thinkers, and is virtually or avowedly the leading theory of most biologists up to the present day. In this view psychical awareness is believed to have no influence whatever upon life and its vital activities, but to be a mere epiphenomenon ineffectively accompanying the mechanical functions of a material automaton, which functions are set going by the combustion of externally supplied fuel. In this theory all that perceptibly occurs in life is mechanically necessitated, and conscious awareness is consequently an entirely superfluous addendum.

On the other hand, the recognition that all we are directly aware of consists of nothing but conscious states or modes of awareness, has led a number of philosophers, and lately also a number of scientists, to adopt pure idealism as their scientific creed. Such pure ideal-

ism yields, however, no rational system of knowledge without the introduction of manifold extra-conscious or non-ideal agencies, of which, as indispensably implicated, latent memorized experience is the most important.

To avoid endless wrangling concerning the psychophysical nature of our experience, many scientific thinkers, candidly acknowledging it a problem as yet unsolved, have adopted as a provisional hypothesis that of psychophysical parallelism.

Sensations and other modes of awareness being clearly mere forceless, transient phenomena, psychical science must necessarily fail in its attempt to construct the world out of such flimsy evanescent stuff. And motion being itself one of these forceless modes of awareness, physical science wrongly attributes to it forceful, all-efficient actuation. Rightly and legitimately it can consider modes of motion to be only signals that perceptually reveal efficient activities that are at work in the realm of extra-conscious existence. Perceptible bodies, generally regarded as material existents, are as actually perceived made up of nothing but the percipient's own transient modes of awareness. This truth is incontestable. But it is legitimate to infer from manifold data, that the perceptual modes of awareness signalize real extra-conscious entities endowed with all the efficiencies that become manifest in the multifold modes of cognitive awareness.

What is perceptually revealed as the living substance or living organism is in reality such an extra-conscious, relatively permanent entity subsisting in interaction with other perceptible, extra-conscious existents. Although as consciously perceived, whenever and wherever onlookers may become aware of it,

it consists then only of a complex of transient perceptual phenomena. The scientific investigator who perceives as forming part of his own conscious content the organism and its functions, and who by means of laborious research has come to learn its perceptible anatomical constitution and its physiological functions; a knowledge latently harbored, as remembered experience of his own individual self, within the extra-conscious matrix whence his accumulated experience issues into actual awareness; this scientific investigator, so richly informed of all that is perceptible regarding the organism he has examined, remains thereby wholly uninformed in any direct manner of what is psychically experienced by it. And as nothing psychically occurring within the observed subject is itself perceptible, it is certain, therefore, that that which is perceptible as the organic being does not consist of anything known as psychical, not of the ephemeral mindstuff of which dreams, visions, and indeed all actual awareness are made of. The organic being is obviously a non-mental, power-endowed existent which is only symbolically revealed in perceptual awareness; an existent found to have been, body and mind, toilsomely elaborated into enduring organic consistency during phyletic development; an existent endowed with significant modes of action and reaction gradually acquired in interaction with the medium; an existent endowed above all with the power of preserving its identity amid constant change, and which on account of it has to be regarded as the only genuine substantial being known. Its vital interaction with the medium with its twofold outcomes, the psychical outcome directly informing the organism itself of its relations to the environment; the physical outcome informing onlookers in a roundabout

way of its presence, space-occupancy, and motor activity; this twofold outcome of vital activity on the part of the living substance entitles it to be regarded as a sensori-motor agent.

Although the perceptual revelation of the living organism, which arises in the conscious content of the biologist, only symbolically represents in terms of visual and tactual awareness its presence and characteristics, and although this perceptual awareness has no efficient influence whatever on the real existent and its activities so vividly and minutely represented thereby; yet all scientific knowledge regarding what is perceptible as the organism and its functions is gained in this roundabout way of sense-stimulation and vicarious representation. Mere introspective exploration of memorized experience randomly accrued in the common course of life, and through its modes of physical and social struggle and satisfaction, has proved eminently bewildering and insufficient to yield anything like true knowledge regarding the real nature of our own being and the world at large. The many deep-rooted superstitions, engendered in the attempt to merely guess at the real conditions under which human life is carried on, and prevailing as beliefs in its guidance ages upon ages previous to the scientific era, had one by one to be overcome against strenuous resistance by direct and systematic scientific investigation of real facts of nature experientially given. This is indeed the only way by which true knowledge can be attained. The dialectic juggling with mental concepts still resorted to; concepts believed to be self-sustained and self-acting entities, cannot possibly evolve any kind of knowledge not previously experientially gathered and individually memorized, and especially no knowledge concerning what

is solely perceptually revealed through sensorial experience. It is somewhat strange that conceptualists persist in denying the indispensable primary part sensorial experience is playing in the formation of all manner of concepts, when the actual proof is being undeniably afforded by persons congenitally deficient in sense-perception. Nay, language itself is clearly sense-derived and sensorially apprehended. And without language it is admitted that there can be no concepts, and consequently no conceptual thinking. To conceptual thinking, at the very least, tactual linguistic signs are indispensable. For scientifically untrained philosophical minds conceptual juggling is, however, a supreme delight. In illustration of it read the inept conceptual emanations of many Young-Hegelians, or the master's own conceptual deductions of clerically established theological dogmas and existing state institutions.

Within the direct, scientifically uninformed awareness of his own conscious content the living being has not the remotest inkling of the minute anatomical structures and complex physiological functions that underlie the appearance of this his conscious content with all its variously significant distinctions, no inkling of what issues it into actual awareness, and sustains it there. Solely, then, through close attentive investigation of what is revealed in perceptual awareness regarding the organism and its functions can be gained an understanding, how the living substance or organism comes to be alive, by what means it has structurally and functionally developed so as to stand in definite, manifold interactive relations to its medium, and which of its structures and functions are concerned in the harboring and issuing of its conscious content, in the

acquisition of its accumulating and latently preserved experience, and in its conduct of life through guidance of such gathered experience. Of all this information *a priori* conceptual deduction can know absolutely nothing.

Innate, inherited, and organically constituted potential molds of what Kant calls conceptual categories certainly exist before any experiential influx is cast into them. The same obtains with regard to perceptual molds, respectively organized in the sphere of the various organs of sense of the sensori-motor individual. Whoever is conversant with what has been scientifically ascertained regarding the minute, wondrously complex structure of the brain as perceptually revealed, cannot but deem it unconscionable to imagine that psychical modes may just as well, or even better, arise into awareness freed from the incumbrance of all these organized structures and their vital activities. How completely dependent on vital organization and vital function so-called conceptual categories actually are, becomes evident, for example, when the nature of the category of substantiality is scientifically investigated. It was found that the permanency and identity maintained amid change by the substance which constitutes the living organism, and which manifests its all-revealing conscious content; it was positively found that this enduringly sustained identity wholly depends upon, and is solely rendered possible, by the living substance being continually restored to identical integrity through reintegration, after suffering disintegration during its interaction with the influences of the medium. Hence nutritive assimilation, hunger, and sleep. It is this organically vital process which alone constitutes the substantiality of the living substance, and enables

the fleeting phenomena of the conscious content to reflect, with rainbowlike phenomenal repose, the identically abiding nature of the extra-conscious existents they symbolically signalize.

As to causation, the other most important of Kant's categories, wrongly declared by Schopenhauer to be the only important one, it is obvious that the reference of an effect or occurrence to an antecedent cause presupposes the organically connected memory of the previous conscious experience, and this memory of something past can be harbored only in the organic matrix of the conscious content. Vital organization and its activities, symbolically revealed to perception, underlie all conscious awareness.

The knowledge of the sensori-motor individual is acquired by means of his organized faculties potentially predisposing him to attain it through actual experience. These faculties have been unconsciously organized within his extra-conscious being during phyletic elaboration, and are also unconsciously reproduced in the individual during his embryonic evolution. They have been thus organized through constant vital interaction with, and in relation to, the influences of the medium; which same influences are in future again to affect the organic sensibilities of newly born offspring, and to arouse in them definite organized responses and significant reactions, whose conscious awareness constitutes by means of reiterated experience, and pre-eminently by means of scientific results, the growing knowledge of themselves and of the world at large. Conscious awareness aroused through external or internal incitement, conveying information to the living being, which he receives, feels, and apprehends as a complex of actual and memorized modes of his self-feeling, is

that which constitutes him a sensory or psychical agent. The active, attentive, apperceptive, recognitive reaction upon and in relation to such sensory or psychical information, is that which constitutes him a motor agent. This motor activity is exercised not only in actuation of outwardly perceptible reactive movements. But where in higher forms of life a fund of memorized conscious experience has been gathered by the individual, it is exercised also in the habitual or premeditated choice of definite modes of motor actuation in relation to the accumulated fund of memorized experience, which is here in representative signs simultaneously presented for choice to actual awareness, and is serving as guidance among many possible ways in the following of the chosen path. All motor activity is perceptible to outsiders, and forms as modes of perceptual motion their sense-stimulated awareness of it. All psychical outcome of the vital activity is, on the contrary, imperceptible to them. Both outcomes of vital activity primarily and during the entire course of phyletic development, emanate from one and the same living being, and constitute him a sensori-motor and ideo-motor agent.

VII. SENTIENCY AND PURPOSIVE MOVEMENTS¹

IN watching living beings of whatever kind, be they plants or animals, be they protophyta or angiosperms, protozoa or vertebrates, the purposiveness of their movements in relation to their medium cannot be mistaken. Life at all its stages is fundamentally conditioned by interaction with the medium. The spring of all vitality, that which sets it going and keeps it quickened, is functional interaction with existential conditions afforded by the environment. The living substance has always stood in three different direct and vital modes of necessary dependence upon its given medium. First upon the stimulating influences which specifically incite the sensorial functions; second, upon the nutritive supply which furnishes the complemental material for reintegration following functional disintegration; and third, upon the supply of atmospheric oxygen necessitated by the depurative process leading to the elimination of waste products. These vitally indispensable modes of interdependence and interaction presuppose an intimately preëstablished harmony between every function of the organism and the conditioning and actuating factors of the medium. It is useless to seek for the origin of life where these interdependent processes between the living substance and its medium are not operative, for they are themselves that which constitutes life.

¹ Read before the Texas Academy of Science, June, 1902.

The sense-stimulating and sense-stimulated interaction takes place at the organism's surface of contact with the medium. The stimulating influences impinge upon it, and disintegrate more or less deeply the living substance, whence the disintegration thus started spreads inwardly, and would eventually cause the entire substance of the living being to deteriorate and waste away, unless met and arrested by adequate reintegration from within. The peculiar susceptibility of the living substance to being thus affected and functionally disintegrated by external stimulation, and its ability thereupon to regain full integrity and identity of constitution; this unique interplay of functional reintegration following functional disintegration, is that which essentially constitutes its vitality, and which involves in its train all other vital functions. By force of it the living substance — as explained in a former section — comes to be the only genuine substantial existent in nature. For it alone maintains its identity though continually undergoing changes. It is, in fact, a veritable vortex of change amid which it rescues its identity by constant reintegration. Here Bichat's definition of life receives its true significance. "*La vie est l'ensemble des fonctions qui résistees a la mort.*"

It is important to emphasize in this connection, that the living substance, as *conditio sine qua non* of being alive, is constitutionally, and from the very beginning out and out adapted to its medium. Adaptation to the medium is coeval with life itself. It is not additionally brought about in any roundabout way. It is structurally and functionally molded from the very start through direct interaction with the medium at the surface of contact with it, and involves in consequence the entire organism, because all its parts, structures,

and functions are interdependently connected. Surface or ectodermic structures and functions are of necessity adapted to the stimulating influences whose disintegrating tendencies they have to counteract, as essential condition of their existence and maintenance.

The most conspicuous auxiliary function of vital activity is that of appropriating nutritive material, by means of which the living substance is enabled to reintegrate itself when functionally disintegrated. The continuance of life is obviously wholly dependent on the supply of "nutritive" material. Consequently, this mode of adaptive dependence of the organism upon its definitely given medium must be also coeval with life. Life, as something that can exist apart from it, is biologically unthinkable. Hence the superlatively insistent part need of nutrition is playing in animal life, turning our world into a vast arena of preying and being preyed upon.

The imperative need of atmospheric oxygen proves to be another most urgent mode of dependence upon the medium, which is likewise coeval with life, and necessitated to prevent asphyxiation by oxydizing and rendering thereby eliminable the waste products of functional disintegration. Breathing, whose function is to exhale oxydized waste products and to inhale new oxygen, is manifestly so essential to life that *ψυχή*, *πνεῦμα*, *āνεμος*, *anima*, all terms signifying "breath," conceived as an entity capable of infusing into inanimate matter "the breath of life," has been for many centuries believed to be itself the veritable principle of life. And certainly life without breathing, and consequently without supply of oxygen, cannot possibly exist. To believe otherwise is altogether fanciful.

In these three fundamental and essential ways, then,

is the life of the organism imperatively dependent upon, and therewith constitutionally adapted to its medium. Progressive organization of living beings during phyletic development, manifest as elaboration of these three fundamental modes of vital interaction with the medium, represents perceptibly more and more complex and efficient structural and functional adaptation to the manifold ways in which the external influences have power to directly affect the individual's wellbeing, and indirectly that of the race. Considering how in consequence of the interaction of the organism with its medium a gradual complex attunement of its sundry surface regions to sundry specific modes of stimulation has been actually attained; an attunement which draws with it the formation of specific sensory organs, an adjustment of the entire sensori-motor organization of the ectodermic structures, and draws with it, furthermore, corresponding organization of the organs that have to supply it with specifically elaborated restitutive material, and also corresponding organization of the organs that have to eliminate the waste materials of disintegration; considering these obvious facts, the conclusion lies near that the organism as a whole is adaptively plastic to the influences of the medium. Some of these influences affect fundamentally all organisms alike, such as surface stimulation, supply of nutritive material, and supply of oxygen. There are, however, many other special influences and conditions of the medium amid which organisms had from generation to generation to carry on their life, and to which they have become specially adapted through modifications of structure and shape.

In order to gain an understanding of the correlative modifications of structure and function, which fit an

organism in all its parts to life in a special medium, it has to be remembered that the entire living substance constituting an organism is from the very start correlative^{ly} organized as a unitary existent, all parts of which are organically and functionally interdependent. And although the organism possesses the power to maintain amid constant change its essential identity with astonishing exactitude and persistency, it is nevertheless subject to modifications wrought from within, and also to modifications forced upon it from without. The most striking evidence of adaptive plasticity is afforded by paleontological research, especially by examples of analogical adaptation of different classes of animals to life in the same special medium. Such analogous adaptation is most obviously displayed in aquatic and flying animals. Among aquatic vertebrates are found fishes, reptiles, and mammals, whose respective general shape and organs of locomotion are astonishingly similar in appearance. Among flying animals a number of widely different kinds are adapted to their special medium. All this testifies to the adaptive plasticity of the organism in relation to the medium in which it has to carry on its life.

The question here arising is the much vexed question regarding the means through which adaptation of the organism to its medium is brought about. It has been shown that the fundamental modes of adaptation are coeval with life, and that they determine the general organic constitution of the living substance. They are wholly dependent on direct, indispensable interaction with the medium, and cannot possibly be the result of any kind of selection among preëxisting forms of life. Further adaptation to a special medium,

terrestrial, subterrestrial, aquatic, and aerial, is wrought through modifications of the three primordial modes of adaptation, simultaneously with other modes of adaptive modification, always in persistent vital interaction with the special medium in relation to which the special modification is taking place. Adaptation of sensory, nutritive, and respiratory organs and their function accompany all along modification of the general shape of the organism and those of its locomotive apparatus. The organism being a unitary whole, whose functions are all interdependently connected, modification of any of its essential parts involves modification of its entire structure.

Adaptation to a changing environment, or adaptation to more minutely specific influences of the medium, such as that undergone by the organs of sense, are wrought upon the form, structures, and functions previously adapted to life in the former medium. But all special adaptations are wrought upon the fundamental modes of adaptation that are coeval with primitive life, and they are acquisitions of the indiscerptible organic being, inwrought into its original constitution, not pieced on to it through additional aggregation of elementary units.

As to the general shape of primitive animals, the primordial result of interaction of their living substance with the medium is the assumption of a bipolar and bilateral form, as explained by the present writer in his biological papers. The determining influence of the medium in the fundamental shaping of the organic form is directly observable. Starting, then, from this originally given state of things; an oral and an aboral pole of the bilateral, as yet morphologically unorganized, living substance, the first essential task

is to ascertain in what manner and by what means the differentiating, specializing, and developing elaboration of the surface of contact of the organism with its medium has been brought about. The primitive amœboid being, through and through chemically fluent, attains in the course of development a stable surface structure, while the interior substance remains still fluent, as seen in infusoria. Such surface equilibration is brought about essentially by adequate reintegration restoring at once on the spot the chemical gap caused by functional disintegration in interaction with the stimulating influences of the medium. Slight unfavorable conditions are seen to upset this surface-equilibration. Organizing structural elaboration works its way from the surface inward, involving ultimately the entire substance of the body, differentiating and specializing it into distinct organs, all ministering to progressive modes of interaction of the organism with its environment. In the ectoderm of higher forms of life it is found to have resulted in the formation of sensory organs specifically and diversely adapted or attuned to diverse specific stimulating influences, and conveying thereby whatever direct information the animal has of the perceptible world. Through what process, then, has so marvelously a fitting of organic conditions to external conditions been attained?

It is now generally believed that useful chance-variations arising at the sensory surface, unaided by direct coöperation of the stimulating influences to which the sensory organs have eventually become specifically adapted, that such useful chance-variations are in the struggle for existence preserved and transmitted to offspring. Through gradual accumulation

of such preserved useful variations the attuned sensory organ is held to have been at last more or less perfectly organized as at present found. This interpretation, though entirely at variance with fundamental biological principles, has been strenuously advocated. The recognition of the gradual organic development of living beings from lowest beginnings to ever higher stages in the scale of life ranks rightly as one of the foremost, if not the very foremost, acquisition of scientific knowledge. No biologist at present doubts that the organism with its developed sensory organs has most gradually attained its present state of organization and adaptation. The question is, by what means?

Surely, it is unconscionable that slight useful chance-variations, cumulatively selected during ever so long a period could have resulted, for instance, in our present organ of vision, with all its centrally organized belongings, in which the entire universe with all perceptible things stands vividly revealed. It goes against rational thought and instinct to credit such a stupendous world-revealing outcome to the mere heaping up of chance occurrences. In this current interpretation of progressive organization through natural selection of chance-varieties, the fundamental biological principle left out of sight is the evident and often acknowledged one that function determines structure. Structure is stable only in morphological appearance, and quite especially so in the cooked preparations generally used for morphological investigation. Morphological appearance is, however, a functional outcome or perceptible result of definite vital activity. Functional inactivity is followed by structural atrophy; and complete cessation of vital

activity is followed by complete structural disorganization and cessation of life. Obviously the living substance becomes progressively organized through functional interaction with the medium, and it is specialized function that gives rise to organic differentiation. Specializing function has differentiated, for instance, neural protoplasm from muscular protoplasm, and their respective morphological appearance is functionally maintained and not mechanistically stable. Within the sheath protecting and isolating the specialized protoplasm of nerve and muscle, the living substance itself is in constant functional flux, and receives its intimate morphological constitution from its specialized function. Whoever has carefully watched under the microscope living muscle in functional activity, and also the morphological disorder following arrest of normal function,¹ cannot fail to become convinced that the morphological appearance of the living protoplasm of muscular fibers is functionally established and maintained. It is vitally fluent substance, and nowise stable machinery. *The physiological function of living structure is essentially only a definitely heightened outcome of the same vital activity by which it is constituted.*

It is function, then, and not primarily structure to which specialization and adaptation are really due. What would the morphologically specialized appearance of an adapted sensory organ signify to the organism if no adapted function were underlying it; if it were not the perceptible potential bearer of the specific sensorial function which alone can serve the organism as guiding information specifically adapted to conditions of the medium? Surely it is pertinent to ask,

¹ See "Fur Lehre von der Mushellontraction" (Pflueger's Archiv, 1887)

what function of the sensory organ is really of use to the organism. 'What is it that has here at the surface of contact of the organism with the outside world become specifically and significantly adapted to external conditions? Quite obviously not the mere morphological appearance of the organic structure, nor the mere sensory and neural commotion mechanically caused by the impact of the stimulus. Under such an interpretation the morphological appearance of organic structure remains utterly enigmatic. It is clearly, above all, the sensorial outcome, the psychical response on the part of the self-feeling organism that is here of essential importance. It is the sensorial feeling of the organic being that has become aimfully and significantly specialized and adapted in relation to the influences of the medium; and what is perceived as structure and its functional motion is the anatomist's and physiologist's outside perceptual view of what has been extra-consciously established in the observed subject.

Physiologists, if determined — as some have lately declared to be — to adhere strictly only to what is perceptually revealed, debar themselves therewith from the right to take any notice whatever of psychical phenomena, and from using psychical terms in the interpretation and expression of biological facts. In this predicament there can exist for them no "organs of sense," but only certain morphological structures whose functions are exclusively mere modes of motion. These investigators are no longer justified in looking upon the eye as an organ of vision, or upon the ear as an organ of hearing. To them all vital functions are solely modes of motion, and their science, reduced thereby to pure applied mechanics, aims as its final

achievement at a mathematical expression of interdependent modes of motion displayed by morphological mechanisms. Such, indeed, is at present the avowed scientific creed of most biologists, emphatically professed on a recent occasion by almost all of the assembled representative scientists. Yet it would seem evident that they mistake thereby the fundamental nature of vital processes. For the activity of the living substance composing all organisms emanates from an intrinsically elaborated and phyletically cumulated potency, essentially non-mechanical in both its manifest outcomes; in its direct psychical outcome within the acting organism, and in its indirect outcome perceptible as modes of motion to outsiders. Vital motions resulting in purposive movements adapted to a complex and changing medium cannot be mechanically explained.

Here again we find that we cannot escape the psychophysical riddle, if we desire to gain a more profound insight into organic life than is afforded by mere perceptual appearances within the conscious content of the investigator, eminently instructive as these are in various ways. We have, moreover, to discover what these appearances really signify to the perceptible and conscious subject to which they refer. In this light the real significance of what are perceived as organs of sense is their sensorial or psychical function in relation to the stimulating influence of the medium. For no other reason are they called "organs of sense" by physiologists.

Taking, then, a comprehensive view of sense stimulation, it is found to be a far more recondite process than its mechanical interpretation of impact and imparted motion would lead us to suspect. When I tactu-

ally feel what is called "air," this is undoubtedly a definite sensation arising within my conscious content. I rightly attribute it to a definite stimulating influence. When I, furthermore, physically discover the fact that a certain number of air-tremors or waves in a second which reach my auditory organ causes to arise in my conscious content the specific sensation of a definite sound, I find myself doubly entangled in the meshes of the psychophysical riddle. For in probing what is really meant by air waves, generally believed to be the agents stimulating the auditory organ, and eliciting thereby in some incomprehensible manner the sensation of sound, I am forced to conclude that I am merely naming in terms of visual sensibility the same inferred stimulating influence, that, besides visual sensations, also arouses tactual and auditory sensations; for waves are obviously visual phenomena, and cannot as such be stimulating agents. The real efficient agent that possesses the power of arousing in me through affection of my different senses or sensibilities such specifically different sensations; this extra-conscious agent, endowed with definite powers remains unknown as such, revealed only in the sundry sensorial effects it arouses.

When the attempt is made to neglect in the process of stimulation the psychical effects, and to interpret it in purely mechanical terms, then, though ignored by mechanistic thinkers, the psychophysical riddle inevitably intrudes between themselves and their object of investigation. For -- adhering to the same example -- the air and its motion which the mechanistic thinkers take to be the real agents that stimulate what they perceive as the auditory organ, are certainly as such only forceless, transient perceptual appearances within their own conscious content, due to definite stimulation of

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their own senses. In contemplating the shadow they overlook the real substance by which it is cast. On the strength of these undeniable facts it may be concluded that, as the nature of the stimulating influences becomes only symbolically revealed through the psychical effects they arouse in the organism, these influences must be extra-conscious potencies endowed with specific powers capable of affecting the living being in definite ways, through which their presence and characteristics become revealed to himself as specific modes of functionally aroused self-feeling or awareness, and revealed also to outside investigators as definite modes of motion imparted to definite structures. The all-revealing compass of the conscious content is itself made up of forceless, transient phenomena in constant flux. It is, consequently, in the realm of extra-conscious existence and efficiency that real existents have power to affect one another in definite ways, which affections in the sensory sphere of the living being become consciously manifest.

The sensorial effects are found strictly to correspond to the stimulating influences, and to have significance only in relation to them. This essential fact seems to indicate that these efficient influences, whose intimate nature remains unknown, have had all along power to cause the living substance to be organically molded, and functionally attuned or adapted to life in the medium, whose existence and characteristics are made known through the stimulated sensorial outcomes. Sensory structures and their functions, found matured at birth in certain animals, attain in others their maturity under the direct influence of definite stimuli. And it has been ascertained that the visual centers of prematurely born infants mature more rapidly under the

direct stimulus of light than they would have matured inside the womb. In plant life the direct dependence of definite development upon definite stimulating influences is still more obvious.

As perceptually revealed to investigators, the structure-elaborating efficiency of the stimulating influences can to a certain extent be recognized; especially in relation to the definite stimulating influence visually manifest as "light" when at work on the living substance of plants. Here definite functional disintegration through the impact of "light" affords the stimulus whereupon, during reintegration from within, the protoplasm attains by means of affinitive substitution a somewhat higher composition. In the laboratory higher organic compounds are likewise elaborated on this plan of gradual affinitive substitution, whereby higher constituted complemental molecules take the place of less complex ones. Under this aspect it is rendered somewhat intelligible how through such gradual elaboration a definitive reactive response on the part of the living substance has become organically attuned to a definite mode of stimulation. Of course, it remains wholly enigmatic by what specific potency chemical compounds are enabled by assimilation into their intimate constitution to form higher and higher unitary combinations, with new and higher modes of action and reaction in relation to the influences surrounding and affecting them. We come here face to face with the same creative mystery obtaining with regard to all, even the most simple, modes of combination and interaction. The intimate nature of being and becoming; of primordial world-stuff and its progressive elaboration into definite interacting existents; of perceptible nature at any present moment and its further development in the future; all this actual

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existence with its creative activities seems in essence to be impenetrable to human understanding.

It would be passing strange if the culminating achievement of progressive development, the wondrously, complexly correlated organization of living beings, adapted through and through down to its minutest structures to modes of life in a definite medium; if it had really resulted from selection among an endless series of chance-variations, that brought with them at uncertain times an infinitesimal advantage in the same useful direction in relation to the primordially specific and eventually minutely specified influences of the medium. Into interaction with this medium the individual is born in utter dependence upon it. Yet its influences all along, from moment to moment, indispensable to life during its entire phyletic career, are held to exercise no active formative stress upon its development, which essentially consists in becoming progressively attuned to them. It is true, biologists often attribute formative efficiency to specific kinds of nutriment. Nutriment plays, however, but a subordinate part in organic development, being principally subservient to the integrative needs of the ectodermic organs, where progressive elaboration of the living substance really starts.

It shall not be denied that natural selection tends to preserve individuals best equipped for the struggle for existence, and to weed out those not so well equipped. But the adaptation itself, of which the entire organization is out and out a visible expression, is surely constitutionally wrought by means of incessant interaction with influences endowed with specific powers efficient to work specific changes, that with necessity result in a more and more ample and perfectly adapted

organization of the living substance or organism for its life in the medium with which it has been phyletically in constant interaction, and in which interaction its life essentially consists. Of course, the more complexly a species of living beings is organized, the more scope is there given for individual varieties, or for mutations forecast in the constitution of the reproductive germ, which in its minute compass harbors potentially and prospectively the multifold characteristics inherited by the organism to be developed therefrom. Scope for varieties is also given through the sexual blending of two separately and somewhat differently organized germs. But no essential deviation from the out and out phyletically adapted type takes place within normal limits, for otherwise the all but rigorous organic equilibrium which secures faithful reproduction of the kind would be profoundly upset, and development of monstrosities would be the general result.

The living substance may, then, with sufficient reason be deemed plastic to the influences of the medium affecting it in the form of certain perceptible existents, and of certain modes of radiant energy. And the progressive elaboration of its organization may be held to result principally from its interaction with the sense-stimulating influences.

The vital phenomena hitherto noticed have been mostly of the perceptible kind. They compose the biologist's vast field of direct research, and are revealed to him in terms of his own perceptual awareness. But what about the investigated being himself? What active part does he play in the progressive structural elaboration of his living substance carried on in relation to the environment? As function determines structure, the use of an organ maintaining it, and its disuse

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leading to deterioration, it is clear that structures whose functions have to await direct or indirect initiative actuation on the part of the individual, and those in higher organism that are directly dependent on volitional actuation; it is clear that the efficiency of such structures is maintained by the use of them. Moreover, a greater than normal call for the use of an organ gives rise to its greater structural development, as most strikingly evidenced in the muscular development of athletes. That such volitional actuation determines the elaboration of structure is also positively proved by intentionally executed actions becoming through frequent performance automatic. This evidently indicates that definite structural modifications have been wrought, which not only facilitate future conscious actuation, but which furthermore become on stimulation unconsciously self-acting. Our entire bodily and mental education is rendered possible by such volitional elaboration of structure retaining definitely imposed modes of modification, and functioning thereupon automatically. On normal and abnormal stimulation structures fixedly established exercise their function automatically, without being consciously actuated. This is strikingly the case, normally in dreams, and abnormally on hypnotic suggestion, in somnambulism, and on stimulation by drugs and diseased blood. Without such automatism of educationally elaborated structure a rational flow of speech, for instance, would be impossible, and it is reasonable to conclude that it must have been the use of speech continued and developed during countless generations that has succeeded in elaborating the wondrously complex organization of the special structures that functionally minister to linguistic expression. Still

structure ever so highly and fixedly organized remains structure composing the indiscerptible individual, to whom all this elaboration and its functional significance accrues as possession of his own.

By becoming functionally automatic the structure of the living substance remains nevertheless sentient. For its sentiency forms part of its very being and life. What is more especially called "consciousness" consists in the direct awareness of what is organically occurring. Such awareness is a functional outcome of the activity of central and centralizing organs. Attention, a central activity under volitional control, renders us, for example, conscious of our breathing, which is generally automatically, though not insentiently, carried on. Any interference with its automatism is instantly felt, and locally referred to what are perceptible as the functioning organs. That the breathing individual possesses, moreover, to a certain extent volitional control over his breathing, shows how automatic functions, especially those of complex structures that act in direct response to definite stimulating influences, stand more or less under the volitional control of the individual, occasionally exercised over them.

The function of structures or organs, that have been elaborated in direct interaction with and correspondence to specific stimulating influences of the medium, bears necessarily a purposive character in relation to them, although automatically performed. Intentionally volitional actuation in relation to the medium comes into existence and is developed in measure as accumulated and memorized experience causes to arise in the present moment of conscious awareness a simultaneous complex of such memory, presenting

therewith a complexity of means and ways for volitional choice. Before such memorized experience has come to accrue to the disposition of conscious volitional choice, and before the primitive and general self-feeling of the organism has been developed into specifically centralizing consciousness, the function of structures becoming specifically elaborated in vital interaction with definite influences of the medium acts reflexly, instinctively, or automatically on such stimulation in sentient response to it, but without conscious realization and choice. Experience, though not consciously realized, has been accumulated and organized in the acting sensori-motor structure; for its very constitution is the result of such experience. Figuratively, then, this consciously unrealized experience may be considered to rest organically memorized in the experientially elaborated structure,¹ and its function may be looked upon as an acquired habit.

The living substance and its structure once firmly established through functional elaboration as that which perceptually appears as a specific chemical compound, has then as such demonstrably a powerful tendency of its own to maintain its integrity against deteriorating influences by means of reintegrative assimilation of complementary material. To this intrinsic power of reintegrating itself is due its maintained integrity amid constant change, and above all the marvelous reintegration of the adult organism from a minimal reproductive germ. A germ has to be regarded as a chemical fragment of the adult organism from which it is derived, and which it has to reproduce through reintegration. This has been ascertained

¹ See Ewald Hering, "On Memory."

through direct research by the present writer. Such a germ contains, evidently, potentially all the characteristics of the organism it has faithfully to reproduce, and being sheltered from deteriorating influences and supplied with prepared nutritive or complemental material, it can achieve unhindered its task of gradual reintegration to eventual completion. It stands to reason that under such conditions — the organic individual being from beginning to end an indiscerptible whole — any firmly and correlatively established structural modification of his living substance will be potentially represented in the chemical fragment or germ derived from it.

The mere cutting off of the tail of an animal, or any mere mutilation inflicted upon it, and continued for ever so many generations, cannot possibly lead to its becoming an acquired inheritance, because no correlative modification of the entire unitary organism follows the artificially imposed operation. It is only through out and out correlative elaboration of the living substance of the organism in interaction with its medium that modifications become organically fixed and then transmitted to offspring. All organs and functions of an organism are correlatively interdependent. An organic change in any part or organ draws with it a correlative change in other organs, in order to restore equilibrium among them. This is strikingly illustrated when, for example, the size and function of the heart increase in measure as abnormal obstructions have to be overcome by its action, or, again, when on deterioration of one of the kidneys the other becomes structurally and functionally developed in order to restore the

¹ See "The Unity of the Organic Individual," "Mind," 1881. Also "The Vitality and Organization of Protoplasm," 1904.

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correlative equilibrium of the structures that compose the individual.

Correlative modifications accruing to the structures composing the organism are, and have ever been, individual acquisitions, for they are necessarily wrought upon the living substance of individuals during their lifetime, and could not persist from generation to generation if not transmitted to offspring. It is not too much to say that the diverse organization of all forms of life is the outcome of the transmission to offspring of correlative structural modifications cumulatively elaborated during the vital interaction of individuals with their environment. To deny that increments of progressive elaboration of structure acquired through functional activity are not transmissible to offspring is to attribute to random chance-occurrences all structural development hitherto attained and in future to be attained. In vain have foremost biologists taxed their imagination to explain how progressive tendencies are acquired by their assumed ultimate units, believed by them to constitute the reproductive germ, and to build up the organism, either by self-multiplication (Darwin, Weismann, De Vries), or by spontaneous generation (Spencer, Hæckel, Naegeli). It is wholly enigmatic how such ultimate units, held to have been originally of a very simple kind, and to have composed very primitive organism; how they have in the course of time become so radically and specifically modified and developed as eventually to be able in some unaccountable manner to build up by multiplication and aggregation the astonishing complex and yet interdependently organized structure of higher forms of life; forms of life that are moreover through and through adapted to inter-

action with a definite medium. In various ingenious ways has the perplexed thought of biologists labored to overcome the insuperable difficulty attaching to the modification and development of ultimate units assumed to compose higher organisms. The utter failure of all these attempts has been at length exposed by the present writer on various occasions for more than twenty-five years, and no biologist has as yet ventured on a defense of this attack, which all too plainly discloses the fatal weakness of the position.¹

In order to undergo progressive modifications, the assumed organic units believed to compose the germ would have to evolve them out of their original fund of endowment, which would mean that they are primordially organized with a mysterious tendency progressively to develop, as maintained by Naegeli, and as Leibnitz asserted to be the case with his monads. In fact the assumed ultimate units of the biologists resemble in many respects the monads of Leibnitz. Haeckel even declares his plastidules to be primordially endowed with psychical faculties of a high order such as "memory" of past occurrences, and believes that all psychical phenomena result from the composition of besouled material atoms. The fundamental misconception underlying these attempts to make something higher result from the mere aggregation of elementary units has its roots in the belief that the properties and functions of inferior autonomous beings can unite so as to give rise to a synthetic product of a higher order than that which they themselves represent, which is impossible.²

¹ See "The Unity of the Organic Individual," "Mind," 1881. "Molecular Theories of Organic Reproduction," "Texas Academy of Science," 1895. "The Vitality and Organization of Protoplasm," 1904. *Jenasche Zeitschrift fur Naturwissenschaft*," 1882.

² See "The Dependence of Quality on Specific Energies," "Mind," 1880.

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It is obviously of the highest importance in many respects to recognize that the functional activity of the individual, and especially his volitional activity, can progressively elaborate structure, which is transmissible to offspring. In fact, initiative activity on the part of the individual has been the most important factor in the elaboration of animal structure, as paleontologically demonstrated by Cope in his "Primary Factors of Organic Evolution."

But what part does consciousness really play in organic life? It is epistemologically a highly suggestive fact that the living and acting individual is nowise himself directly aware of his own organic constitution, and therewith of his own means underlying his vital activity. His phyletically elaborated organization, which enables him to perceive more and more distinctly and comprehensively the outside world, and consciously or sentiently to react upon it in complex ways conducting to his welfare; of all these his anatomical and physiological belongings, so distinctly perceptible to the biologist, he himself is wholly unaware. He does not even directly know his own eye, by means of which the vision of the entire perceptible world makes its entrance into his being. His vital activities all take place without his having the least direct knowledge of the structural means that underlie them and through which they are actuated. Here, then, we come inevitably face to face with the principal vexed problem in science, in philosophy, and in ethics,—a problem that has staggered thinkers of all times. Are living beings really, as perceived by the biologist, or as perceptible by him, out and out structural machines set going by mechanical means; machines whose modes of motion have become developed through natural selection or similar mechan-

ical ways, to perform appropriate movements in relation to a given environment? Certain it is that no mode of consciousness can impart the least motion to any organ or member of the organism. It cannot be denied, therefore, that the biologist's objective or purely perceptual view consistently leads to a mechanical interpretation. Mechanical automatism, certain motions of a complex structural machine, is all he detects from his point of view.

Changing, however, the point of view, and contemplating gathered experience introspectively, which experience as conscious awareness has been recognized to include all we are directly cognizant of, what we perceive as our environment, and what we are conscious of as our own being and its activities in relation to its environment, turns out to be the only directly and actually given data out of which our entire knowledge becomes constructed. And this means that all we immediately know forms part of our conscious content, and is consequently of conscious or ideal consistency. Modes of awareness of whatever kind are an exclusively subjective experience unshared by any other being. And as they make up our all-revealing conscious content, which in its transient moments of actual awareness contains all in all we consciously realize as our own existence and the world at large, it constitutes thus the magic solipsistic circle which excludes all outside existence, out of which no philosopher has yet succeeded in escaping and in legitimately reaching with his thought any kind of outside world. This intimate, immediate psychical experience absorbs into itself the biologist as perceived, and with him his entire seemingly objective view. On the strength of this directly given and all-inclusive psychical experience, naturalists

are seriously beginning to discard in their interpretation all realistic implications seemingly involved, not admitting that the psychical phenomena signify anything beyond themselves. It has been clearly shown in former sections that this purely idealistic and solipsistic view leads consistently and inevitably to phenomenalistic Nihilism.

Granting, however, what has been at length epistemologically justified, and what is practically never doubted; namely, that the perceptual awareness of the conscious content signalizes the presence, characteristics, and activities of real perceptible existents, the essential question then arises regarding the relation which our imperceptible, unshared conscious content bears to our perceptible organism and its vital activities as exercised in interaction with perceptible outside existents? Are modes of awareness mere epiphenomena ineffectively accompanying modes of vital activity which are automatically or mechanically actuated? Or are they in some way an essential and indispensable property of what is perceptible as the organism, and therewith a determining factor in its conduct of life?

Having direct experience only of our own individual human consciousness, we must, before we can venture on any well-grounded inference regarding the part that sentiency plays throughout the scale of organic life, first find out what part it plays in our own life. As repeatedly urged, and, indeed, as generally acknowledged, nothing of conscious consistency, nothing psychical can set going or effectively influence any vital activity. Conscious states are wholly forceless and transient. The impression to the contrary experienced in the case of our voluntary movements; the

validity of physical and psychical interaction here intuited, has been shown to be wrongly inferred by recognizing that the perceived phenomena involved, consist really of mere sense-stimulated perceptual objects. These apparently, but only apparently, cause commotion in the sensory organs, which commotion is then propagated along in-going nerves to central regions, and down again along out-going nerves to the muscles. Now, not only are actually perceived objects mere modes of perceptual awareness forming part of the observer's conscious content; but these perceptual occurrences form, moreover, an unbroken enchainment of physical events, leaving nowhere any room for the ingress of, or for means of producing intervening or interfering psychical phenomena or psychical actuation. The simple explanation of this want of efficient connection between the physical or perceptible phenomena and the psychical or imperceptible phenomena, was found, as repeatedly mentioned, in the fact that the former, the physical phenomena, are phenomena within the outsider's conscious content, while the latter, the psychical phenomena here referred to, are phenomena exclusively within the conscious content of the observed subject. This observed subject has no direct knowledge of the perceptually revealed belongings of his own being, and can, therefore, have no direct awareness of their modes of interaction. The impression of interaction, which, nevertheless, exists, is elicited in a roundabout way; namely, by sense-acquired and memorized perceptual experience of one's own perceptible being. The feeling we experience when our heart is violently beating, or when our breathing becomes labored, does not as such reveal in the least the existence and appearance of the heart or the lungs, and their

peculiar mode of activity. Only when we have gained a perceptually revealed knowledge of the heart and the lungs can we attribute our feelings of their activity to them as thus perceptually revealed.

Granting, then, the genuineness of the realistic implications of what appears in our conscious content, granting the real existence of what is positively felt, believed, and relied upon to be in fact the life of real perceptible individuals in interaction with a real perceptible world; granting that all this is not a mere insubstantial psychical phantasmagoria; it is surely a most pertinent desire to want to know what part the imperceptible consciousness or sentiency of perceptible beings is playing in their conduct of life. It cannot be denied that this question discussed more than any other, scientifically, philosophically, ethically, and theologically, has as yet received no satisfactory answer.

It is certain that all we are individually conscious of as our own being and the world at large exists only as the conscious content of our moment of actual awareness, called the present. This all-revealing conscious presence forms for each of us the felt, sensed, perceived, and cognized panoramic medium in which our life is consciously carried on. Although the content of this present awareness, in which we consciously have our being, and amid whose appearances we sentiently and consciously conduct our life; although it is only a transient phenomenon, it is sustained as enduringly present by the vital activity of the organic matrix whence it issues, and it is essentially organized to focus in its moment of duration and spatial expanse a vast world of diverse psychical states. Among these states three groups of essentially different significations may be distinguished: first, definite intrinsic feelings of the

vital activities, of what perpetually proves to be the activity of definite organic structures. These "organic" feelings are concerned with feelings arising from organic needs and from their subsequent satisfaction, second, cognitive modes of consciousness referring principally to outside existence, such as compelled perceptions and their remembered and systematized ideas or concepts, and third, feelings of reaction in relation to influences which outside existents have or are expected to have in the well-being of the conscious individual.

Here it is important to recognize that in physical state, in feeling, in pain, in sensation, in perception, in thought, in emotion, that in fact, the physical state has self-existence or self-significance, or is capable of being in reality segregated or isolated from its context or it actually exists within the all-encompassing conscious content of the feeling subject. Ideation systems, be they emotional, intellectual or volitional, all work with such structure and substantially hypostasized constituents of the conscious content, and lead, therefore, to strong conclusions. It is always the organic individual as an indivisible being who experiences as he acts, makes it effective, the different conscious states that arise within his content of actual awareness, and that convey to him the information which enables him to guide his life in relation to his complex environment. For the same organic individual is not only potentially equipped with accumulated and memorized physical information, he is also a large-endowed motor agent capable of effectively and appropriately acting upon such information.

It is clear that the same inputs and definite the conscious information of the individual happens to be, and on the other hand the same converge to his

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general vocal and ethical without his content, is carried on in relation to his physical information, the more progressively rational will be his mode of life. The possibility of acting rationally, and not merely automatically, instinctively or impulsively, is given on the one side by the flowings of wide-reaching conscious information into our moment of actual awareness, and on the other side by our rational control over what are perceptible as our immediate sense organs, whose impulses are in themselves known as "instinctive impulses." I can now what is actually general, as my aim, is more definite now, and I can stop or adjust the movement. In doing this I am directly guided by definite organs, existing which indicate to me their status as they are specific for the particular of the member I intend to move. The knowledge which is my guide is the product of what I or others see or feel, and as the aim I am going to move.¹ It is true that the usual awareness of my aim can greatly assist my guiding consciousness, but it is a suppressed witness of the purely intrinsic guidance. I am able to control my aim by the use of definite or several organs, sensation. I can stop it as readily as any possible way I please without the aid of external sense-derived guidance. But without such guidance I am entirely unable to perform intentional purposeful movements. It will be the same as if I had consciousness of aim or that I directly perceive or indirectly realize an intention as the perceptible will.

The general influence existing between the direct and indirect awareness of an object, objectively and sub-

¹ See "Sensory and Motor" (ibid.), pp. 117, 118.

indirect outward sensorial awareness; the former being far more immediate and intimate than the latter; also the means of sensorial information and the matrix in which it is potentially gathered and systematized, together with the liberation of volitional from necessitated actuation, all these essential distinctions have been structurally and functionally accounted for by biological research. Their respective pathways and seats, displaying wondrously complex and minute organization with multifold intercommunications, have been perceptually disclosed by laborious investigation. To the biologist who has attentively and thoughtfully entered upon this fundamentally important study, purely idealistic views must appear strangely visionary. He can no more imagine psychical states existing independently of what is perceptually revealed as organized structure, than he can imagine a shadow existing self-sustained in vacancy.

What is called a conscious motive to action is an intended motor actuation urged by some felt need or desire, and aimed at the attainment of a definite something believed to exist in the outside world that will satisfy this need or desire. The so-called "motive" has itself no inkling of moving or causative power, for it consists altogether of psychical factors, and is therefore a mere forceless complex of modes of awareness. The organic individual, as a force-endowed, extra-conscious existent, is here the real motor or causative agent, constitutionally endowed with the power to actuate at will those of his organs that bring him into direct connection with the outside world, in order to attain definite ends in relation to it, guided thereby by what is in direct presentation or recollectively present in his conscious content.

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When a definite sensation, percept, or idea is immediately followed without conscious intention by an appropriate motor reaction, it would seem as if the psychic state were itself the moving power. The truth is that the actuation, like all actuation in nature, takes place altogether in unknown ways in the sphere of extra-conscious existence; and that the sensation, percept, or idea, seeming to cause the action, serves only as sentient signal to the organic sensori-motor or ideo-motor process, felt as a psychical state by the acting individual and perceptible as a motor outcome by outsiders. In consciously intentional actuation the mere guiding part which conscious states play in the process becomes unmistakably obvious. The ancient puzzle as to what part consciousness or sentiency play in the conduct of life, and in existence in general, is solved by recognizing that it indispensably and exclusively serves as guidance in all our actions. Of this there cannot be the slightest doubt. It is indeed almost self-evident. We are at all times obviously guided in our actions by what we are conscious or at least sentient of. The room I am sitting in, the landscape outside, the wide world beyond, are as consciously perceived or imagined by me, incontestably a visual phenomenon forming part of my conscious content. And it is clearly by means of this visual phenomenon within my conscious content that I am guided in performing purposive actions in relation to what is thus visually revealed. As soon as I shut my eyes, unless I have learnt to be guided by tactual feelings and their recollection, I have therewith shut off my actual conscious guidance, and abstracting from visual remembrance I am completely at a loss to find my way, and to attain my aims in the perceptible world.

My actions, as consciously guided, are directly aimed at what is perceptually or recollectively present in awareness. When I go to move a chair which I perceive some distance off, the chair I therewith actually perceive forms part of my conscious content, and specifically part of its visual awareness. When I grasp the perceptible existent now visually present to me, I certainly do not really grasp this chair forming part of my conscious content, though to my own consciousness, and to that of outsiders, I seem to be moving what perceptually appears. But if I cannot possibly be moving the chair forming part of my own visual awareness, I am surely not moving the many chairs forming part of the visual awareness of a number of outsiders. The visual chair might be altogether an optic illusion, though just as vividly present to me as if it were a real chair. In grasping it, however, the tactual feelings, and especially that of resistance, carry with them the assurance, or at least the conviction that I am grasping a power-endowed existent far more abiding and solid than the visual chair forming this moment part of my conscious content, and which vanishes out of existence whenever I shut my eyes. The obvious conclusion is, that my visual percept, and my tactual sensations spatially coinciding with it, signalize to me the presence and characteristics of an existent having its real being outside my conscious content, and subsisting quite independently of my casual awareness of it. It is this real existent that I am grasping and moving by force of my own real power-endowed organic being, and not by force of anything forming part of my conscious content. It is by means of a genuine preëstablished harmony between the sense-stimulated visual chair and the sense-

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stimulating real chair, that the visual chair acts as reliable guidance in the execution of my intention to move the real chair.

The medium or environment in which we consciously move, and whose perceptual appearances, or their memorized representatives direct our intentional motor actions; this consciously apperceived medium with all its diverse phenomena, consists entirely of states of awareness composing our all-revealing conscious content. And our intentional actions are not only guided by them, they are moreover directly aimed at them as they perceptually appear. It is wholly a matter of preëstablished correspondence between our modes of perceptual awareness and the sense-stimulating influences of the outside world signalized by them, that these same actions of ours guided by perceptual awareness, and directly aimed at its appearances, are therewith brought into efficient interaction with the real extra-conscious world; that, for instance, the hunger I feel, and the apple I perceive, as forming part of my conscious content, are found on my grasping and eating the apple - an operation consciously performed within the sphere of actual awareness - to correspond in the extra-conscious world to a real apple which as property of its own is endowed with the means of appeasing my hunger.

An insect sense-stimulated by outside influences to which its modes of sentiency have been specifically and correspondingly adapted, and impelled by organic needs in structurally and habitually established ways; this insect moves likewise wholly within the psychic medium composed of its sentient states, organic and sensorial, and is in its actions exclusively guided by them. These intrinsically actuated performances, per-

ceived and apprehended by outsiders as purposive and instinctive movements, are rendered efficient in the outside world by means of phyletically preëstablished correspondence. This seems to be a justified analogical conclusion.

The reason why the indispensable and exclusive office of sentient and conscious states in directing and guiding movements, inclusive of loudly or silently uttered speech, has so long been philosophically mystified and misconceived, this reason is found in the fact that materialistic and mechanistic views, on the one hand, have failed to recognize that that which is actually perceived is merely a forceless conscious phenomenon, and not the real force-endowed existents revealed and signalized thereby; and that, on the other hand, idealistic views have denied the extra-conscious significance of perceptual awareness. You start with nothing but matter and motion, and necessarily a purely physical and mechanically moved world results, in which sentiency and consciousness are of no service whatever. Or you start with nothing but self-existing psychical states, aggregated, associated, or self-evolving, and, of course, an insubstantial, purely phenomenalistic world is the outcome, in which nothing can have enduring consistency and transphenomenal significance.

In consciously intended purposive actions of any degree of complexity it is conscious memory that affords the principal guidance. Direct perception assists indeed step by step, but the focusing into the moment of actual awareness of such remembered experience as is connected with the intended action is really that which directs it as a whole, and enables it to be consciously and consistently carried out. Now it is evident that the latent potential accumu-

lations and systematizations of experience capable of being consciously remembered in the moment of actual awareness, as well as the subtly intricate volitional power of performing intentional purposive actions; that these faculties are developmental acquisitions of the highest order in the scale of organic life. Like every developmental acquisition these also have been organically elaborated within the living substance through functional activity in relation to the medium.

Biological research has positively demonstrated that volitional, intentional, or skilled activity is a gradual acquisition superadded to reflex and instinctive modes of activity. Special pathways and central structures are proved to minister to such volitionally directed activities. And of these those ministering to speech are perhaps the most instructive with regard to dependence of definite modes of activity or function upon specific neural structures definitely localized. Articulation involving special organic sensations, audition, vision, tactual feelings, are all factors implicated in linguistic expression and comprehension. Special perceptible structures embody each of these different vital functions which are more or less intimately interconnected and associated, forming thus a far-reaching, intricate sensori-motor and ideo-motor complex. Their united import seems to be realized in the "Island of Riel," constituting it a special organ of speech. manifold definite defects of speech become perceptually traceable as dependent on disorganization of one or the other central region which contributes to linguistic expression and comprehension. And, as intelligent conceptual thought is admittedly dependent on language, and language proves to be wholly dependent on specific organic structure, it follows, that "intelligence"

or "reason," believed by idealists to be a self-subsisting entity, is in verity a mere conceptual abstraction from the conscious phenomena that functionally issue from the specifically organized matrix of speech, perceptually revealed as definitely located neural structures.

The organic matrix of speech, consisting of definitely revealed brain-centers, is an inheritance of phyletically elaborated structure, endowed with specific potential functions. In order that these structures may become functionally actuated in individual life, it requires, however, not only the mere stimulus of articulated signs, expressive of conscious experience, received and imitated; but it requires, moreover, the organic retention of the structural traces of such definite articulation, together with its significance, in order to serve in future as guidance in volitional linguistic expression. Without linguistic education leading to such organically yielded information issuing from modifications of inherited linguistic centers, though these may have been perfectly efficient at birth, the individual would remain speechless, and therewith devoid of such intelligence as is inseparably connected with speech. This want of conceptual intelligence is strikingly manifest in linguistically uneducated deaf and blind persons.

Here it is relevant to remark that in speech the guiding import of consciousness in relation to purposive actuation is preëminently manifest. Speech as a physical performance has no meaning whatever except in relation to consciousness. Its sole *raison d'être* is to give physically efficient articulated expression to conscious states, and to arouse thereby corresponding conscious states in other persons. If we consisted of psychical stuff only as Idealism maintains, speech would be impossible, and we would be not only imper-

ceptible to one another, but our thoughts, if such we could then have, would be incommunicable. Moreover, without speech, which is an individual acquisition, rational thought, and therewith "reason," would be non-existent. There is no escaping this conclusion, which is pregnant with momentous implications.

All consciously intentional or voluntary activities are in a more or less degree skilled activities, that have become more or less completely detached from the original reflex, instinctive, or purely impulsive modes of activity. When skilled activities become by dint of habitual performance secondarily automatic or executed without special conscious attention, such individually acquired automatism is not, as has been maintained, a relapse into the original automatism of lower centers, but is due to newly organized sensori-motor connections within higher central structures, being an outcome of conscious experience, that can have become memorized and potentially stored only in higher central structures.

The power of performing intentional purposive actions is a specific functional endowment of our organization, that has become developmentally superadded to pure sensori-motor actuation. In order to gain introspective cognition of this volitional power of ours we need only experiment with our breathing. We are able volitionally to deepen it, to accelerate it, and to inhibit it for a while, until the normal automatically propelling organic need overcomes the intentional inhibition. This volitional control proves clearly to be a mode of actuation superadded to the mere automatic action. But that which empowers us thus volitionally to act remains withal inscrutable. We find that we can volitionally actuate certain apparatuses of our

organism. In what this volitional power itself consists we can form no idea. Volitional actuation is, however, no more enigmatic than that which underlies and propels purely automatic action. In fact, all manner of activity in nature, even the most simple kind, is only known to exist and to be at work through its manifest outcomes. Advocates of the mechanical theory of actuation deceive themselves when they believe they really understand what is giving rise to modes of motion taking place through push or pull. So obscurely unintelligible is the power of a body to impart motion to another body, that the performance can be intellectually assimilated only when placed in analogy to our own directly experienced though likewise enigmatic power of moving our own and other bodies. We move bodies by being organically endowed with the power of moving what are perceptually revealed as our members specially adapted for the ends of such volitional actuation.

It is a fatal mistake to believe that we understand activity in nature by asserting that it consists of what is perceived or felt as such, of nothing therefore but motion, or in case of our own movements also of feelings accompanying it. All activity in nature is perceptually and therewith merely symbolically revealed as modes of motion, and our self-activity, moreover, as intrinsic feelings. But, as repeatedly urged, motion is itself nothing but a mere forceless conscious sign of real activity, and nowise itself the veritable forceful, change-producing agent. The same forceless nature attaches to the sensation of effort and to other sensations of vital activity. They are all likewise only forceless conscious signs of extra-conscious activities that may perform their work at times quite without the accompaniment of conscious awareness.

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As already indicated, no volitional movement is possible without our becoming intrinsically aware of the special member we intend to move, and therewith of its definite position in space. If my intention is to move my great toe, I must first gain intrinsic awareness which singles out this special member from all the rest, and which informs me in which spatial direction I have to exert my volitional power. By means of specific organic sensations, constituting local signs, we have an intrinsic apprehension of the space occupancy and spatial form of our entire body, and especially of each of its surface areas, irrespective of visual and tactual exploration.¹

In us human beings, next to articulate speech, the hand and its fingers are the members most intricately subject to volitional or skilled activity. Flechsig has computed that there exist more than one hundred thousand distinct neural paths in the service of volitional activity connected with tactual sensations. And he rightly concludes that this accounts for the minutely complex and graduated motility of the hand and its fingers. Helen Keller in one of her writings beautifully and pathetically praises the consciousness-informing potency of her hand, her only direct bond of union with her fellow-beings and the whole outside world, — her motil hand whose exquisitely sensitive touch is to her all-revealing. The surmised ideal Ego of transcendentalists must be a wondrously expert telegraphist to be able to tap in due coördination the one hundred thousand neural wires, of whose existence it has, moreover, not the least inkling. The physiologist, however, can in a crude manner really tap these neural wires, and elicit thereby definite movements of

¹ See "Space and Touch," "Mind," Vol. X, 1885.

the hand, the fingers, and of most movable regions attached to "voluntary muscles." Either, then, these marvelously complex structural arrangements distinctly perceived, and whose specific functions are physiologically and pathologically demonstrated, are what Idealism declares them to be, a mere illusion of sense devoid of realistic significance. Or, on the other side, the view of Idealism, vaguely and exclusively based on mere forceless and transient phenomena of solipsistic awareness, is itself a visionary conceit, and as such an utterly misleading interpretation of nature. The biologist, on the strength of our scientifically acquired knowledge of nature, cannot help looking upon the idealistic view, eminently elevating in many respects in the past, to be now a hindrance to further human progress. For to him progressive development is strictly dependent on elaboration of what is perceived as vital structure, attained through interaction with a complexly and progressively molded physical and social medium.

Volitional power over our executive members would be of no avail, unless intentionally directed towards the attainment of a definite end in view. And this end is found only in the perceptually revealed outside world, be it social, artistic, scientific, be it craving for food or craving for affectional or intellectual congeniality. Volitional actuation in whatever direction exercised modifies structure, leaving it fit to execute more readily the volitional behests, and to harbor the potential memory of what has been intentionally achieved. No memorized experience, or result of volitional training, can abidingly exist anywhere but in what is perceived as organic structure. It seems strange that so obvious a fact is generally ignored with

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regard to neural structures, while it is unhesitatingly and indeed inevitably admitted with regard to muscular structure, whose volitionally attained development in bulk and in multifold modes of skillful execution are directly perceptible.

It has been shown that, with us human beings at least, our intentionally purposive activities have necessarily to be guided by intrinsic as well as extrinsic modes of conscious awareness. The inward conscious awareness of those organs that bring us into contact with the outside world, and the conscious awareness of this outside world upon which our activities have to be exercised; these modes of inner and outer awareness are found actually to guide us circumspectly and at every step in the execution of our purposive activities. It is clear, and has to be insisted upon in opposition to contrary views, that consciousness in all its modes has no other significance for life than to serve it as guidance in its interaction with the perceptible outside world. Without consciousness, without actual awareness of our organic, affective, or intellectual needs, and without the direct or memorized awareness of the objects of desire or of satisfaction belonging to the outside world or attainable therein, and of the conditions which admit of their appropriation or realization; without these various modes of consciousness there could be no intentional purposive activity, and therewith no human self-determination, no rational, no ethical conduct.

The purely mechanical interpretation of nature, still in the ascendant among scientists, maintains, on the contrary, and has consistently to maintain, that consciousness inclusive of all modes of sentiency plays no part whatever in the seemingly purposive activities of

organic beings; that all this can be satisfactorily accounted for by the mechanical theory. And, in aid of such mechanical interpretation of vital phenomena, so-called "tropisms" are brought forward. Mechanical contact, light, gravity, chemical action, electricity, are declared mechanically and adequately to set going the seemingly purposive activities of the organic mechanism of living beings. Taking light as an illustration of its efficiency in giving rise to phenomena of tropism, a plant, for instance, is obviously affected by light. Its blooms either turn towards it and open through its influence, or they act in a reverse manner. On account of this the plant is said in the former case to be positively, and in the latter case to be negatively heliotropic. But is this behavior on the part of the plant really altogether due to heliotropic equilibration which requires symmetrical exposition to the stimulating influence? The opening or shutting of flowers on exposure to strong light would rather seem to be an effect of phyletically established organic adaptation or ingrained habit, and not merely an effect of momentary stimulation. And how can tropism of any kind account for the automatically performed tentative gyrating movements of tendrils, whose purpose is evidently and visibly to find some object to wind themselves around? It would be no easy task adequately to account for this purposive habit.

An animal might possibly attain heliotropic equilibrium by being mechanically or structurally compelled to place itself so as to be symmetrically affected by light, and its cephalic pole would then point towards or away from the source of light because its optic mechanism is more forcibly stimulated by light than any other part of its body. But why the animal should, moreover,

move towards or away from the source of light is no-wise explainable by the mechanical theory of tropism. It is, on the contrary, obvious that the locomotive movement of animals is principally propelled by inner organic needs, and not by external stimulation. A moth, and all night-prowling animals, move at random, urged by organic needs, especially those of hunger and sex, and are seeking more or less instinctively objects of satisfaction in the wide world. They are specifically attracted by those particular objects that will satisfy their needs, evidently guided thereby by organically attuned sensations of smell, sight, and hearing, which reveal the presence of the object of satisfaction. Surely the far-wafted minimal particles of a definite odorous substance affecting the olfactory organ of an insect, a large beetle, for example, cannot possibly work so powerful a change in its structure as to cause its motor organs mechanically to impel its entire heavy body headlong towards the distant source of emanation? In watching a dog eagerly following a certain track, how can one mistake that he is sentiently guided by a subtly specific sensation of smell selected from among many other kinds met on the road, and being, moreover, aware through memorized experience of the significance of this sensorial sign in relation to a definite existent to be found in the outside world? No mechanical interpretation can account in the remotest degree for this highly complex vital performance of the sensorimotor and ideo-motor animal being. Nor can it account for the simplest vital phenomenon.

Adapted habits of living beings phyletically acquired in relation to their organic needs, and to the means and ways of their satisfaction in the outside world, are organically or structurally fixed as potential abilities.

They are felt as needs when urged towards actuation, and are then guided in their execution by sensorial awareness. The biologist discovers perceptually the morphological appearances of structures underlying physiological functions. The organic being itself, driven by felt needs and guided by sensorial awareness, experiences only definite modifications of its self-feeling. These are, however, extra-consciously or extra-sentiently connected with definite motor outcomes as perceptually revealed. The living being is throughout sensori-motor, but "sensory" inwardly to itself only, "motor" as outwardly perceived. Its structures, which embody the potential abilities, having been adaptively organized in specific relation to definite modes of stimulation emanating from outside existents, these modes of stimulation, when brought to bear, elicit the actuation of the potential abilities. An insect selects from all manifoldly different plants encountered on its way the one only upon which to deposit its eggs that will afford suitable food for its progeny. This is evidently due to a specifically organized relation between the definite smell of the special plant and the insect's egg-laying need. The specific smell attracts and guides it to the particular plant, which elicits on contact its egg-laying function.

It is organic adaptation to conditions of the outside world that brings about a definitely preestablished harmony between the functions of the organism and the external conditions in relation to which the functions are exercised. But the organic beings themselves are directly aware only of their own modes of self-feeling, some of which symbolically represent to them the real, extra-conscious world, accompanied by other modes of feeling indicative of the memorized experi-

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ence of the effects which the influences of the outside world have had, and are apt at present to have, on their own welfare. It is, then, by means of incited modes of self-feeling that living beings are guided in their actions. But the fact that their actions really accomplish in the extra-conscious world what they desire and aim at, is entirely a matter of preëstablished correspondence between structural and functional adaptations and the real, effective conditions of the outside world. Let the guiding modes of self-feeling of the individual become disordered in their relation to the conditions of the outside world, and his actions will no longer correspond to what really exists in this outside world, on account of which his mind is then said to be "deranged."

The self-feeling of living beings has necessarily as many gradations of complexity and of inwrought discriminative modifications as there are gradations in the scale of life. The self-feeling of a being low in the scale of life, with only primitive tactual awareness of outside existents, will be of an entirely different order from the self-feeling of one high in the scale of organization, that besides developed tactual awareness is additionally endowed with a number of other sensorial modes of awareness, together with their synthetic combinations. The complexity and superiority of the entire organization of highly developed living beings has been phyletically wrought through superior adaptation of their manifold modes of sensorial awareness in response and in relation to the influences of the stimulating medium. What other meaning could the progressive elaboration of the world-revealing sentiency or consciousness possess than growing fitness to functionally serve as guidance in the conduct of life carried on in relation to the

world thereby revealed, and to which it has become in all respects organically adapted?

As to the real nature of the outside world, which becomes thus progressively revealed through the development of sensorial awareness, and as symbolically represented in the conscious content, we possess no faculty enabling us to gain an adequate insight into its hidden profundities. And neither are we able to understand how it comes that developmental increments of what is perceived as structure, creatively inwrought into the living substance, are found to embody progressive modes of world revelation, and progressive means of actuation in relation to it. We can only inferentially judge of what has been and what is being creatively accomplished by means of what is consciously revealed. And in order to become certain that our judgments really correspond to what actually exists, we have to submit them to rigorous scientific verification.

Each sense reveals the world in its own specific manner. The world of touch, of hearing, of smell, of vision, are each all but complete in their own particular sphere. Yet they signalize within their special sensorial medium the presence and distinguishing characteristics of one and the same universe; affording thereby concurrent guidance to one and the same organic being in his interaction with the outside world. Each sense has at first been structurally and functionally inwrought into the living substance independent of the rest, and has been elaborated as a separate sensori-motor system, structurally connected, however, with the general system of fused executive motor apparatuses. Eventually the different senses have also become more or less intimately connected with one another. Their combined conscious import with regard to cognitive world-revela-

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tion, and to motor abilities, are embodied as memorized experience and potential vital functions in definite synthetic structures, which have been shown by Flechsig to occupy in human beings two thirds of the substance of their cerebral hemispheres.

Kant, who was conceptually aware of the nature-constructing efficiencies at work within the human being, declared that nature is made by the understanding. "Der Verstand macht allererst Natur." To express the fact correctly he should have said that nature becomes consciously revealed in living beings by means and in measure, as structural and functional elaboration have been wrought within their living substance through interaction with the influences emanating from what in terms of consciousness is called "nature"; but which in verity is a symbolically revealed and otherwise unknown complex of interdependent, extra-conscious, power-endowed existents, to which our own being wholly belongs.

It would be, and is, indeed, actually greatly misleading to believe, that in case we could get to know the intimate, self-existing nature of what is perceptually revealed, we would gain a far more profound and enlightening insight into that which constitutes reality, an insight which would be of superior interest to us, than that at present gained by means of our symbolical modes of consciousness. It is true that our consciousness, being utterly forceless and transient in all its modes, has nowise the power to penetrate understandingly the nature of that which imparts efficiency and permanency to the existents that compose the real, extra-conscious world. The intimate constitution of the something of which it is composed remains unrevealed to consciousness, and so also its

sundry modes of efficiency that manifest themselves as mechanical impact, cohesion, elasticity, chemical affinity, gravity, and radiant energies. These consciously manifest phenomena emanate from modes of actuation unintelligible as such, and consciously assimilable by us only in analogy to feelings aroused by our own extra-conscious activities, which remain as such likewise unintelligible.

Moreover, our own extra-conscious efficiencies, when brought to bear on outside nature, have no power whatever to impart to it new modes of efficiency. They can only afford to its potentially preëxisting efficiencies new occasions to manifest themselves in new relations. This merely vicarious aid of ours, limited to the giving of advantageous opportunities for the potential efficiencies of nature to become actual in new ways, applies also to the potential efficiencies inherent in our own organic being, which likewise may be rendered active by giving them favorable chances to exercise themselves. A striking illustration of this developmentally and educationally momentous fact are the many opportunities for actuation of the potential efficiencies inherent in plants, which Luther Burbank's intelligent and sagacious aid gives them in this or that direction, and which lead to astonishing creative results, demonstrating the unlimited potentialities that may become actual in universal nature and especially in the sphere of already highly elaborated organic life.

But if in our own being its modes of consciousness are themselves unconsciously developed in the hidden recesses of creative nature, and are able only vicariously to aid organic elaboration without having direct efficient power over it, and if our modes of conscious

awareness only symbolically reveal the presence and characteristics of the existents composing extra-conscious nature, it is on the other hand true that this extra-conscious nature undergoes in its symbolical embodiment within the wondrously significant complexity of what is perceived as organic structure an exalting transfiguration, which by dint of the ingrained powers of the living organism assumes a sentient and intellectual worth not found in the other insentient and unconscious existents of outside nature. Life on earth is altogether and most intimately dependent upon the radiant energies emanated, or being actuated in the intervening medium, by processes at work in the sun. Nevertheless, contemplating it all from the standpoint of qualitative worth, how can the huge masses of inorganic stuff composing suns and planets, together with the illimitable expanse of the insentient, power-laden medium of radiant energy; how can these crude bulks and potencies compare in achieved existential worth with the tiny but exquisitely organized creatures, whose structural and functional elaboration culminates in the all-containing, all-revealing consciousness of man, who has become capable of scientifically recognizing the true ways and the progressive drift of creative nature, empowered therewith inventively and constructively to utilize its actual and potential efficiencies in the service of his individual and social well-being and development; empowered also artistically to forecast ideal aims eventually to be attained.

Surely there is no valid reason why we should humble ourselves in the presence of the inchoate immensities of the universe, as if we were really the mere "dust" into which in time disorganization will

individually reduce us. So long as we are the living bearers of the uplifted torch of perennial life, the blind impassive cosmic stuff scattered throughout the star-peopled universe has, within the quickened substance which constitutes our being, become itself by means of endless vital toil a center of sublimated and glorified potencies, irradiating within the sphere of its all-revealing consciousness the harmonized efficiencies of the world's creative stress and strife, against whose dread outbursts and other multifarious dangers it seeks rationally to protect itself, aiming in its humanizing endeavor to eliminate the brutal sanguinary warfare, that, impelled by ruthless propensities, has hitherto irrationally but inevitably sustained the teeming life inhabiting the more or less uncultured wildernesses of this our dwelling-place.

VIII. TELEOLOGY IN NATURE

It is a most familiar experience, that with a special end in view we perform a definite series of actions in order to realize our designed purpose. Nothing easier than the performance of such purposive or teleological actions. But when we try to scientifically explain the familiar experience we find ourselves involved in a huge tangle of perplexities, which many centuries of sagacious and patient endeavor have not yet succeeded in fully unraveling.

We are aware of consciously determining to attain a certain preconceived end, and to design the series of means that will lead to its attainment. We are empowered to do so by what appears to be a mental faculty we call "intelligence" or "reason." Then, corresponding with the series of intelligently designed means, we execute by force of what we call our "will" a series of bodily actions that are intended to lead to the realization of the end we have in mind. How in most instances this realization happens to be actually effected as something detached from our own being remains profoundly enigmatic. But as regards the entire conscious teleological process, it takes place within ourselves and through ourselves. Intelligence, as a conscious faculty, seems to be throughout the conceiving, designing, and guiding principle. The end to be reached is intelligently forecast; the means to attain it are intelligently designed; and keeping the end intelligently in mind the whole teleological performance, from beginning to end, is intelligently guided. What

we are here aware of as "intelligence," the only intelligence we directly experience, the only intelligence we have actually any knowledge of, is certainly something consciously manifest within our own being, something of a conscious nature forming part of our own conscious content.

When, however, on the other hand, ends are unconsciously attained by a series of means, it must be something not possessing the same nature as the conscious intelligence we have experience of, which in such unconscious cases is the teleological agent at work. For instance, it is evidently something of an entirely different nature from our intelligence that realizes within us by an intricate series of means the end of digestion, or of any other vital function; and that without conscious forecast, and without any consciously designed means, directs teleologically the whole life of an insect or a plant to perform a definite most complicated series of activities that subserve the attainment of the predetermined final end of propagation.

Of what nature, then, is the unconscious teleological agent here at work? It is clearly a mere subterfuge of ignorance and perplexity to assume that in cases of unconscious teleology the same agency we know only as conscious is here likewise operative, but in an unconscious state; that it is intelligence of an unconscious kind which is here the teleological agent. Whole philosophies have, nevertheless, been founded on this spurious analogy. To a number of eminent thinkers the analogical inference or ontological postulation of an unconscious intelligence as the world-constituting principle has served to them as the most rational solution of the supreme riddle of being and becoming. But a bottomless chasm yawns in reality between such

teleological designs as are intelligently conceived and such unconscious teleological activities as we find otherwise operative in nature. To overbridge this chasm between conscious intelligence teleologically at work in human beings; for example, in the conception and construction of a watch, and the unconscious teleological agency operative, for example, in the production of an organism; in order to overbridge this bottomless chasm, thinkers have assumed an intelligence of the same conscious nature as our own, only of a vastly higher degree. A supreme conscious intelligence is, in fact, declared to be the agent that forecasts all ends to be attained in nature, and designs all means coöperating in attaining them.

If it is, indeed, a supreme intelligence analogous to our own that conceives all ends and designs all means which conspire to bring them about, where, then, does the "will" inhere that actuates the execution of the intelligent designs? Where the executive organs actuated by the will? And where the world of reality wherein these intelligently designed ends are actually attained as perceptible existents? These are some of the perplexities that confront intellectualist philosophers in their attempt to explain teleology in nature.

Starting experientially from actual human experience, we find that intelligence can conceive and design the appropriate means to construct a watch or any other mechanical contrivance, but can nowise of itself produce a real watch or any real machine. To accomplish this task, volitionally actuated executive organs have to be set to work upon externally sense-given material, and the resulting machine consists then of a perceptible object subsisting outside our own being wholly detached from it, and visible and tangible to all

outsiders. In analogically conjecturing a supreme intelligence as the conceiver and designer of what is teleologically accomplished in nature, we are certainly not justified, contrary to the nature of the only intelligence we have actual experience of, to conceive such supreme intelligence, moreover, endowed with an executive and world-creating will. To do so, nevertheless, is clearly to transcend all legitimate bounds of sound reasoning.

Starting, on the other hand, with an ontologically posited supreme intelligence, the task is then to show how such a pure intelligence manages to put forth the requisite creative volition competent to produce the perceptible objects which constitute visible and tangible nature, and with it the objects manifesting natural teleology. It is safe to assert that no panlogic dialectics has ever, or can ever, succeed in identifying a mere concept with the real things conceived as comprehended under it; to identify, for instance, my concept of a frog, teleologically or otherwise, that as such forms exclusively part of my own imperceptible conscious content; to identify it with the teleologically constituted real frog perceptible to any number of percipient beings. Thought and Being, despite all the dialectic ingenuity of transcendentalists, can never identically coincide, except in the symbolically all-inclusive imagination of the individual thinker. And even then his imagination must have been previously informed by actual sense-given experience. He must have actually seen a real frog, or at least heard one described, in order to imagine anything like it. In fact, in all the wide world there exists no more trenchant disparity than obtains between thought and being, between something merely thought of and its

actual existence in nature; between — if lofty conceptions are preferred — goodness, truth, and beauty as conceptually imagined in an individual conscious content, and goodness, truth, and beauty as actually realized in the perceptible world accessible to all.

Kant, from whose speculations Neo-intellectualism took its rise, soon arrived at the conclusion, that, even if from our own ability intelligently to conceive ends and to design means, we were justified analogically to infer that it is likewise an intelligent being that conceives the ends and designs the means to attain what appears to us as products of natural teleology; that even then we would not be justified in inferring that this intelligent being possesses the creative power required to realize in perceptible nature his ideal or intelligent plans. In his "Critique of Judgment" Kant consistently declares, that, in order to account for natural teleology the assumption of a supreme intelligent artificer is not philosophically justified, and much less the assumption of a creative intelligence. He finds that from actual experience we cannot legitimately infer that everything which happens in nature is really pre-designed. He insists that natural teleology is, in fact, unmistakably manifest only in living organisms. And after scrutinizing all ways of looking at the problem of natural teleology, he rested satisfied with the conception, that our faculty of apprehension is so constituted as to be compelled to regard the order and combination of natural occurrences manifest in living organisms as teleologically contrived. In his "Critique of Pure Reason" he had at length shown that by means of the physico-theological argument, the argument from design, the existence of a supreme, all-constituting being cannot be proved.

And no sort of Bridgewater treatises have had power to upset Kant's conclusion. Yet the contemplation of the cosmos as an ordered whole, with its perpetual drift towards development, and its evident teleological success in the creative formation of organic beings adapted to their medium; all this progressive formative becoming reveals a teleological bent in whatever underlies the activity which realizes the creative results.

Intellectualism, in order to overcome the essential difference obtaining between mere intelligent conception and actual creation, simply identifies, without the least warrant, conceptual intelligence with actuating will, actuating will with executing means, and mere execution with creative potency, until the climax is reached in Panlogism, in which an hypostasized, implicitly all-comprising eternal idea becomes explicitly manifest by means of self-evolving concepts. Pure intelligence, however, has had, and still has, rivals in the philosophical explanation of natural phenomena and their inherent teleological bent. Although from Anaxagoras to our present Neo-Hegelians the supremacy and teleological efficiency of "intelligence" or "reason" has been strenuously maintained; animists, on the other hand, from Aristotle to the present day, have assumed an unconscious principle or soul at work in the formative and vitalizing process manifest in organic beings. And from Augustine to Kant, Fichte and Schopenhauer voluntarists have conceived "Will," conscious or unconscious, to be the creative and teleological agent in nature. Moreover, from the Milesians to Hæckel Hylozoism, or the inherent animation of matter itself, is made to account for apparent teleology. And in opposition to all modes of teleological interpretation,

indeed entirely excluding their possibility, the conception of an endless enchainment of mechanically equivalent causation holds still sway among most scientific investigators.

In order to make room for a truly valid interpretation of teleology, and to gain a somewhat more profound insight into the agencies underlying it, an insight which involves what no mechanical interpretation can ever succeed in explaining, namely the qualitative distinction and worth actually obtaining among perceptible existents; in order to reach this more valid insight it has above all to be shown that what we have experience of as intelligence possesses as such no modicum of constitutive or creative power, but is merely a mode of our own human forceless awareness of that which is creatively constituted. To illustrate: I find myself in need of fire in order to light my candle. My acquired and memorized experience has taught me that when I strike a match it will ignite. This experience guides my voluntary bodily actions to seize what I perceive to be a match, to strike it, and to light my candle with it. I have intelligently forecast the end I desired to attain, and have intelligently designed the means to attain it. But it is quite evident that the intelligent forecast and the intelligent designing of the means to attain it have neither created the bodily organs required to execute my intelligent aim nor the match indispensable to realize it. And surely it is not my intelligence that has in the least degree endowed the chemically prepared piece of wood with the power to ignite on friction, and to light the candle perceptually revealed to me as a foreign existent not forming part of my own being. To argue as intellectualists are wont to do, that every-

thing here perceptually experienced is a mere illusion of sense, and that what in reality occurs is taking place exclusively in a realm of intelligible existence, is all too plainly contrary to actual experience, which clearly teaches that the only intelligence we have knowledge of has as such no power whatever to create or to bring into existence the least perceptible object, or to endow it with any degree of efficiency. Sensationalists, on their side, will here interpose, that it is not intelligence that gives rise to the things perceived, but that they are altogether composed of groups of sensations. For, so they argue, the executive organs we perceive consist evidently of a complex of visual and tactual sensations, so also the match, the fire, the candle, indeed everything we become conscious of. But the forceless evanescence of mere sensations, as actually experienced, is so glaringly evident that it is hardly conceivable how so many eminent thinkers have been allured to attribute endurance and constitutive power to them. To account for it, the epistemological difficulties in the way of legitimately transcending the solipsistic nature of individual consciousness have to be admitted as excuse for positing so eminently fleeting and forceless phenomena as force-endowed, enduring entities. And, despite Berkeley and Hume, force-endowed must percepts and their constituent sensations be conceived to be, in order to constitute anything of enduring consistency.

When the conscious aim is to build a house, and the designer has intelligently conceived the plan, it is surely an undertaking of an entirely different order to really build the house, to erect it part by part by working with volitionally guided executive organs upon raw-material perceptible at all times, and conse-

quently independent of the designer's and builder's casual perceptual awareness of it; and, furthermore, to trust the experientially ascertained solidity and other properties of this extra-conscious material as efficient to actually realize the intelligently conceived plan. Finally the finished house is found to subsist as an enduring structure, which detached from the exclusive consciousness of the designer and builder, often outlasts them for ever so long, and remains perceptible to all onlookers. These are plain and undeniable facts, evident to every one. If it were not for the insidious philosophical trap of pure Solipsism imprisoning thinkers within the magic circle of their own exclusive consciousness one would gladly refrain from insisting upon such obvious truths.

It would be well, then, to recognize once for all, that nothing forming part of the conscious content, nothing of a conscious nature, either of conceptual or of perceptual consistency, possesses the least constitutive or creative potency. Consciousness only symbolically reflects in transient modes of phenomenal awareness what in reality exists, and what actually occurs in the realm of extra-conscious being and creative efficiency.

Genuine teleology in the manifest products of nature is found unmistakably operative in the existents we are perceptually aware of as living organisms. These are developed from a reproductive germ into an adult being of minutely predetermined structure. The production of a specifically constituted adult being is here clearly the definite end predetermined to be attained through the multifold stages of development the germ is destined to undergo as means to reach the final realization. In reproductive development we have then

a genuine prototype of teleology in nature, a distant end as predetermined aim is reached by a series of intervening means. The final end eventually attained involves, moreover, a relation of parts to the whole they compose which is strictly teleological. For all differentiated parts and all sundry organs of the living being are integrant constituents of an indiscerptible whole, and perform concordantly **their diverse** functions in subservience to the wants of the unitary individual. The teleological nature of living organisms is furthermore evidenced by their developed constitution and conformation found to be through and through specifically adapted to carry on life in a definite preëxisting medium into which they find themselves born. And completing the teleological cycle of the individual life of organisms, the manifold and consecutive exercise of their vital functions in interaction with their medium during their whole lifetime subserves essentially the final end of propagation of their race. All these teleological occurrences are actually taking place in extra-conscious nature, and although they become symbolically revealed to individual consciousness by definite modes of awareness, these conscious modes of casual awareness are obviously not themselves the agencies which impose a teleological significance upon natural occurrences that would otherwise be only links in an unteleological concatenation of an endless series of causes and effects, nowise destined to concur in reality to the attainment of definite ends, through which they conjointly receive their true significance.

Of course, the kind of consciousness, capable of comprehensively grasping in one and the same moment of awareness the consecutive series of means that concur to realize a definite end, is itself the outcome of teleo-

logical organization. If the organic matrix of our consciousness did not harbor in latency the memorized and systematized experience of the series of means that brings about a definite end, and if this latently harbored experience did not become comprehensively conscious in our moment of actual awareness, we could not have any individual knowledge of teleology in nature, nor any power to conceive ends and design means to attain them. For lack of the conscious awareness of such latently memorized experience of a comprehensive kind animals cannot acquire conscious knowledge of any teleological complex of occurrences. And though their own organism with all its functions and their own life-history are teleologically constituted, they never become aware of it. This unconscious meaning and teleological drift of their vital functions in interaction with a specially given medium discloses how infinitely more fundamentally, essentially, and profoundly grounded extra-conscious nature really is than any kind of conscious awareness. Conscious awareness is, in fact, a mere consummate outcome of highly developed vital organization wrought by the creative potencies, through which all perceptible things and all modes of sentiency originate and are developed.

The present writer in his treatise, "The Vitality and Organization of Protoplasm," founded on many years of investigation of primitive forms of life, has attempted scientifically to interpret the observably given phenomena, and therewith also to account for their teleological constitution, and the teleologically adapted functions of the individual life of organisms. In another section a summary of the most essential results of this investigation is given. Here their application to the problem of teleology is called for. From

the very start vitality involves teleology. For vitality essentially results from interaction of what is perceived as a compound chemical substance with the medium by which it is surrounded. Contact with the active influences of this medium tends to disintegrate the unstable composite substance. Now whenever such a substance, each time it becomes partially disintegrated, gains the power and finds the means to fully reintegrate itself through incorporation of complementary material afforded by the medium, it has thereby acquired the property of vitality. Vitality essentially consists in functional reintegration following functional disintegration in reiterated sequence. Vitality is nowise a separate principle superadded to the chemical substance, and imparting life, animation, or besoulment to it. All this is the direct result of the interaction of the organic substance with its environment. It is through this vitalizing process that it becomes a "living substance." And in this functional relation of the living substance to its medium; in the dependence upon the disintegrating influences of the same, and upon its supply of complementary or reintegrative material, the foundation of organic teleology is laid. Through a complex series of means vitality as the proximate end is attained. On the one side a unitary composite substance has gained thereby the capacity of undergoing a significant movement of disintegration and reintegration. And on the other side a medium with which it enters into a threefold relation keeps the vital movement going. For, first, the living substance suffers functional disintegration through the dynamical influences of the medium; second, from the same medium it is supplied with nutritive or reintegrative complementary material; and, third, it receives

from it an allotment of atmospheric oxygen required to burn up the effete products of disintegration, enabling them thus to be eliminated from the vital cycle of occurrences. This complex process, which constitutes enduring vital activity, involves all the teleological characteristics of the living organism in all stages of development.

Manifold consecutive means have to concur in order to convert as their final end a lifeless substance into a living substance. This vitalizing process involves at the very start constitutional adaptation of the living substance to the conditions of the medium upon whose interaction its vitality is dependent. This interaction, which is of a threefold kind, determines the integrant organic interrelation of the functioning parts of the unitary living substance or organism. The part of the living substance which carries on the play of disintegration and reintegration becomes eventually developed into the ectodermic organs that embody the life of action and reaction with the outside world. Another part of the same unitary living substance develops concordantly into the entodermic organs which have essentially to supply the ectodermic organs with appropriately prepared complemental nutritive material. And a third part develops, in keeping with the ectodermic and entodermic development, into depurative organs fit by means of a supply of atmospheric oxygen to accomplish the elimination of effete products and unassimilable material. This threefold interaction of the substance composing organisms with its encompassing medium gives thus rise, through one and the same process, to its vitalizing movement, to its constitutional adaptation to the environment in which life is carried on, and to the organic interdependence of

all its parts. Further organic development consists in the gradual structural elaboration and specification of the same threefold interaction, in which the surface play of disintegration and reintegration takes the lead, involving gradual ectodermic development, and drawing with it the concomitant development of the nutritive and depurative organs. All these vital and organic relations are obviously of teleological significance.

It remains to point out the teleological relation of a reproductive germ to the adult organism into which it develops. How is this most striking example of "final causation" to be accounted for? The teleological reproduction of an adult organism from a given germ has to be regarded as an extreme case of reintegration from a fragment detached from a unitary organism. Small fragments artificially severed from organisms of a low type demonstrably reintegrate themselves to complete adult conformation, often of an eminently complex and specific kind. A germ may be legitimately regarded as such a fragment normally detached from the adult organism it has to reproduce. It clearly possesses, like the artificial fragments, the power fully to reintegrate itself to adult completion through assimilation of complemental material. The final end to be attained through the highly complex series of reintegrative stages is strictly predetermined.

These statements contain in general terms the scientific interpretation of organic teleology my biological researches have led me to adopt. They apply, of course, only to the perceptible nature of the organism and its observable development. There remain unexplained in the background not only the activities that give rise to phylogenetic development, and the position

of the living being in creative development at large, but also the significance of its sentiency, of its conscious awareness, and of the rational and ethical worth of its life.

To inquire somewhat more closely into the given conditions which underlie the teleological nature of organisms, we have to refer to the specific integrant relation which the elements that enter into a chemical combination bear to the integrated compound. By force of specific affinitive attraction these elements form integrant constituents, and not merely aggregated accretions of the chemical compound they concur to bring into existence. The newly produced chemical substance is found to be endowed with new specific modes of action and reaction in relation to other existents; and therewith qualitative distinctions, otherwise unaccountable, become introduced into the mere quantitative concatenation of causes and effects. With each newly formed chemical compound qualitative relations of the perceptible objects of nature and of their interaction with the influences of the cosmic medium are complexly multiplied. The specific relation of certain "elements" to certain other "elements," comprehended under the name of "affinitive attraction," and their definite mode of combination, give rise to more and more numerous and more and more complex chemical units. This natural occurrence may rightly be regarded as a kind of incipient teleology, because diverse means have here to concur to bring about a specific end-result potentially predetermined. Here, however, we enter the domain of productive creation, which belongs to an entirely different order from that of mere reproductive formation.

So-called evolution in nature does not consist in the

manifest unfolding of particulars implicitly performed in some protogenic substance. It proves, on the contrary, to consist in an eminently toilsome elaboration of products newly formed. And it is brought about by means of interaction between differently constituted and differently endowed extra-conscious modes of existence, whose characteristics become partially and symbolically revealed to consciousness as corresponding modes of sense-aroused perceptual awareness. An increasing number of specifically endowed products come thus into existence, which possess manifold modes of more or less powerful potential integrative affinities to other products, and also concomitantly more or less powerful modes of disintegrative efficiency to other different sets of products. There ensues a turbulent competition between integrative and disintegrative potencies, and the diverse specifically constituted perceptible existents resulting therefrom testify to the victory of integrative elaboration and formation. Such integrative results and relations may rightly be looked upon as of teleological import.

The real protogeneuous substance, whence all perceptible differentiation proceeds, seems more and more positively to be recognized in what is called the interstellar ether, an inferred substratum which appears to be itself homogeneous, and is yet the bearer of all modes of radiant energy, and the matrix whence all heterogeneity in nature issues into perceptible existence. How these to our logical comprehension wholly contradictory properties or attributes of qualitative homogeneity and qualitative heterogeneity can be inherent in one and the same entity; how a homogeneous substance can possibly potentially contain all heterogeneity which becomes manifest in progressive development;

such a state of things transcends at present our understanding. It is the Eleatic paradox in modern form, the Parmenidean problem of the One and the Many over again. It seems, however, to be a fact inferred from spectrum analysis, that what is consciously revealed as chemical integration starts from some kind of differentiation within a homogeneous substratum. And in organic substances it becomes evident how a very small number of distinct "elements" are capable of combining, or of being integrated, in numberless specifically differentiated combinations, which respectively manifest widely disparate qualities.

It is evident that the drift of what is perceptually revealed as chemical integration, and which involves the constitution and progressive development of an increasing number of qualitatively diversely endowed perceptible existents, is of teleological import, although endless potential possibilities of more or less stable arrangements and rearrangements are keeping up the restless stress towards new and newer formations. Still the dice with which the play of creative commotion is carried on are loaded in multifold winning ways, and fall in what we are aware of as the course of time into more and more complex and significant cosmic order and organic achievement.

IX. BIOLOGICAL FOUNDATIONS OF RATIONAL AND ETHICAL CONDUCT

To philosophical contemplation it seems almost self-evident that rational and ethical conduct are unthinkable without some degree of individual self-determination. For if the individual whenever he acts is from any cause whatever forced to act exactly as he is seen to act, he would then certainly be out and out an irresponsible automaton, without the least volitional power over what would be then wrongly called his "voluntary" muscles, and without the least directing power over the content of his conscious awareness.

In order, therefore, to give a scientific account of rational and ethical conduct as a natural outcome of our vital activity, it is indispensable to prove that we have in all reality self-determined volitional power over our actions; power intentionally to control the activity of our executive organs, in order to determine and direct the course an intended action shall take in its real execution. Only biological considerations can furnish this indispensable proof hitherto vainly attempted.

It cannot be denied that to current mechanical science, which operates with nothing but matter and imparted motion, all living beings have to be considered irresponsible automata whose movements, though seemingly volitionally intended, are in fact one and all mere mechanically necessitated modes of motion. Therewith is straightway denied all efficacy of "volition" over our actions, also over our modes

of awareness, and over the conscious apprehension of all that is found to occur in life. All modes of awareness, with all modes of feeling and thought, are in this view a mere ineffective, iridescent byplay to what of necessity mechanically occurs. Neither Descartes in the seventeenth, nor Huxley in the nineteenth century, nor any other consistently thinking biologist has seen his way to escape this inevitable conclusion of mechanical science, the conclusion that all movements and therefore all action of living beings are rigorously necessitated.

Psychical science, in its turn, assuming as it generally does, that causative sequence, as a concatenation of definite effects following necessarily upon definite causes, also rigorously obtains among psychical phenomena; in assuming this it is clear that such psychical science excludes likewise all volitional control we seem ourselves in a natural way to exercise over our actions. For if what happens in any following moment of time is strictly determined by what has occurred in the preceding moment, there is no room left then for the intrusion of any volitional self-determination, or for any kind of deviation from such a necessitated course of psychical causation. In case this conception really expressed the true state of things, then consistently Schopenhauer's statement of it would have to be accepted as valid. He says: "All that happens is firmly linked together in the causal nexus, and occurs therefore with rigorous necessity. What is to happen in the future is obviously altogether positively, certainly, and exactly determined, and can no more be changed than what has occurred in the past." Henry Sidgwick expresses in his "Methods of Ethics" the same conviction even

more sweepingly, for he declares that there obtains: "Completeness of the causal dependence of any volition upon the state of things at the preceding instant, whether called character and circumstances, or brain and environing forces." Surely ethics under such conditions could not possibly be thought of.

The notion of causative necessity still governs our psychical as well as our physical science, and the consistent outcome of it is undoubtedly out and out Determinism. Hence we have as a consequence of this belief in causative necessity either Materialism, which attributes everything that occurs in nature to necessitated physical causation, or pure Idealism, which attributes it to necessitated psychical causation. Or recognizing the insufficiency of either of these one-sided monistic conceptions, so-called psychophysical Parallelism is at present adopted as a hypothetical makeshift or quietus.

In a former section it was shown how physical or mechanical necessity is naturally overcome in the causative concatenation of occurrences. Nature by means of progressive development brings into manifest existence new force-endowed products, which introduce into the causative nexus new modes of action and reaction not mechanically necessitated. And, surely, manifesting preëminently such new modes of action and reaction, and constituting such newly elaborated force-endowed products of progressive development, are living beings. When they are compared to any non-living existent they are found to be self-acting in specific ways. Their movements are actuated from within, while the motions of non-living existents are all mechanically imparted from without. The modes of reaction of living beings, inclusive of all

modes of sentiency and conscious awareness, are evidently likewise a new production or achievement of creation wrought through increments of vital organization, and representing progressive modes of intrinsic reaction entirely absent in inorganic, non-vital nature. Consider what vast and complex intrinsic world of diverse physical and psychical abilities is in fact embodied in a highly organized living being. Nevertheless our present physical science seeks to reduce all these intricate microcosmic abilities to mere modes of motion; our psychical science, on the contrary, to mere modes of consciousness.

Now it is obvious that if we had really no volitional self-determined influence whatever, either over those inherent conditions of our own nature that in fact determine our actions from within, or over the external circumstances which induce or elicit these actions from without; also no control whatever over the perceptual awareness of the externally determining influences, and if we had, moreover, no effective use of the memorized recognition of the nature of their effects for good or ill on our being; if in all this we were really volitionally utterly passive and impotent, it would certainly be a pure delusion of self-consciousness to believe that we have, nevertheless, volitional, and therewith rational and ethical power to influence the occurrence and direction of our doings. And it would be a sheer waste of time to write ethical treatises, and to advance subtile and specious arguments in order to prove that despite absolute Determinism we are, notwithstanding, guided in our actions by rational insight, and are ethically responsible for them. If altogether psychically as well as physically determined by necessitated causal links, we are inevitably pure automata, as Spinoza and Leibnitz

actually declared us to be, "*Une espèce d'automate spirituel.*" If this were really so, then to speak of rational and ethical conduct would be simply absurd.

Kant, likewise fully convinced that everything which occurs in nature from moment to moment, whether psychical or physical, is causatively necessitated, assumed, in order to account for the actual fact of free moral self-determination, an "intelligible Ego" as constituting the veritable essence of our being, and as having its existence in a supernatural, noumenal sphere. To this noumenal Ego he ascribed the power of free causative determination, rendering it capable of coercing the phenomenally necessitated "mechanism of nature" into the achievement of moral purposes volitionally aimed at in obedience to moral commands imperatively emanating from the realm of intelligible existence.

Efforts to reconcile ethical self-determination with whatever sort of causative necessity have ever proved a hopeless task, though persistently attempted ever since man's thoughts were directed to this puzzling antinomy. The problem has evidently been wrongly conceived. It can be solved only by showing that causative necessity as formulated by theological necessitarians, philosophical determinists, and mechanical science, does not apply to man, who is organically equipped with self-determined abilities. That such is really the case, and upon what conditions these self-determined abilities depend, shall be made evident in the further course of this disquisition.

Kant's fanciful transposition of our organically developed power volitionally to determine ethical and other modes of action, transposition of it from our perceptible self where it really inheres, to a purely assumed intelligible Ego, which latter Kant declared to be our real

transphenomenal being subsisting beyond space and time appearances, and therefore exempt from space and time limitations; this speculative notion of a supernatural moral Self inspired Fichte — rather consistently from the idealistic standpoint — to conceive this timeless and spaceless volitionally empowered Ego, Will, or Reason, to be by force of its free causative efficiency and self-positing *actus purus* the all-creating principle of the universe. And he declared it to be rationally striving to realize by means of its free activity a perfect moral order of existence.

From the assumption of a primordial, transphenomenal, nature-creating Will, held to constitute the real Self of the multitude of transient forms of life phenomenally appearing in time and space, Schopenhauer, on the other hand, more rationally than Kant and Fichte, adjudged the primordial Will thus posited to possess an irrational and immoral character. For it could have been only an unaccountable craze, or worse, that induced it to break through its eternal nirvanic repose, in order to exteriorize and disperse its all-sufficient, plenary nature into countless, blindly striving, ever-suffering and perishing individuated units.

It must be confessed that the consistent outcome of hypostasizing an all-efficient creative Will, or the consistent outcome of any creed which presupposes a state of original perfection, from which nature, and especially man, has strayed or fallen; that the rational outcome of such a seriously supposed state of things has ever been more or less pronounced Pessimism, as again taught in our time by Schopenhauer. Such Pessimism involves as the essential tenet of its ethics ascetic withdrawal from the allurements of this transitory world, and striving through their renouncement, as-

sisted by supernatural aid, to be delivered from all worldly or so-called "sinful" desires, and from all consequent strife, suffering, and precariousness of this illusive and deceptive existence, hoping thereby to regain the lost state of pristine bliss in the realm of eternal beatitude.

It is indeed no wonder that in the presence of so many untoward threatening dangers and disasters, and witnessing the ruthless sway of the strong over the weak; that cowering under the overwhelming might of nature's dread catastrophes, expecting at any moment to have to encounter the ferocious onslaught of prowling beasts, and, worse still, to become the victim of fiendish tortures inflicted by hostile men; it is no wonder that in the presence of this dire content of precarious life, when at last in the dawn of arising ethical conscience the recognition of the innate kinship of man to man began to stay the pitiless warfare between human brethren in their savage struggle for existence and their satisfaction of animal cravings; it was natural then that commiseration for the hard lot of needy man sprang up in compassionate hearts. And it was natural that it caused their bearers to turn away in horror and contrition from a world where carnage and lust ran riot; to turn away from it and take refuge in the hope and faith that in a celestial home, penitently gained, lovingkindness will reign supreme, or at least all strife be forever quenched in blissful quietude. The world over, wherever social conscience became intensely awakened, it has culminated in the inculcation of ascetic ethics, urged thereto in open view of the preponderance of evil over good, when measured by a standard of some fancied ideal perfection, firmly believed in as somewhere existing and passionately longed for.

But abstracting from ideal perfection fancied to preëxist somewhere, it is evident that here on earth the kind of conduct that is designated as moral or ethical, and recognized as such in its aims and by its doings, is something quite different from, nay, quite opposite to, the conduct urged by ascetic ethics. It is something emanating solely from human beings as exercised by them in social communion with one another during their lifetime, and applying wholly to their existence here on earth. When the conduct of a member of a community is said to be morally right or good it is essentially meant thereby that he has acted morally towards his neighbors and towards the community at large. And when his actions are said to be wrong or bad they are condemned essentially on account of their injurious effects upon neighbors and the community. It is always the welfare of the community and the well-being of its members that are implicated in what is looked upon as right or wrong conduct in social life. Moral conduct towards fellow-beings is rightly judged by social actions, not by verbal professions and ritual observances.

Of course, moral commendation and condemnation of human actions do not in the least explain how it happens that a certain standard of morality has become established in a community. And it remains still more obscure how it comes about that starting, let us say, from a state of savagery or barbarism, in which state right and wrong have mostly no moral meaning whatever, and especially not with regard to conduct towards members of other communities, it remains obscure how it has come about that, despite the innate savage and barbarous propensities of the uncivilized human animal, there has arisen with the progress of social culture in

certain individuals more mindful than others a sense of right and wrong behavior towards "neighbors," with the conviction that human beings, such at least as belong to the same community, ought to treat one another as "brethren," recognizing that they all partake of the same human nature, are all striving for satisfaction of the same needs, and are, furthermore, longing to share in whatever social development has contributed towards human progress and happiness.

Human beings, it need hardly be said, are nowise as formerly believed, and as still insisted upon by transcendentalists, a peculiar order of creatures originally endowed with a special faculty called "reason," which intuitively reveals to them what is right and what is wrong, and impels them to conduct themselves morally. And still less are they, as many yet profess, a race of beings at first without sin and knowing only happiness, that have become morally depraved through commitment of the unpardonable sin of disobedience to the explicit command of a supreme being on the part of the original progenitors; a race of creatures remaining in consequence ever since a fallen race without power of its own to morally redeem itself. It is, in fact, rationally consistent, when a state of original perfection is assumed, to infer that only a guilty act somewhere committed could have caused a falling from a state of complete satisfaction precipitantly down into a world where attack and defense, need, suffering, and death inevitably prevail. Taking, then, for granted that irredeemable depravity is the lot of the human race, such a lot would render social existence utterly impossible, and involve a war of all against all without a social contract being entered into as Hobbes and others maintained. Or, as more generally accepted, this antisocial

state would exist without the enunciation of a number of moral commandments emanating from the same supreme being who punished us so severely for the disobedience of our original progenitors; commandments enjoined under the threat of still severer punishment for disobeying them. It is certain under all aspects that without obedience to moral injunctions no mode of cultured social existence would be possible. But it is obvious also that mere obedience to promulgated commandments has in itself no genuine moral value. The moral value of an act has consequently to be sought in far more valid and recondite conditions.

Howsoever beneficent the religious fiction of the origin and promulgation of moral injunctions has hitherto proved to ethically undeveloped and unprincipled man, anthropological study, and indeed the positively ascertained fact of gradual step by step development of all living forms, with all their physical and psychical faculties; these positive results of biological research have rendered certain that men, being constitutionally and primarily mere social animals, have only by slow degrees advanced, and are still only gradually advancing, some more, some less, towards rational and ethical humanization. From a purely instinctive beginning of altruistic propensities, originally arising as an organic acquisition from the sexual and parental superindividual relation, these have in keeping with the development of social culture expanded over more and more numerous associations of human beings, at first closely inter-related by bonds of consanguinity, spreading then over more distantly related groups brought together by common interests.

It will not be denied by scientifically trained thinkers that a more correct and profound insight into the ways

of creation, principally gained through biological research, has of late completely reversed the direction of human hope and faith with regard to fulfillment of religious longings and ethical aspirations. For it has become certain that the ascent from lower to higher forms of life has been achieved through incessant vital toil and strife, every advance being gained by victory over surrounding perils, and by merciless attacks and defenses of every occupied position. What may be called the creative sanction, the inscrutable formative power which affirms and fixes through developmental increments of organic constitution each progressive step howsoever ruthlessly won, this formative sanction of the creative stress has accrued wholly irrespective of ethical means, nay, by what we must now regard as highly unethical processes. It structurally ratified the vital toil in whatever direction it might be exerted all along the endless stretch of eons of time, until at last, amid numberless deviations, it developed in social man, its highest achievement here on earth, rational insight and ethical sentiments, which with increasing urgency influenced his conduct towards his human kindred and associates in progressively widening circles of intercommunication.

The social instinct of animals and the social consciousness of man are, like all vitally attained acquisitions, organized faculties embodied in what is perceptually revealed as specifically constituted vital structure. These structurally organized faculties have been creatively elaborated before conscious volitional control and choice came to impart to them discriminative direction in relation to the growing complexity of nature as sense-revealed, and as freighted with cumulatively increasing knowledge bearing with it the memorized

cognition of the multifold diverse effects of the outside world upon human welfare. Eventually in man volitional control over his executive organs enabled him to regulate his conduct in relation to the widely comprehensive complex of his cognitively memorized experience as consciously presented in his moment of actual awareness. We human beings become thus empowered to choose among the many offered possibilities the best suited ways and means which according to memorized experience will lead to the realization of our special volitional intentions. In case these intentions prove to be in their execution conducive to further our individual and social welfare, then such beneficent discriminative actuation on our part constitutes our more or less rational and ethical behavior in life. The choice of means and the direction of volitional execution occur within ourselves among the manifold presentations of our memorized experience. The execution is realized outside ourselves among the extra-conscious existents of the world at large.

An action to be rational has to bear the character of volitional intention and cognitive discrimination. Reflex, instinctive and automatic actions, due to structurally fixed modes of actuation with regard to definite needs prearranged to be satisfied by specifically given objects; or actuation due to firmly established modes of reaction in response to definite modes of incitement; howsoever conducive they may be to the welfare of the acting individual and to that of its race, such strictly predetermined actions cannot properly be regarded as rational. Rational conduct is altogether dependent on the organic detachment of means of volitional actuation from generically preceding modes of automatic actuation, and concomitantly

dependent also on organically memorized and conceptually systematized experience generically and individually gathered in the course of time, and brought to a cognitive focus for guidance of conduct in our moment of actual awareness. Reason is nowise a universal, reality-constituting principle as maintained by transcendental Idealism. Without an accumulated fund of organically memorized experience applying to our life of outside relations, and gained in interaction with the same, reason could no more exist in men than in lower animals. The strict interdependence of reason and educationally acquired speech is in itself sufficient proof of it. Reasoning is an activity exercised by the living being upon material of his gathered memorized experience consciously presented in actual awareness. It consists simply in unraveling memorized, generalized, and systematized experience, deducing from it analytical propositions or judgments.

This conscious material of rational thought and conduct is, however, not, as Kant believed, merely sense-given raw material. The sense-affecting influences of the outside world arouse within us into actual awareness a generically and individually preëstablished and perceptually and conceptually systematized conscious representation of an extra-conscious world, whence the sense-stimulating influences emanate. This inwardly established microcosmic representation of the real extra-conscious world constitutes the immediate conscious environment in which and by means of which conscious life is carried on. Rational determination of a course we intend to pursue in real life and the possibility of its actual performance are strictly conditioned, first upon a fund of memorized experience consciously offered for choice of ways and means in

actual awareness, and second upon the volitional control of our executive organs guided in their action by the memorized consciousness of the chosen path.

Ethical considerations of a hedonic or pleasure-giving character in relation to our fellow-men enter into rational conduct when deference to their reciprocal human rights and furtherance of their human well-being become recognized and felt demands of sympathy and justice, and when these demands are affectively and volitionally complied with. Each individual is by inheritance a representative of the wealth and worth of human existence, an inheritance toilsomely elaborated within his organic being. And until he disgraces his human nature he has to be treated in accordance with the super-individual worth he embodies.

Determinists maintain that the human individual is innately endowed with a definitely established complex of "volitional" dispositions, which constitute his given character, and which are respectively and specifically adapted to conditions of a definitely given environment. Under incitement by certain presented or imagined objects or circumstances of craving or desire at the time being a definite action is said to be of necessity elicited. Or, in case more than one object or circumstance are urging together the activity of the same kind of volitional propensity, or if different kinds of such, then the most powerful conjunction of present desire and of apprehended object of satisfaction is held to elicit with necessity the present action. Such combination of strongest desire with incitement by the most suitable object of satisfaction is called the most powerful "motive" to action, which among all competitors is in consequence certain to succeed in determining the action.

Such a determinist conception of "volitional" activity suits pretty well a stage of animal existence before volitional activity has become organically detached from mere automatic modes of actuation, and before an accumulated fund of memorized experience is placed for choice and guidance of conduct at the disposal of the acting individual in each moment of his present awareness. The decisive characteristics of genuine voluntary efficiency are the power to inhibit actions which otherwise would automatically occur, the power also to consciously assist actions that are taking their preestablished habitual course, and above all the power to initiate and direct movements so as to attain definite ends consciously forecast, but not necessitated by structural arrangements, not being mere necessitated motor actions and reactions in answer to definite modes of organic cravings stimulated by presentation of their definite objects of satisfaction. Genuine volitional conduct is vastly more complex and far more profoundly rooted in organized acquisitions than is generally supposed by determinist ways of interpretation. To become aware of this we need only consider the superficial and transient nature of actual sensorial stimulation, which alone directly reveals to us the presence and perceptible characteristics of the existents of the outside world as they affect our specific organic sensibilities. Genuine volitional conduct applies to a world transcending in its completeness and signification altogether the limits of what simultaneously appears in time and space as actually given; a world constructed of multifold scattered inner and outer experience that has become memorized, systematized, and unified, and is being as such comprehended by means of intricately involuted

signs in our present moment of awareness. All the wealth and progressive results achieved within ourself and in the world at large in the course of endless time and all that fills space here on earth and immeasurably beyond, though ever so far out of reach and out of present sight, all effects on our well-being caused by external influences and arousing our emotional sensibilities; all this widely comprehensive, memory-constituted world forms the ideally transfigured and yet reality-representing domain within whose all-comprising enlightenment genuine volition shapes comprehensive schemes of action, and seeks to realize them in the more or less plastic material of the real extra-conscious world, to which the individual bearer and wielder of the stupendous all-comprising, all-revealing conscious content himself wholly belongs, as the most essential factor of this terrestrial phase of creative vital achievement.

To add to the scope of our volitional control of our conduct as pursued in the light of systematized and synthetized experience, it lies in our power by force of concentrating our attention upon definite percepts coming within our ken, and upon definite thoughts spontaneously arising or artificially made to arise in our conscious content; it lies in our power by this means, and especially under sufficient training, to determine to an essential extent the sequence into consciousness of a definite train of interrelated ideas or thoughts fit to serve as guidance in the pursuit of a definite volitional aim among a maze of other offered possibilities.

The freedom of volitional conduct here scientifically vindicated is the freedom by means of voluntary movements, to which those of attention likewise

belong, to pursue among many remembered possibilities a certain course towards the attainment of a mentally predetermined aim. Of course, the intended aim to be reached, in order to be rational and attainable, must lie within the compass of human capacity in general and of individual capacity in particular, and it must correspond to conditions actually obtaining in extra-conscious nature. Fanciful aims, not realizable in extra-conscious nature, are mere air-castles. If these are seriously believed to be nevertheless realizable, they may lead and have often led to atrociously irrational and unethical indulgence of volitional activities in life-perverting pursuits. More or less noxious are all manner of superstitious or fanciful beliefs. Only actual experience, practically and scientifically verified, can teach us what volitional aims are realizable in the creative sphere of real extra-conscious existence.

The possible abilities inherent in human nature are a definitely given and positively determined complex of endowments possessed in degrees and combinations varying constitutionally in each individual, and at different periods of his life and of his gathered experience, but fixed as a whole at the moment of each separate action. And the constitutionally determined sphere of individually attainable aims at the time being is strictly circumscribed by the nature and extent, not of what exists in the outside environment, but by the nature and extent of the experience that has become organically memorized within the living being. There are numberless gradations between the promptings to action and the sphere of desires connected with the animal nature of man on the one hand, contrasted, on the other hand, with the promptings to action and the

sphere of desires of man when he has become humanized through social and ethical culture. It is, however, of the utmost importance to recognize that the process of real humanization of the social animal called man is essentially one of most gradual organic elaboration, of just the same kind of creative elaboration that has originally differentiated him from the lower animals. It is, therefore, a fatal mistake to trust to the still prevalent presumption that has led, and is still leading, to grievous results, the presumption, namely, that a savage — to take an extreme example — can through education during his lifetime be transformed, not only into a well-trained higher kind of animal, but into a socially and ethically cultured being. Such transformation is, however, successively accomplished even in deaf and blind children that have inherited the organized dispositions of a race advanced in the process of humanization. It is tragic that not even the most benevolent treatment of races, that have become stagnantly adapted to a lower state of social existence, can avert their final elimination, when forced into competition in the struggle for existence with higher developed races. The inherited inferior organization cannot possibly become developmentally adapted to the highly complex social environment of cultured life, established during long ages of definite previous elaboration. When we consider what comparatively small progress has been made by the highest developed races in converting the great majority of their own social members into conducting themselves of their own free will out of sincere conviction in a truly rational and ethical manner, such as is accepted to be right and incumbent upon them in the stage of culture attained in the community to which they belong; when we consider this

tardy progress in real humanization among the most advanced races, it is obvious how futile must be the attempt to organically and culturally develop a race low in the scale of human progress into a high one in only a few generations. Of the truth of this biological statement there is to be found abundant actual demonstration, whose lessons should be well heeded by statesmen and educators that have to deal with such inferior races. It is generally presupposed that any being appearing in human shape is right away potentially endowed with all the faculties of highly cultured man, which faculties need only to be educationally actualized in him. This chiefly religious prejudice is being everywhere in practice sadly upset. And most difficult of all to be organically and functionally developed are the moral faculties.

In dealing with their own race statesmen and educators should ever bear in mind that the character of the social environment of which the established rational and ethical convictions are the most essential components; that this environment of cultured achievements and ethical convictions constitutes the preëminently efficient factor in the humanizing process of the members of the community or nation. Hence the extreme difficulty of the task incumbent on a true democracy, the task to contrive so far as feasible that equal justice in treatment and opportunities be done to every citizen, and to strive by all possible means to raise them all to a high level of rational and ethical conduct, and of cultured life. The full success of the democratic aim is, however, thwarted to a considerable extent by unavoidable inequalities of different kinds, of which inequalities of natural endowments and of ethical dispositions and conduct are the most formidable. Access to the ad-

vantages yielded by a cultured environment, and, above all, a high ethical standard upheld in social life in general, are the most promising means to secure the success of democratic institutions. Deprive a child simply of the advantages gained by the possession of a cultured language, and its reasoning faculties will necessarily remain deficient. It will grow up into a rationally and ethically deficient being and citizen. A linguistically uneducated deaf and dumb person, to take an extreme instance, can hardly be called a humanized being. The learning of linguistic signs and what they in reality signify is that which chiefly fits individuals to participate in the blessings of cultured life. But ethically deficient will remain an individual deprived of an environment of ethical convictions and examples that will arouse his potential ethical disposition to practical activity.

Man becomes a humanized being in measure as he organically and educationally participates in the achievements of social culture. Children socially isolated and growing up untaught remain in a state of semi-imbecility. An idiot, on account of his deficient organization, cannot rightly be considered a humanized being, obviously for the same reason, or rather for the same cause, that a chimpanzee is not and cannot become a humanized being. Humanization strictly depends on degrees of attained structural brain-organization and on appropriate social surroundings. A deaf and blind child that remains linguistically untaught is still more completely debarred from participating in rational and ethical culture than a mere deaf child. In consequence it abides necessarily in a state of almost complete animality, despite its heritage of highly developed organization embodying potential humanized

faculties. The awakening touch of the influences of the environment to which the social nature of the child has been generically adapted is imperatively required to actualize its potential faculties. Nothing intervening from beyond this definite sphere of established inner and outer conditions can possibly substitute itself for them. Appropriate linguistic education through nothing but the sense of touch will accomplish this wonderful result of rational and ethical awakening that no other means can effect.

To a correct understanding of the real conditions that conspire to constitute human nature it is essential to recognize that individual man owes his rational and ethical propensities, nay, his entire rational and ethical constitution, to the humanizing influences of social culture. It has been attained through progressive organization of the faculties that underlie rational and ethical conduct. The principal pregnant conclusion to be drawn from the biological facts here brought forward is, that what we actually know as a human person, be he ever so highly developed in everything that ennobles human nature; that such a person is scientifically unthinkable as a self-rounded unit or self-sufficient individuated totality, whose existence when severed in thought and action from his social environment can possibly retain any kind of significance. This conclusion is scientifically fully justified, and cannot be subverted by any sort of egotistical pretensions. Human nature forms indissolubly an integrant though individuated and most highly developed part of its vital and social environment.

Hedonic ethics aiming at the present well-being of individual fellow-men, although it constitutes the proximate expression of awakened ethical conscience, is by

no means its sole ethical end, as has been strenuously maintained by hedonic moralists. Higher demands are imposed on our ethical conscience by the recognition that all the concentrated wealth and worth of conscious organic existence, laboriously gained by ages upon ages of creative travail; that this entire organized wealth and worth of body and mind is bequeathed as a most precious heritage to the individuals of the generation actually alive in this present span of time; the generation that is forming the sole link between the endless procession of past and of coming generations. The human individual finds himself thus destined to be the bearer, trustee, and transmitter of the highest achievement wrought here on earth by whatever underlies creative activity. On recognition and appreciation of this trans-individual mission, and of the vastly super-individual character and import of his own personality, man ought by rights to feel bound by the commanding and solemn significance of such insight, upon conformity to whose guidance the future welfare and progress of humanity at large depend; he ought to feel rationally and ethically compelled to acknowledge that demands of a higher order than those of mere hedonic satisfaction of present individual and social desires are therewith imperatively imposed upon his moral conscience. These demands clearly enjoin him not in any manner to degrade the high-wrought worth and dignity of his inherited humanized nature; to defend at all individual risks the general rights and possessions of the socially and ethically cultured community and nation to which he belongs, and to which he owes all that constitutes him a humanized being; and he cannot rationally fail to recognize the duty conscientiously to strive to further the humanizing development of his race, and to trans-

mit his own humanized nature enhanced, if possible, but at least not deteriorated, to posterity.

Upon ethically developed persons moral duties and responsibilities are not imposed as commandments emanating from some source external to themselves, obliging them to obey, as children are obliged to obey the commands of their parents, without questioning, reasoning, and ethical conviction, or obliging them to obey as ethically uncultured persons are made to obey legal and ethical injunctions for fear of social and religious punishment or hope of reward. Ethical injunctions have their veritable origin in biologically ascertained facts and processes whose significance has become in the course of organic development to be rationally recognized. In this manner it has become, for instance, a recognized positive biological truth, that the pleasurable satisfaction of organic cravings and dispositions, such as hunger and sex; the pleasant effect of warmth, of rest, and sleep, of companionship and divertisement; that the enjoyment of the satisfaction of organic needs is no final end in itself, but subserves the higher purpose of individual and race preservation, and furthermore most essentially the still higher purpose of progressive organic elaboration, or, at least, of organic elaboration in whatever adaptive direction the organic being is placed with regard to a specifically given environment. Animals have become thus organically adapted through and through to the special environment within whose sphere they are found to carry on their existence.

In watching the actions of animals it would appear that the almost exclusive aim of their doings is to satisfy the cravings of hunger and sex, and that their life of outside sensory and motor relations is altogether sub-

servient to this end. Their essential pleasures and pains seem to be the direct outcome of their success or failure in satisfying these appetitive cravings. And their accidental pains, moreover, principally result from satisfying the hunger, or from inciting the jealousy of other animals. Under this seemingly justified aspect of animal existence their organism with its vital activities seems to consist, on the one hand, of internal organs and functions in which are embodied the appetitive cravings with their accompanying passions, whose satisfaction constitutes then the essential object of life. And, on the other hand, it seems to consist of organs that bring the animal in direct interaction with the outside world: sensory organs, muscular apparatuses, and neural structures. These would then exclusively subserve the intrinsic cravings and passions by supplying them with means of satisfaction.

This rather plausible view of the subserviency of the organs of the life of outside relations in obviously ministering to the life of intrinsic cravings and passions; organs apparently formed exclusively and in manifold cunning ways for procuring what is wanted to satisfy the appetites embodied in the internal organs; this view, justified as it would seem by what is actually observed, is that explicitly adopted from an anatomical and physiological standpoint by the eminent biologist Bichat, and from a philosophical standpoint by the pessimistic philosopher Schopenhauer. They applied it with many sound arguments not only to what are more particularly called animals, but preëminently also to the special animal of the genus *homo*. It is clear that if the *raison d'être* of the sentient and conscious life of animals, man included, really consisted merely in helping to procure pleasurable feelings experienced

in the satisfaction of appetitive cravings, and if the living organism existed really and principally for the sake of sensual enjoyment, life for rational and ethical beings would not be worth living, and ascetic ethics as actually inculcated by the religion of contemplative nations would afford the proper rational guidance for human conduct to follow.

As Schopenhauer rightly teaches from what might biologically be called the entodermic or inside point of view, in contrast to the ectodermic or outside point of view, namely, that the awakening in exceptionally gifted individuals of rational insight into the ruthless ways and means of creative Will, as lust-propelled it is madly striving for sensual gratifications; that this awakened rational and ethical insight on the part of man's intellect, when abnormally developed it has succeeded in emancipating itself from merely subserving, the demands of animal appetites, and has recognized the fundamental wickedness of the Will's creative ways; that this enlightenment disclosing the essential vileness of life cannot fail to make man feel strangely out of harmony with normal animal nature as here on earth displayed.

If this entodermic view expressed the real state of things, then, indeed, better by far to refuse being any longer entangled in such a bootless whirl of "sinful" greed and lust, and by renouncing its allurements, and withdrawing altogether from it, to abandon the entire loathsome turmoil to animal rapacity, for which alone it is thus fit. Or, perchance, to bring by such ascetic conduct to reason the distracted Will itself, so that repenting its guilty doings and desires it may desist from its baneful rush into what proves to be but a scrimmage of suffering and perishing existences, and induce it to

reënter, itself converted, into its pristine nirvanic repose.

Such pessimistic view of life, expressed in various figurative ways, forms the essence of the still professed creeds of the most cultured nations of the present time; creeds, however, practically ignored in the performances of real life. It cannot be too emphatically insisted upon that this life-denouncing creed is founded on a complete misconception of human nature. For man's highly developed nature having started from low beginnings of purely animal existence represents at present the manifest embodiment of the most exalted achievement wrought by the creative powers, that during toilsome eons have fashioned the multifarious constituents of this life-teeming globe out of what is scientifically revealed as simplest elementary stuff.

The present writer considers it one of the most enlightening results of his biological researches to have positively shown that from the very start of vital activity, as distinctly observable in primitive forms of life, the ectodermic functions, which carry on the life of outside relations, instead of being essentially subservient to the inner entodermic life, the very reverse is really the case. The essential function of the entodermic or inside life consists in the preparation of assimilable complemental material suited for reintegration of the functionally disintegrated organs of the ectodermic or outside life, through whose interaction with the environment progressive organic elaboration, and all educational results are in fact attained. No thoughtful biologist, nay, no common-sense observer, can nowadays fail to recognize that the potential seat of conscious memory, the local habitation where is preserved in latency all we have learned through casual experi-

ence, and through systematic teaching, and from whose sense-hidden potency emanates into present awareness the entire content of what we become actually conscious of; that the real seat and source of emanation of the entire world of consciousness is to be found in what is perceptually revealed as the brain and its marvelously organized structure.

Whatever density of traditional prejudices, and mazes of epistemological difficulties, may theoretically obscure and bewilder this plain common sense and biological conclusion, it is abundantly justified by manifold actual experience, and by biologically ascertained facts. Intuitively our educational methods are in consequence founded upon intentionally directed modifications of the structures that underlie conscious memory, and that potentially harbor it in unconscious latency. The practicing of a feat of memory until it has become secondarily automatic differs in no essential manner from the practicing of a feat of muscular skill until it has become secondarily automatic. In both instances it is an abiding modification of preëxisting efficient vital structure that has been effected. Without such actually elaborated modification of preëxisting efficient structure neither the motor nor the conscious feat could have resulted as something newly developed, newly come into existence. The developmental accretion is a creation of something not previously existing; but it is wrought upon a vital matrix previously creatively elaborated. A conscious feat emanating from no underlying perceptible structure is just as unthinkable to a scientist as a motor feat accomplished without underlying perceptible structure. An inevitable inference from it is, that progress in conscious awareness can only be attained by developmental elaboration

of what is perceptually revealed as brain-structure, just as progress in motor abilities can only be attained by developmental elaboration of the structures from whose functional activities they proceed, neural structures being here likewise implicated. The living substance that constitutes brain-structure is a developmental outcome of the same sensori-motor living substance that constitutes muscular structure. In neural substance the sensory character predominates, in muscular substance the motor character. In neural structure the motor activity is of a "molecular" kind, in muscular structure it results in a molar outcome. The two differentiated structures remain, however, in functional continuity.

In placing in a parallel a conscious state with a motion a similar objection may be raised, as can rightly be raised to the placing in a parallel the "secretion of the thoughts from the brain" to the "secretion of bile from the liver." The placing in equivalent juxtaposition conscious states and muscular movements has to be epistemologically justified. A perceived movement turns out to be itself but a conscious sign aroused in outside observers and signifying a functional activity of the extra-conscious existent here perceptually revealed as muscular or motor apparatus. And so is a conscious state directly arising in the subject who experiences it a functional outcome of the activity of the extra-conscious existent perceptually revealed as brain-structure. What appears here as motor to outsiders, appears as a conscious state to the functioning subject.

From the important biological truth just elucidated it follows, that all progress in conscious awareness and all progress in muscular abilities, have from the very beginning of the vital activity of the sensori-motor

living substance been attained through structural elaboration, and that, consequently, no conscious awareness of any kind, whether conative, affective, or cognitive, and no display of muscular abilities, can ever have existed in the past, or can ever exist in the future, detached from their manifest, specifically elaborated structure.

The recognition of this real state of things, as biologically disclosed, is, of course, of utmost importance in the conduct of life. Although subversive of cherished traditional beliefs, it opens an insight into our real nature, and points out the right course that leads to progressive humanization.

What is perceived as brain-structure, a structure kept organically and functionally intact by a vortex of constant vital activity, and revealed to visual consciousness by means of nothing but "ether vibrations" arousing it in specific ways; this symbolically light-revealed, extra-conscious, culminating constituent of our being is incontestably an achieved generical result of most gradual elaboration, wrought through vital interaction with the medium, to whose diverse modes of incitement its own functional reactions significantly respond in the form of conscious states. These conscious states have obviously no other significance than to render the living being aware of his organically ingrained modes of interrelation with that which constitutes its real extra-conscious environment, so that they may serve him as guidance in his manifold interactions with the same. This organically developed brain-structure, which underlies as potential matrix the systematized dispositions of our established modes of conscious interrelation with the environment; this potential matrix of consciousness we individually in-

herit ready-made with the rest of our concomitantly developed organization.

Post-natal experience gained in living interaction with the same environment to which the organism has been generically more or less adapted, such individual experience, so far as it merely repeats previously firmly established and organically embodied racial experience, consists simply in the actualizing, through corresponding modes of external incitement, of what is already preëxisting. The truth of this biological assertion is clearly evidenced in the purely instinctive activities of animals that issue organically ready-made into living interaction with the special medium within which they have to carry on their life. All their predisposed vital activities that make up their life-history, and all the predisposed reactive responses of their sensori-motor organism are simply set going or touched off by appropriate external incitements to which they have been organically adapted. This is clearly so with firmly established racial experience as organically fixed in fundamental modes of interrelation of the organism with its medium, as, for instance, in the breathing of the new-born infant on contact with air, or in its sucking on contact with the breast; or as seen in gallinaceous birds and other animals on exit from their eggs or at birth with regard to almost all their interactions with the medium, and still more completely and strikingly in insects whose organization has become so thoroughly preinformed through racial development of what is going to happen to them and through them during their lifetime in contact with their appointed medium, that nothing more has to be learned by them in actual intercommunication.

Post-natal experience accruing to individuals not

organically ready-made at birth, and who are not merely exactly repeating definitely established racial experience, this new experience can only be latently memorized and potentially preserved or retained through definite modification of the structure of the preserving matrix, by which it is received, upon which it is impressed, and in which it becomes incorporated with more or less stable retention. Frequent repetition as actually occurs in the course of life, and as is intentionally made use of in systematic training, fixes more firmly the accruing modifications of the receiving matrix, and imparts retentive stability to the new experience.

Presuppose as fully established the latently organized memory of all that can be experienced in a life-time, and particularly the memorized store of knowledge acquired by a highly educated scholar, and what more do the Fichtes, Schellings, and Hegels need, what more all conceptualist thinkers, what more all manner of idealists, than this accumulated fund of memorized experience, in order to fabricate, evolve, or spin out from such all-containing store their fanciful world constructions; palming them off, then, upon themselves and their disciples as really objectively subsisting in some transcendent sphere as the eternal content of a universal potency, substance, will, reason, or intellect? Or what more is needed to find sufficient material to construct their airy world out of this or that kind of conscious states, assumed for the purpose to possess permanency of existence, unsupported by any perceptible organic matrix? Here in these perceptual and conceptual world-constructions the all-important epistemological problem is simply ignored, while its correct solution alone can account for the true significance and

the realistic implications of what phenomenally and transiently appears in our conscious content. Without previous experience gradually acquired through direct interaction with the sense-affecting external existents, and wielded by means of educationally imparted linguistic signs, there could arise in our conscious content nothing of rational cognitive significance. Surely the world we know can nowise be conjured into existence simply by force of "productive imagination" or "intellectual intuition" as idealistic philosophers contend. Nothing but sense-revealed and sense-aroused experience, gathered in direct contact and interaction with the real world of extra-conscious existents, can furnish consciousness with cognitive material. Such material has, however, itself no substantial existence, and gains its significance only as referring to the world of extra-conscious subsistence from which it is representatively derived.

Imagine that from the summit of a high mountain you are surveying a vast landscape stretched out before you, and though on the whole it is something new to you, it consists of numberless well-known objects, such as villages including many houses and living beings, forests with a multitude of different kinds of trees, and fields with all manner of growing crops. Now where has this actually perceived landscape with all its manifold content its permanent existence? Your sight is directly affected by nothing but an intricate complex of "ether vibrations" which visually arouse in you a corresponding complex of shaded and colored forms. This is all you directly see. Evidently these mere visual forms do not constitute the real landscape. By closing your eyes it vanishes altogether out of existence. Nor can the real landscape possibly be consti-

tuted by the complex of "ether vibrations" that alone affects you from outside. Where, then, can the landscape you are at present actually aware of, with all its well-known constituent objects really exist? As forming part of your individual conscious content it obviously exists nowhere but in your actualized potential memory, which reproduces representatively what you have previously experienced during your lifetime in direct living interaction with the extra-conscious existents that through sensorial modes of incitement have revealed to you their actual presence and differentiating characteristics, together with their import for weal and woe to your own extra-conscious being, and to that of your fellow men.

Without this previous experience which has gradually accrued through direct interaction with the sense-affecting external influences, and which has become structurally fixed and systematized in your organic being; preserved there as potential memory, which on being actualized alone imparts significance to the shaded and colored forms of your vision; without this potential background of memorized experience there could exist no such landscape as you actually perceive and cognize. And despite unimpaired vision you could no more evolve it from pure intellectual intuition than a blind person in presence of it. The landscape you actually perceive, and whose constituent objects you recognize in all their known bearings upon yourself and upon one another, consists, then, altogether of modes of your own potential memory at present functionally actualized. And it symbolically represents in fleeting modes of awareness a permanent world of inter-related extra-conscious existents, which constitute the environment to which you have been organically

adapted, and in interaction with which your life-history unwinds itself. Clearly the shaded and colored forms which visually compose the landscape you actually see would signify nothing to you, unless from the gathered fund of your latent memorized experience, acquired by your manifold modes of interaction with the real extra-conscious existents visually represented, were not concomitantly aroused so as to form part of your present conscious content, and to impart to the visual forms their true significance. Some of these forms signify real houses built to live in; others real trees suited for manifold uses; others certain plants cultivated for different purposes; others again human beings socially related to us and to be ethically treated. And to us humanized beings social and ethical culture supplies here the most valuable significance to the perceived objects, which to our mere animal nature would mean only objects either suitable or unsuitable to satisfy our appetitive needs; objects to be either sought or avoided solely on this account.

The actual concurrence of that which is cognitively present in conscious awareness, the concurrence with its signified complement in real extra-conscious existence, is wholly a matter of preëstablished harmony creatively achieved through organized adaptation, inclusive of memorized experience, generically ingrained in the organism through its living interaction with the sense-affecting influences of the environment. And it is the continued interaction with the same influences of the outside world that sustains and develops the inherited organization and all the functional activities of the individual. Without reference to a signalized world of extra-conscious existents the all-revealing conscious content would have no meaning whatever.

In the same way, without reference to our social life carried on amid fellow-beings like ourself, our ethical consciousness would lose its entire significance, would, in fact, be non-existent. I see a friend coming towards me. This conscious phenomenon consists directly of nothing but a moving visual form. It is relevant to ask: What real significance could this mere visual form have if it were not concurring with a real extra-conscious being signalized thereby? And how could the "ether vibrations" that arouse in me this specific vision reveal the real presence and characteristics of my friend if not through preëstablished harmony between the external stimulation and the corresponding organic reaction or response resulting in my definite perceptual vision? And how could I be aware of my friend's outer and inner characteristics if not through memorized experience of my actual former intercourse with him? And how could my friend and I be really existing as organic beings understanding each other by means of mere acquired linguistic signs, if not organically and socially developed in interaction with the same physical and psychical environment, and having both inherited a humanized constitution that has been creatively wrought to its present state of efficiency through progressive increments of organic elaboration?

A dream consisting of nothing but mind-stuff may, indeed, mimic all the experience of waking life, and even combine it in fantastic ways of its own. But without previous vital interaction with the real existents of the outside world, perceptible and tangible by all normal human beings, without the memorized experience gained by such interaction, and principally without the organic matrix harboring it all, and issuing it more or less rationally systematized into actual

awareness, no dream, and no other kind of conscious display could bear with it any kind of cognitive or affective significance. The social and ethical consciousness that plays its part in dreams originates just as much in social and ethical experience gathered in actual life, and having become potentially memorized, than any other constituent of our conscious content. They all originate in no other way than in actual living experience through interaction with the extra-conscious existents signalized and signified by them. Our inherited potential dispositions, inclusive of rational and ethical propensities, organically ingrained in our vital constitution have, in order to become actualized, to be brought in direct living interaction with the corresponding stimulating influences. Without air no breathing and no hearing; without radiant energy no warmth and no vision; without complexity of affective and cognitive influences, whose manifold effects upon the organism have been consciously memorized and linguistically designated, no rational conduct; and without social and linguistic intercourse with fellow-beings no ethical conscience, no ethics of any sort.

Our rational and ethical propensities are not transcendently derived as a foreign influx from some supernatural, noumenal, or intelligible source. They are entirely inbred in our humanized nature. Like all our vital possessions they are gradually developed organic acquisitions, potentially subsisting in what is perceptually revealed as specific vital structure. From this vital matrix alone they become functionally operative in real life when appropriately actualized. Let the structural matrix undergo deterioration, and in keeping with it will rational and ethical consciousness deteriorate. Let it altogether cease to function, and with it

rational and ethical consciousness and conduct have ceased to exist. This positive fact alone outweighs all arguments to the contrary put forward by reasoners whose own underlying brain-structure is sound and alive.

An inscrutable creative stress, manifestly tending towards higher development, renders vital activity progressively fruitful, and has as its highest result here on earth partly succeeded in achieving the rational and ethical humanization of animal nature. Hunger, carrying with it such tremendous practical consequences into life, is, rightly viewed, only a conscious sign of the need for functional reintegration on the part of the ectodermic organs. And so likewise is sleepiness, the most insistent appetitive craving, a mere conscious sign for the need of complete restoration to functional integrity on the part of the entire life of outside relations as a unitary whole. This is effected, and felt to be effected in sleep during suspended functional activity of the ectodermic organs. In significant contrast to it the functions of the entodermic life continue meanwhile sleeplessly their own activity, in order to supply uninterruptedly the ectodermic organs with appropriate restitutive material. As regards the craving of the sexual appetite, it is also a complementary need instinctively ingrained in the respective sensori-motor complementary organisms, as perceptually manifest in the contrast of male and female organization. And just as the craving of hunger subserves essentially the preservative integration of the individual, so does the craving of sex essentially subserve the preservative integrity of the race.

But the mere preservation of what already exists; the preservation of the individual and of the race as

at present constituted is very obviously not the principal work of vital activity. The progress in vital achievement from mere animal life to the life of cultured man, this progressive development is too conspicuous and momentous a fact not to be recognized as that which is the most significant factor in vital organization and function. The entodermic organs and their functions in higher animals and in man are much the same. Viewed from the purely entodermic standpoint man is, indeed, a mere animal. The vast distance that separates him in a socially and culturally developed state from mere animals is embodied in the organs of the ectoderm. It is brain and brawn: brain with its all-revealing, all-realizing consciousness; brawn with its execution of volitional behests and all-fashioning manual skill; it is these ectodermic organs and faculties that represent the paramount result of creative elaboration. It is not stomach, liver, and spleen howsoever marvelously organized; not the breath emanating from the lungs once believed to be the very soul of life; not the blood and the heart propelling it, often looked upon as the essential structures in which life and its emotions are embodied. All these indispensable constituents of the vital organization of animals are but exquisitely wrought apparatuses of the vitally operated chemical laboratory, whose organic office is to prepare and to supply on the spot what is needed to carry on in full efficiency the life of outside relations.

In vital interaction with the outside world we live and have our being. Nothing that constitutes our life and our being has any significance save in relation to our physical and social environment. There exists in reality no such unrelated monstrosity as a self-

rounded individual or all-sufficient entity of any sort; a living, thinking being imagined as persisting to exist when detached from its natural environment. The individual is nothing merely to himself, his nature is preëminently hyperindividual. He is through and through physically and psychically adapted to his actual environment, and has been out and out organically developed to his present state of efficiency through interaction with the same. The individual is a mere focus, in which is concentrated for the time being the vital achievement of numberless generations of ancestors. It is a fatal mistake, not only scientifically, but also ethically and religiously to imagine the organically elaborated individual to be something of self-importance, something self-consistent apart from his actual environment; a being detachable from it all, and yet retaining his essential faculties, and this even when his own embodying vital organization has ceased to exist. It is no mere illusion of sense, but truest reality, that it has taken eons of creative travail and vital toil to elaborate the wondrous sensori-motor organization of the living substance to its present state of physical and psychological perfection as manifest in man. This eminently laborious creative result has its existence in a ceaselessly maintained interaction with the cosmic environment; being, in fact, a vital vortex ever newly produced by a perpetual in and outflow of cosmic influences.

It is a positively ascertained fact that the underlying vital structure of faculties not actually exercised infallibly degenerates. The organic structures and their functions having been developed in interaction with the influences of the environment to which they have become specifically adapted, and through which they receive their significance; it is only through continued

interaction with the same that they are efficiently maintained. The life of a saintly hermit who has wholly renounced the world was once deemed the acme or meritorious religious life and the highest fulfillment of the demands of ethical conscience. In verity such saintly life has, on the contrary, to be deemed a noxious perversity of the humanizing social life toilsomely developed in us by whatever beyond our own human power has creatively produced it. The mental life of such a saint, after he has turned away from the world and from social intercourse, continues to consist altogether in the use of the socially developed faculties he has inherited, and in the rumination of what he has learned through social intercourse by means of socially acquired and memorized linguistic signs. He owes, in fact, all he takes with him into his retreat of mental faculties solely to his social nature. If such a traitor to his entrusted human and social benefactions persists long enough in shunning everything that refers to social life and his own social nature, he will of necessity gradually degenerate into a benumbed imbecile, as has been abundantly proved. How many prisoners, forcibly deprived of social intercourse, and the means of exercising their social faculties, lose their mind and end in a lunatic asylum? Surely this sufficiently indicates that the socially isolated individual removed from his natural medium suffers deterioration of his humanized, and with it of his "spiritual" faculties, which are his most precious possession. We receive as a gift of supreme value our creatively elaborated organization and its vital faculties, whose predetermined functions point the right way to pursue in order to fulfill their appointed mission, which through rational and ethical use of them leads to the human-

izing development of our being. Our humanized nature, containing the all-revealing consciousness and all inherited faculties of body and mind, this free gift of surpassing worth deteriorates into mere animality if not rationally and ethically sustained by our own vital exertions.

The individual exercise of organically inherited faculties or dispositions of whatever kind, physical or psychical, alone secures the continuance of their efficient functional activities, and alone conduces to their further development. Who, then, can foresee the eventual outcomes of such progressive development rationally assisted in the direction of what has already been achieved, and with the knowledge of the means that have hitherto brought it about? The creative stress that amid cataclysmal upheavals has laboriously fashioned stage by stage the progressive formation of this terrestrial globe, eventually rendering it fit to evolve and sustain living beings, and at last fit to afford a suitable home to man, and the means for his civilized existence; this creative stress that amid perilous surroundings has succeeded increment by increment to vitalize and organize the mobile stuff that composes the eminently sensitive and frail living substance, and has through ages upon ages of disintegrative and reintegrative interaction with its environment ultimately developed it into the marvelously structured organism, with its multifold responsive modes of consciousness found in cultured man; this same creative stress that has accomplished all these formative and sense-informed results, who can foretell what more it can achieve, what further heights of progressive development it may scale, assisted as it now is by man's intelligent insight and increasing scientific knowledge?

The world revealed in conscious awareness consisted in early stages of organic development only of what directly conduced to guide the animal in satisfying its appetitive needs and in avoiding threatening dangers. In man this conscious awareness has expanded and deepened into a vast cognitively enlightened microcosm, consisting of a world of harmonized, systematized, and emotionally transfused inner and outer modes of consciousness; consisting, in fact, of the whole world we sense and know. The inner modes of consciousness that took their rise from mere appetitive needs have in civilized man already become through social intercourse to a considerable extent rationalized and moralized into a just and sympathetic appreciation of the equal rights and concordant sentiments of human associates, and into far-sighted regard for the welfare of the social community. Moreover, the germ of altruistic feelings implanted in the sexual relation has developed into a sense or conscience of dutiful responsibility for all that its satisfaction entails and imports in a state of social and ethical culture; a conscience that finds its immediate expression in affectionate and faithful devotion to one's mated life-companion, and in the solicitous raising of one's children so that they may become upright and useful members of the social community; altruistic sentiments these which expand so as benevolently to include the entire human race and its dumb dependents.

The outer modes of awareness, on their side, that took their rise in mere primitive tactual feelings have developed in civilized man into a widely comprehensive and grandly magnificent perceptual world, sense-aroused by delicately attuned touches emanating from the infinite, extra-conscious, power-endowed

macrocosm, out of whose productive activities all things proceed, and of whose all-containing nature so much becomes symbolically revealed, as has been cognitively incorporated in man's organic being, he forming himself an integrant part of the universal macrocosm. The constitution and potencies of this macrocosm, seemingly capricious, dread-awakening, and bewildering to primitive man, are becoming more and more adequately revealed and understood by means of scientific investigation. And although we are powerless to creatively impart to what are consciously apprehended as the things and forces of nature any additional efficiencies not inherent in themselves, they become, nevertheless, plastic under our hands by force of our intelligently and inventively arranging for them new opportunities to display new modes of efficiency through new modes of interaction among one another, resulting in outcomes which we render subservient to promote further progress in humanizing culture. The medium in which cultured life is actually carried on consists principally of such outcomes of inventive contrivances. Imagine them all annihilated, and with it would be annihilated the rational and ethical nature of civilized man. For he has become civilized in measure as the memorized consequences of his interaction with the inventive contrivances have become ingrained in his organic constitution. Of these ingrained and organically memorized acquisitions human speech with its means of expression has proved by far the most important. It has become creatively ingrained and organically memorized in what is positively known as the organ of speech, occupying a definite position in the brain and being structurally connected with the organ of hearing, of sight, of touch, of articulation. All these structu-

rally organized linguistic dispositions have been gradually superadded to the animal brain, and have evidently developed through constant linguistic exercise in social intercourse, and by means of the invention of various ways of linguistic expression, such as writing and printing. The faculty that distinguishes man preëminently from mere animals is his power of volitionally wielding the linguistic signs, which summon forth from latent memorized experience into actual awareness what they are meant to signify. A child deprived by organic inheritance of the organ of speech could not possibly grow up into a rationally humanized being. How utterly fanciful, then, the notion that reason or intelligence as an entity existing prior to organic development is endowed with the power of linguistically expressing itself without the toilsomely elaborated organ of speech. This fanciful notion of an unembodied or disembodied intelligence or reason of the human kind linguistically expressing itself, or at all existing, is something unthinkable to a thoughtful anatomist and physiologist. Intelligence or reason as we know it is inseparably bound up with speech, and speech itself is a functional outcome of the organ of speech.

In civilized man as now developed the sense-awakened perceptual world intimately interblended within his conscious content with all the culturally elaborated sentiments and aspirations of social life, constitutes a sentient and cognizant microcosm of supreme wealth and worth, compared to which the infinite starry heavens, dotted with huge insentiently seething masses are but raw-material in a more or less advanced state of elaboration. So sentimentally exalted above insentient nature has human life come to be, for it potentially

harbors, and actually emits, the all-revealing, all-fashioning world of consciousness, and it finds itself entrusted with the mission to coöperate in attaining the results of creative development. A world unrealized in conscious awareness, unapprehended, unseen, unheard, unappreciated, what desolate turmoil would it represent as such? It attains rational and eventually ethical value only by becoming organically harmonized in the living substance and consciously revealed in human awareness. And social communion and culture to become truly conducive to human welfare and to further progressive development have to be rationalized and moralized. Irrational conduct, which means in essence conduct averse to the developmental course of nature, leads infallibly to deterioration of body and mind. For conduct becomes rational only in measure as it concurs with the formative and progressive trend of creative development. Health of body and mind rests on this foundation. And so it stands with immoral conduct, for it necessarily leads to the undoing of the achievements of social life as established in truly civilized communities, and as organically ingrained in its truly humanized members, inevitably drawing with it the relapse of social existence into barbarism and savagery. Although nature outside human consciousness cannot rightly be called rational and moral, no more than it can rightly be called alive and sentient, the living and sentient, rationally and morally conscious humanized being represents here on earth the ultimate triumphant achievement of nature's ceaseless organizing activity. And this final result of the inscrutable creative activity can be maintained at its present height of development, and led to further progress, only by us rationally ascertaining through scien-

tific means the genuine factors that enter into the work of progressive development, and thus informed to aid them with moral good will in their beneficent course.

Finally, let us venture to express in a few terse sentences the philosophically matured attitude that the humanized individual is destined to assume towards the profundities and immensities of the sense-revealed universe. With exalted joy he will walk the earth, conscious of irradiating from out his own minimal self into the illimitable stretches of the outer world's impenetrable gloom, and amid its blindly contending forces, to irradiate into it all the glorifying luster that transforms it into a becalmed realm of surpassing beauty and appraised worth; conscious of casting into the shapeless darkness of its abysmal profundities the all-illuminating splendor of multicolored vision; of filling the silence of the mutely toiling spheres with a reverberation of glad and sad strains of tuneful song; conscious of apprehending beyond the subtle, sense-awakening touches that reach him from the bleak desolation of the vasty deep, the life-warm near presence of kindred beings, sympathetically sharing with him the emotive stirrings of their unseen inner life; conscious of feeling empowered to alleviate their pains and troubles, and of so shaping the common social environment that justice be done to all; conscious of being, amid the perils and griefs that beset his individual self, the bearer and transmitter of all that has proved life-worthy and enduring in ages upon ages of victory over the devastations of death and decay; conscious of being capable watchfully to decipher with scientific zeal the true significance of the hieroglyphic signs that disclose the momentous secrets of nature's

doings, and of inventively directing their efficiencies so as to bend them to the furtherance of human well-being; conscious of being at times seized by the divine frenzy that pierces with prophetic insight into the brooding depths of his all-revealing self, fashioning forth from it into formful artistic expression the things that human aspirations are longing for; joyfully and reverentially conscious of feeling the sweep of the universal potencies coursing through his being, and revealing within the harmonizing repose of his conscious awareness the achieved wonders of their creative travail.

Thus tuned to the creative trend can there be a doubt that life in itself is worth living? ¹

¹ See "Fatalistic Science and Human Self-determination," Boston, "New Ideal Magazine," 1889-1890. "Ethics and Biology," "International Journal of Ethics," 1894. "Our Social and Ethical Solidarity," "International Journal of Ethics," 1897.

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