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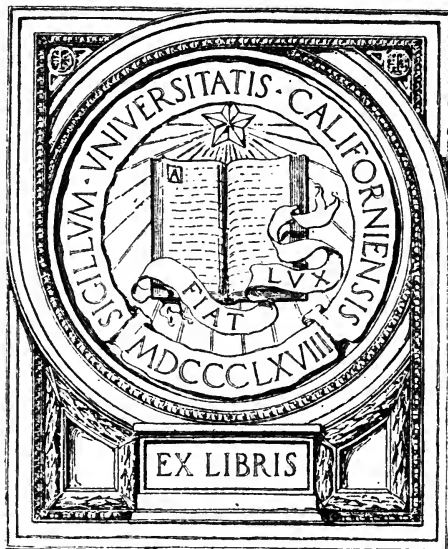


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A STUDY

OF

Consciousness, Intelligence and Matter

BY

DR. GEO. PYBURN

SACRAMENTO:
PRINTED FOR GEO. PYBURN BY
J. N. LARKIN & SON
1901

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PROLOG

The original of this paper was written in 1881, for publication in one of the scientific magazines. By reason of a change of policy about this time in the conduct of the magazine in question, the paper was laid aside and partly forgotten. On February 13, 1887, it was read in its present form before the CRITIC CLUB of Sacramento—the first essay.

Quite recently, in reading a critical notice of Prof. Ernst Haeckel's latest work, "THE RIDDLE OF THE UNIVERSE," I was pleased to note the general accordance of the ideas herein set forth concerning the (so to speak) intelligence of matter with the Jena Professor's idea of a "sole substance;" although it had not occurred to me to label them MONISM. I concluded, however, to publish the essay for the benefit of my philosophic friends, as a fairly comprehensible introduction to one portion of the Monistic philosophy.

To the members—past and present—of the CRITIC CLUB, I present this essay, asking them to accept it as a SOUVENIR of the many "feasts of reason" of which we have partaken at our meetings during the past fourteen years.

G. P.

Sacramento, February 13, 1901.

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A STUDY

—OF—

CONSCIOUSNESS AND INTELLIGENCE

HYLAS. * * I see you turn when spoken to, and shrink when burned. From such facts, joined with my personal experiences, I infer that you are sensitive (conscious) as I am; and * * I infer that matter is not sensitive (conscious) because it shows no such sign.—HERBERT SPENCER.

It is somewhat difficult to express, in the few words of a title, the scope of an essay of the nature of this, which I have the honor to submit to your consideration and criticism this evening. My object herein is to analyze consciousness and intelligence, with a view of discovering their elements, and the extent of their distribution in the universe. Even the word distribution, which is here perforce used, is somewhat apt to mislead; for, whereas it seems to convey an idea of diffusion from a center or point of accumulation, the intent of the word in its present connection is nearly the contrary, namely: existence outside of or beyond those concentrated and organized beings whose intelligence is evident and acknowledged by all.

And while I am aware that the conclusions delivered herein are opposed to the commonly accepted teachings, and may possibly, on further consideration, be found fallacious and untenable, I am not thereby deterred from presenting them in their present form; nor do I deem an apology to the philosophic hearer necessary, because I conceive that the consideration and orderly statement of the several facts and inferences involved in the discussion of any subject—especially if new—including as it does the examination in detail of the related ideas going to make up the several propositions,

and a testing of their congruity or cohesive power, has a value independent of the truth or precision of the conclusions reached meanwhile. For besides the mental discipline secured by the discussion, the conclusions reached—even though false or inexact—furnish new points of departure, or data, on which by comparison with accepted truths to found dissent and corrections.

Premising that by “consciousness” is meant the subjective side of existence, the passive cognition of the objective *non-ego*, together with the cognition of the reaction thereby excited, our inquiry will be directed mainly to the discovery of the ultimate factor in consciousness and its relation to matter. This inquiry will involve an incidental examination of the position assumed by Hylas, viz.: that matter shows no signs of sensitiveness (consciousness).

Consciousness, evidently, is to the individual the central fact, or more precisely, the sum-total of existence. There can only be present-consciousness; and this consists of the impressions made by outside things at the moment, together with the memories or continuance of impressions made heretofore. It is the sum or resultant of all the impressions experienced by its subject up to the present moment. But the question at once suggested is this: Since when? From what epoch are these impressions or experiences to be reckoned? From birth; from conception; from the infancy of the race; from the beginning of organic life on the globe; or from the dim past in the ages behind? And precisely here is the germ of the argument, the inferential statement of the problem.

Let us leave for a while the subjective side of existence and turn to its objective side. If we examine and analyze any organized being, *e. g.*, a man or plant, we find that the various tissues or organs are composed of the common material of the planet, arranged in such

and such modes, so that the difference between this and that organ, or between this and that body, consists solely in the ratio and mode of arrangement of the various constituent elements. The bulk of the whole is but the sum of the bulk of the atoms and molecules which make up its structure; and the weight of the whole is no more than the sum of the attractions of its constituent atoms for those of the earth. Without the original matter of which they are severally composed, no organized bodies would exist; unless the matter were possessed of extension, resistance, weight, etc., the body which it composes would not have these properties, for the whole is but the sum of all its parts, and *anything not found in the parts can never appear in the whole.*

If, further, we examine by the light of scientific conclusions a living organized being, we shall find that its life—objectively considered—consists of a more or less coherent and co-ordinated series of movements; and this, whether we consider especially the so-called organic life in animal or plant, or the life of relation in animals, the voluntary life—from the pursuit of prey by a hungry carnivore to the singing of an aria or the painting of a picture by cultivated human beings. Moreover, we are driven to the conclusion that these highly complex movements of the whole body are but the resultants of the movements of the various parts, organs, molecules and atoms of which it is made up. Indeed, the physical fact is, to a limited extent, demonstrable: we can see the cyclical movement of the blood, and the motions of the muscular and osseous apparatus, and feel the motion of the air in the larynx, observe by suitable reflectors the vibrations of the vocal chords, and with the unaided eye, the motions of the tongue and the changing shape of the buccal cavity, which together make up the complex motions performed in singing the Marsellaise, or an Ave Maria. Shall we then stop

abruptly where our eyes cease to be of use? or, in the language of an eminent physicist and philosopher, permit "the vision of the mind to supplement the vision of the eye, and impelled by an intellectual necessity, cross the boundaries of the experimental evidence," and discover in the motion of these parts and organs, which demonstrably go to make up the motion of the whole, the resultant, and only the resultant of the movements of *their* constituent parts, down even to the ultimate atom? Of a surety, if there were no motion of parts, there could be none of the whole; and the motion of the latter is precisely the sum and resultant of the motion of the former.

Returning now to the subjective side of existence: if we assert that the same principle which holds good when applied to matter and motion, namely: that the whole of either or both is but the sum of their several parts, and that nothing can exist in the whole which does not exist in the parts, is equally applicable to consciousness, shall we strain the analogy? I think not.

A certain difficulty presents itself in discussing this subject, consequent on the necessity of using words having specific or relatively specific meanings, to indicate general or less specific ideas. We find the same difficulty, however, in speaking of vision, audition, intelligence, æsthetics, etc., in the lower orders of animals. To express even approximately correct ideas in reference to the latter, we are compelled to deanthropize words so as to bring them into correspondence with non-anthropoid existences.

Bearing in mind, then, these considerations, shall we find any good grounds for disputing, that *without consciousness in the atom, there can be none in the mass*; or conversely, that since consciousness—organized consciousness, if the phrase be permitted—is a (subjective) whole, corresponding and belonging to an organized

body, therefore it (the consciousness of a man *e. g.*) is made up of, and is but, the sum and resultant of the consciousness corresponding and belonging to the constituent atoms and molecules of its proper body? If the parts be not conscious, while the whole is, then a new element has been added to, or created by, the combination, and the whole is found to be greater than the sum of all its parts.

If we arrive at the same result by different processes of thought, we feel so much the more convinced of the correctness of our conclusions; let us proceed, therefore, to inquire into the reasons which lead us to infer the existence of consciousness in our fellows. How do we become convinced of the experience or possession of consciousness by others? It needs no argument to show that the only thing *known* to any of us is his own consciousness; and yet all of us are fully convinced of the existence of consciousness in others, and of a kind, we conclude, more or less like to our own. Indeed, we govern our intercourse with our fellows on just this presumption. By what process of reasoning do we arrive at this conclusion?

In general terms, we predicate consciousness in man and animals when we see them manifest change of state—form, motion, etc.—following and presumably consequent on changes in their environment, or on changes in their relations to environment. We tickle them and they laugh, poke them with a stick and they move, threaten them and they flee or fight. In man, possessed as he is with the faculty of speech, moreover, we hear and see him describe his conscious states by symbols such as we have learned to use in describing our own. We see in him, moreover, movements indicative of this or that emotion, which being experienced by ourselves would prompt the same or similar movements. Thus, by inference, from observing purely ob-

jective phenomena, various in detail but similar in essence, we become satisfied that others, like ourselves, are sentient and conscious.

In accepting this statement, however, we are compelled to admit that consciousness is not the exclusive property of any sharply-defined group of existences; but, on the contrary, is as widely diffused as the extent of our observations enables us to judge. Suppose we examine the matter in detail:

Taking for granted the consciousness of the higher order of animals, let us descend the scale. An earth-worm, if we shake the ground in which it lies, comes out to the light of day; we touch it with a stick, or push it aside with our foot, and it wriggles and attempts to escape. We find no difficulty in conceding to it a certain low kind of consciousness. But if we touch the leaves of a sensitive plant (*Mimosa pudica*) it folds its pinnæ and its branching leaf-stalks and bends down its petiole. If an insect alight on the orbicular leaves of the sundew (*Drosera rotundifolia*), or a small fragment of flesh be laid thereon, the leaves close around the intruder, more slowly, it is true, but just as surely as a lurking spider closes on an unlucky fly entangled in his web. The terminal pinnæ of the leaf of Venus' fly trap (*Dionæa muscipula*) respond to the touch of the fly, just as surely as the maxillipede of a crab or lobster responds to the touch of a stick, or of some more juicy morsel on its serrated edges.

Are these plants, then, conscious? No? Then our method of inferring consciousness, as above set forth, is inaccurate and needs revision. Yes? Then we cannot stop here! All plants turn to the light; in general terms they change their state (position) in response to change in their environments. Climbing plants revolve their apices in search of support, or bend their leaf-stalks and tendrils around it when found. The *Des-*



modium gyrans unceasingly fans the air in the sultry heat of an Indian day; the *Mimosæ* (*acacias*), *Clovers*, *Oxalises*, and many other plants, spread out their leaves to the sunshine, and fold them up as darkness supervenes. *Calendula*, *Oxalis*, *Mesembryanthemum*, and a host of well-known flowering plants open their flowers in the light and warmth of the orb of day, and close them up at night or in gloomy weather; and this they do day after day, and night after night, in frequent alternation. The so-called infusoria move through the surrounding waters in pursuit of food, avoiding collision with each other, but at the proper time finding their respective foods and sexual mates. Are these various organisms, too, to be considered void of consciousness, or the contrary?

And when, still descending, we come to the inorganic world, and observe the behavior—mark the word—of mineral and elementary substances, we shall find no break in the chain of evidence by which alone we have hitherto recognized, or from which alone we have hitherto inferred consciousness.

If we take a piece of the metal potassium, and plunge it into a vessel filled with benzine, gasoline, or other like fluid, it will remain quiescent for an indefinite period of time; but change its environment—plunge it into a vessel filled with water—and its behavior changes instantly. At once the hitherto passive potassium attacks the water, appropriates its oxygen and part of its hydrogen, and this with such vehemence of motion as to ignite the escaping portion of hydrogen. Poke potassium with a stick of one kind (benzine), and it stirs not; tickle it with a straw (of water), and lo! it turns and laughs.

A piece of silver, however, may be plunged into water, and it will remain passive, quiet; it will give no sign of consciousness of its surroundings. But plunge it

into nitric acid and see how it responds to the changed environment. Bubbles of nitrogen-oxide gathering at the surface of the liquid and forming an orange-colored atmosphere above it, soon show that it is actively engaged in pulling to pieces the nitric acid in order to satisfy its affinity (liking) for oxygen.

Shall I strain your logic if I ask you to admit that these two examples—which might be added to indefinitely—show a power in the metals named to distinguish between benzine and water, and between water and nitric acid, respectively? Is it needful to insist that a necessary correlative to the power of distinguishing is consciousness? There must surely be *cognition* of at least one of the things distinguished.

It may be well here to point out the manifest differences in kind and degree of sensitiveness shown by different things and beings, as going to explain why the same impinging object—stimulus—does not evoke consciousness and responsive motions in all alike. These differences depend, doubtless, on complexity of aggregation, combination, or organization in the subject considered. Plants and animals take cognizance of light, warmth, food; the savage, in common with animals, includes in his cognitions relations of sex and paternity, friends and enemies, sounds, the fitness of weapons, etc. The more cultivated groups of men, in addition to these, are sensitive to harmonies of sound and color, beauty of form and motion, the involved relations of numbers, magnitudes, sentiments and laws, the reactions of the various parts of the cosmos on each other, and the like. Minerals take cognizance only of things closely related to them by affinity (whatever that may be) and close proximity. Even among men of the same race, and living in society together, we see individuals who are utterly unconscious of qualities and entities which are vividly perceived by others; and

this state of affairs, in the light of the considerations just set forth, is easily explicable; but on any other theory its explanation is beset with insuperable difficulties.

If we pause here to inquire how intelligence is related to simple consciousness, we shall find that the former is founded on the latter. Those who are born blind, or deaf, can never—other things being equal—be as intelligent as those who are furnished with their full complement of sense-organs. They have fewer points of contact with their environments, and are less sensitive to certain impacts and certain qualities or motions of the *non-ego*. This proposition is by implication admitted when we express surprise at even the mediocre attainments in the arts, or in the acquisition of knowledge under systematic instruction by those born blind or deaf. When we speak of an intelligent man or woman, we mean one who has knowledge of things; that is, one who has cognized and is conscious of their qualities and relations among themselves and to himself; and who, in addition, has the power of so modifying his own movements under changing circumstances and relations as to enjoy a continuance of pleasurable consciousness therefrom; one who is able to adapt himself to the requirements of the moment, and to do what is fit under changing and enlarged conditions. But this—reduced to the lowest terms—is cognition of the diverse and complicated motions outside, and ability to find the resultant of these and his own proper motion. And the greater the knowledge—that is, the broader the area, and the deeper the stream of consciousness, and the greater the power of adaptation—the greater the intelligence.

Now if we attempt to account for the existence of intelligence in the higher order of beings and man, we can not do so, satisfactorily, on any other theory than this,

namely: that matter throughout the cosmos possesses, even in its ultimate atoms, the essential element of consciousness and intelligence, which is this: *cognition of impact of the non-ego, and the tendency on impact to change of motion in the path or line of least resistance*; in other words: *cognition of impact of the non-ego, and the tendency to adopt the motion of the impinging body (atom, molecule, etc.) to the extent of its relative quantity and quality*. And the more carefully we consider this proposition, the more clearly shall we find it to formulate a definition of intelligence; knowledge of the environment and conscious ordering of the life—motions—to fit; inherent power of adaptation.

That such a universality of this sensitiveness to change of environment is found in nature, we have learned in our previous studies herein; and although the differences in degree are great in the various orders of things, *e. g.*, in minerals to chemical qualities, in plants to sunshine, the touch of insects, supporting bodies and the like, in man, extending to those relations we call intellectual, emotional, social and ethical; nevertheless, the difference between the range of the savage and that of highly cultivated man is scarcely greater than that between the savage and some of the lower animals, or than that between these latter and the conspicuously sensitive plants. Indeed, this power of adaptive modification throughout organic nature, having for its basis consciousness of impact of surrounding existences, appears to be the fundamental source of EVOLUTION; and here we perceive no breach of continuity, no beginning, no end.

There are but two theories by which to explain the existence and manifestation of intelligence seen throughout nature: either the intelligence is *outside* of a purely passive and plastic material, which receives the impress and motions of the external force; or, in the classic words of Tyndal, "*in matter * * (is) the promise and potency*

of all terrestrial life," including, of course, its intelligence.

Shall we, then, say that matter is intelligent? I see no way of escape from this conclusion, startling as the assertion may appear. If we duly estimate the value of the facts here passed in review, and bear in mind the considerations previously set forth, relative to the difficulties encountered in the use of words in new connections, we must at least find the *raw material* of intelligence in the *raw material* of living beings—matter.

With this view of things, we need not trouble ourselves to search for the "beginnings of life"—the time and place when and where "dead matter" became organic and "living." The beginnings of life are in the "stuff" of which things consist.

However, not to leave the question without considering possible objections, let us proceed to review some of these. During sleep, consciousness is said to be abolished; our first impressions on awaking connect themselves with those last experienced before falling asleep; and were it not for the different condition of surrounding things, *e.g.* the clock-hands, the sun's altitude, the activity of our fellows, joined to certain internal feelings of rest, hunger, etc., which have supervened, we should not know that any interval had elapsed. The same condition, in a greater or less degree, obtains in the unconsciousness and delirium of coma and fever, of alcoholic and other intoxications, of syncope and epileptic paroxysms, somnambulistie and cataleptic states, and as caused by blows and other injuries to the encephalon. At first blush it would appear that the proper inference to be drawn from these facts is this, namely: that consciousness is an accompaniment *only* of cerebral activity, and that, therefore, it must be denied of those organisms which are not provided with cephalic ganglia, and *a fortiori* of those

which are entirely devoid of a nervous apparatus, and of plants and minerals.

But a critical examination of the case in the light of the philosophy of consciousness will, I think, show that this inference is false, and that, so far from consciousness *per se* being absent in any of the cases adduced, it is only the co-ordinated consciousness of the complete organism which is thus temporarily abolished.

Examine first the case of sleep: This we know is frequently accompanied by dreaming—which may be seen by observing the subject during its continuance—and yet the dreams may not be remembered on awaking, and the answer to an inquiry, “Did you dream?” will be “No, I remember nothing since falling asleep.” Conversation may, in many instances, be carried on with sleepers, who, on awaking, will tell you that they have not dreamed, and they retain no memory of anything done or said. In addition to this, we have evidence that during sleep the subject is conscious of pressure, change of temperature, etc., for he will turn for change of position and cover up with the bed-clothes. Similarly, in the other—abnormal—conditions mentioned, as sleep-walking, catalepsy, etc., evidences are not wanting of sensitiveness to external influences and objects, and of quasi-intelligent conduct in relation thereto.

In like manner, during the delirium of coma and fever, while the patient on recovery will tell you that the last thing remembered is this or that occurrence previous to the delirium, and that he is ignorant of the length of time which has passed since, the attendants know that meanwhile he has given evidences of consciousness (and intelligence) in numerous instances, replied to questions, obeyed orders, eaten food and swallowed drink. For reasons, however, to be afterward discussed, the two sets of experience, namely: that during the normal state, and this during the delirium, etc., are in no way connected,

and hence are not recalled by association; they are not related nor continuous, and hence do not suggest each other.

On this subject, the remarks of Herbert Spencer, in his chapter on *Æstho-physiology* (Prin. of Psych., Vol. I, p. 105, Am. Ed.), are to the point: "For the recognition of a sensation as such, or such, necessitates the bringing of it into relation with the continuous series of sentient states, from some of which, simultaneously experienced, it is dissociated by perceived *unlikeness*, and with others of which, previously experienced, it is associated by perceived *likeness*; and the implied comparisons of sentient states are impossible unless the correlative nervous changes are put in connection at one place. It does not follow, as at first seems, that feelings are never located in the inferior nerve-centers. On the contrary, it may well be that in lower types the homologues of these inferior centers are the seats of consciousness." Thus far Spencer.

It may be, and I think it likely, that in the same manner as we of the present day, with our extensive and relatively complex knowledge, are quite unable to realize the thoughts and feelings of savages or children in view of this or that phenomenon—to us easily explicable because already classified and correlated—so the extensive, heterogeneous and complete consciousness of the encephalon is unable to realize the less complete and fragmentary consciousness experienced by the lower nerve-centers and is unable to unify them with the series with which memory backs up those of the present moment.

In this manner only can be explained the fact of the oblivion in which the feelings and experiences of very early childhood are buried; they are so utterly incongruous with those of the present time as to be—so to speak—incommensurable.

This subject is so replete with interest, and so many instances might be cited from the annals of mental path-

ology and psychology corroborative of the views here set forth, that one is loth to close its presentation in such short order, but the limits of time prescribed by the occasion have already been overpassed; I shall, therefore, close here, and submit the question to your consideration and discussion.

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