D. Thesis

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Physiology considered in relation to human knowledge and responsibility.

The discussion of the nature and limits of human knowledge has been eagerly conducted in every civilized age, and among all classes of men whose reflective powers have attained maturity.

In ancient Greece, the extremities of philosophical discussion were found in the Eleatic and Heraclitean philosophies. The Eleatic maintained that permanent being was the principle of all that exists, and denied all becoming as illusion. Heraclitus held that all things were in continual flux, his principle was one of becoming. Other systems of philosophy took a place between these extremes. Plato with great constructive skill combined what was valuable in these philosophies into his celebrated ideal system. The permanent element was represented in the idea, the becoming in the phenomenal. Both the permanent and the phenomenal were found in all space and time with no dividing line between. In man they also were found, the ideal element cropping up as self-conscious thought, the phenomenal as sense.
A quadruped, time the subject in the subject, and the quadruped is. 

The quadruped, time the subject in the subject. And the quadruped. 

A quadruped, time the subject in the subject. And the quadruped.

The quadruped, time the subject in the subject. And the quadruped.

A quadruped, time the subject in the subject. And the quadruped.
Sometimes hear it enunciated by weighty authorities, as if it is natural consequence, the suppression of such studies, had the force of a moral obligation. 

"In this case, however, as in some others, those who lay down the law seem to forget that a wise legislator will consider, not merely whether his proposed enactment is desirable, but whether obedience to it is possible. For, if the latter question is answered negatively, the former is surely hardly worth debate.

"Here in fact lies the path of the reply to those who would make metaphysics contraband of intellect. Whether it is desirable to place a prohibitory duty upon philosophical speculations or not, it is utterly impossible to prevent the importation of them into the mind. And it is not a little curious to observe that those who most loudly protest to abstain from such commodities are all the while unconscious consumers of one or other of their subtle adulterations or adulations. With mouths full of the particular kind of heavily buttered toast which they affect they inveigh against the eating of plain bread. In truth, the attempt to nourish the human intellect upon a diet which contains no metaphysics..."
is about as hopeful as that of certain Eastern bays to nourish their bodies without
destroying life. Every body has heard the story
of the pitiless micro-cockpit, who ruined the
peace of mind of one of these mild enthusiasts
by showing him the animals moving in a
drop of water with which, in the
innocency of his heart, he slaked his thirst;
and the unsuspecting devotee of plain
common sense only look for an unsuspected
a shock when the magnifier of seven
lenses reveals the forms, if not the full-size
shapes, of lively metaphysical postulates
rampant amidst his most positive and
matter-of-fact motions.

"By way of escape from the metaphysical
Will-o'-the-Wisp generated in the chambers
of literature and theology, the serious student
is sometimes hidden to betake himself to
the solid ground of physical science.
But the池 of immortal memory, who
threw himself out of the preying fen into
the fire, was not more ill-advised than
the man who seeks sanctuary from
philosophical persecution within the walls
of the observatory or of the laboratory. It is
said that metaphysics owe their name to
the fact that in Aristotle's works
questions of pure philosophy are dealt
with immediately after those of physics. If so, the accident is happily symbolical of the essential relation of things; for metaphysical speculations follow so closely upon physical theory as black cane upon the horse. man.

One need not mention such fundamental and indeed indispensable conceptions of the natural philosophers as those of atoms and forces; or that of attraction considered as action at a distance; or that of potential energy, or the antinomies of a vacuum and polonium; to call to mind the metaphysical background of physics and chemistry, while in the biological sciences, the case is still worse. What is an individual among the lower plants and animals? Are genera and species realities or abstractions? Is there such a thing as vital force? or does the term denote a mere relic of metaphysical petichism? Is the doctrine of final Causes legitimate or illegitimately? These are a few of the metaphysical topics which are suggested by the most elementary study of biological facts.

"But more than this, it may be truly said that the roots of every system of philosophy lie deep among the facts of physiology. No one can doubt that the organs and functions of sensation
are as much a part of the province of the
physiologist as are the organs and function
of motion, or those of digestion; and yet it
is impossible to gain an acquaintance
with even the rudiments of the physiology
of sensation without being led straight to
one of the most fundamental of all
metaphysical problems, in fact the sensory
operations have been from time immemorial
the battle-ground of philosophers."

In corroboration of the fact that the roots
of every system of philosophy lie deep among
the facts of physiology, Professor Huxley
makes the following clear and incisive
statement regarding Sir W. Hamilton.

"Even Sir William Hamilton learned
and historian and acute critic as he was,
not only failed to apprehend the
philosophical bearing of long-established
physiological truths; but, when he
affirmed that there is no reason to deny
that the mind feels at the finger points
and none to assert that the brain is
the sole organ of thought, he showed
that he had not apprehended the
significance of the revolution commenced
five hundred years before his time, by
Descartes and effectively followed up
by Haller, Hartley, and KEMP, in the middle last century.

Another instance exhibiting the impossibility of separating science from metaphysics is seen in the case of Professor Tate, who, unwittingly to himself, stumbles into the metaphysical cloud which he wishes to avoid. Several times throughout his writings he speaks scornfully and disdainfully of metaphysics. Before stating the grounds upon which he says, "There is a strong temptation to some metaphysical here, but we will endeavor to resist it.

Again in critiquing the old dogma Causa Dei aequat effectum, he thus expresses himself: "The fact is, that we have not yet cast off that tendency to so-called metaphysics which has already completely blasted the already promising career of a physical inquirer. I say, 'so-called' metaphysics, because this is a science of metaphysics; but from the very nature of the case, the professed metaphysician will never attain to it."

Again, "There is nothing to be learned a priori. We have no right whatever to ascertain a single physical truth without..."
seeking for it physically unless it be a necessary consequence of other truths already acquired by experiment, in which case mathematical reasoning is alone requisite.

This is strong language, and no doubt intended as a hard blow for the metaphysician. Unfortunately, however, for Professor Tait, they recoil on his own head. In his work, The Unseen Universe (by Mr. Stewart and P. T. Tait) he objects to the theory of Rosconich which regards the atom as a 'centre of force' on the ground that it requires away altogether the idea of stuff or substance, which the mind seems to require as something underlying the notion of anything which is found to be directly capable of affecting our senses.

To prove the existence of a material atom on the ground of an intellectual necessity, which the mind requires as something underlying the notion of anything which is found to be capable of affecting our sense, is metaphysics pure and simple, without the slightest trace of adulteration. Accordingly, Professor Tait has not yet cast off that tendency to be called metaphysics which, in his case, has certainly not "blasted the already promising Career"
of a physical inquirer. Instead of proving his ethical conclusions, as he maintains, "from a purely physical point of view," he falls back upon metaphysics as completely as the professed metaphysician.

Another reason why science cannot be separated from metaphysics arises from the fact that many speculators approve of the theory of Roscovich, which regards the atom as a centre of force. This theory proves very attractive to Professor T. H. Huxley, who repeatedly approves of it in his writings. Now Hume has irrepressibly proved that force is not an object of the senses, and therefore out of science. This notion is derived from mere exercise of power. "I am" is inseparably associated with "I am." Consciousness of power is inseparably associated with consciousness of existence. To define the nature of force one has to fall back upon metaphysics.

Again, the intimate relation that exists between Physiology and Psychology is proved from the fact that between the external world and Consciousness there exists the nervous system. Consciousness it is admitted exists in the grey matter.
on the surface of the brain. The nerves are the instruments by means of which nerve motion is conducted to the brain, where it is interpreted into its mental equivalents. Accordingly, that between the external cause of a sensation and the sensation, there is interposed a mode of motion of nervous matter by which the state of consciousness is no likeness, but a mere symbol, is of the profoundest importance. It is, as Huxley says, "the physiological foundation of the relativity of knowledge, and a more or less complete idealism is a necessary consequence of it."

According to Waller, Physiology deals with the chemical and vital changes that occur in and by living matter. The discovery of these changes has been a slow process. In earliest times, men had no notion whatever of the mechanism by means of which the body was moved, head and hands and feet were endowed with life, and the life seemed to them capable of explaining the motions of the bodily mechanisms. Homer and Hippocrates, Plato are said to have had no idea of the muscles. Aristotle deemed
the nerves of sensation which he called the "canals of the brain," but he says nothing of the mechanism of motion. Galen (A.D. 120) carried on his anatomical studies by means of barbarous experiments on animals. In his time the function of the muscular system were pretty well known. In his great work, on the anatomy of the nerves, he says: "That none of the muscles of the animal either exercises voluntary motion or receives sensation, and that, if it were all cut, the part becomes inert and insensitive in a knowledge of all physicians. But that the origin is partly from the brain and partly from the marrow. I proceed to explain." Evidently he proves that sensation and motion originate in the brain, and repletes those who placed the hypnemonic or instinct principle of the soul in the heart. Still, Galen refused the heart as the seat of courage and anger, and the brain the seat of the soul.

After the time of Galen there settled over Christendom the darkness of the Middle Ages, during which, for centuries, the works of Aristotle reigned supreme. But the advent of Copernicus, of Galileo Galilei, and others like mind awoke the European intelligence of Europe.

In 1578 was born at Folkestone the immortal Harvey. He first studied at
Cambridge. Afterward he studied at Padua under the celebrated fabricius of agernpont. Fabricius discovered the valves of the veins. Fabricius discovered that they all turned toward the heart. Harvey carried on the discovery still further. He observed that the arteries had no valves. He still further observed that on tying the veins, the blood accumulated on the distal side of the ligation, that on tying the arteries, the blood accumulated on the proximal side of the ligation. Reflecting over these facts, he came to the conclusion that the blood was impelled by the heart through the arteries, and that the blood returned by the veins to the right side of the heart, and thus established the double circulation of the heart.

The discovery of the circulation of the blood imparted an extraordinary impulse to anatomical and physiological studies, and important discoveries were rapidly made. One of the most important was that of the circulation of the blood that of Sir Charles Bell: discovery of the motor and sensory nerves.

Professor was led attache send importance to the writings of Descartes, although in doing so he anticipated "a smile of incredulity." He ranks
Descartes was a great and original physiologist. It is a matter of fact, he says in his work on the greatest physiologist of his day, eighteenth century, Galles, in treating of the functions of nerve does little more than reproduce and enlarge upon the ideas of Descartes. It is a matter of fact that Daniel Hartley in his remarkable work the 'Essay on man' expressed, though still insufficiently, the resemblance of his fundamental conceptions to those of Descartes, and I shall now endeavour to show that a series of propositions which constitute the foundation and essence of the modern physiologies of the nervous system are fully expressed and illustrated in the works of Descartes.

The brain is the organ of sensation, thought, and emotion, that is to say, some change in the condition of the matter of this organ is the invariable antecedent, of the state of consciousness to which these terms are applied.

The movements of animals are due to the change of form of muscles, which shorten and become thicker, and the change of form in a muscle arises from a motion of the substance contained within the nerves which is to the muscle.
"The sensations of animals are due to a motion of the substance of the nerves which connect the sensory organs with the brain. The motion of the matter of a sensory nerve may be transmitted through the brain to motor nerves, and thereby give rise to contraction of the muscles to which these motor nerves are distributed; and this reflection of motion from a sensory into a motor nerve may take place without volition, or even contrary to it.

The motion of any given portion of the matter of the brain excited by the motion of a sensory nerve, remains behind or continues the moved in the same way in that part. Anything which pungulates the animal gives rise to the appropriate feeling. This is the physical mechanism of memory."

Interesting as it would be to trace the discoveries of anatomy and physiology down to the present day, such a course is hardly necessary, the main object of this lecture being to determine the bearing of physiology upon the nature and kinds of knowledge. In his lecture on "Sensation and the Accidens Organ," professor Barlow sums up the result of modern
Physiology with its usual clearness and lucidity. After describing the anatomical
structure regarding the olfactory sense, p. 207, he turned up thus regarding it: "The
inner ends of the olfactory cells are connected with nerve fibres, passing into the cavity
of the skull at length and in a part of the brain, the olfactory recess or
sinusium. It is certain that the integument, or skin, and
the physical viti. Connection of all these three structures – the epithelium of the
sensory organ, the nerve fibres, and the
sinusium, are essential conditions of
ordinary sensation. Moreover, the
epithelium may be said to be the recepta,
the nerve fibres, transmission, and the
sinusium, essential. For in the act
of smelling, the particles of the odorous
substance produce a molecular change
(which barthley was in all probability
right in terming a vibration) in the
epithelium, and this change being
transmitted to the nerve fibres passing
down them with a measurable velocity,
and finally reaching the sensuim
immediately, followed by the sensation."

After describing the scieniferous organs
Connected with the sensations of Taste, Heat and
Cold, Vision and Hearing he summed
regarding them: "Whatever be the apparent diversities among the sensorsiferous apparatus, they share certain common characters. Each consists of a receptive, a transmissive and a sensificating part. The essential part of the first is an epithelium. Of the second nerve fibres. Of the third aspect of the brain; the sensation is always, the consequence of the mode of motion excited in the receptive, and conducted along the transmissive, to the sensificating part of the sensorsiferous apparatus. And in all the senses there is no likeness whatever between the object of sense which is matter in motion and the sensation which is an immaterial phenomenon." Thus all the higher organs start from one foundation, and the receptive epithelium of the eye or of the ear, is a much modified epidermis as is that of the nose. The structural unity of the diverse organs is the morphological parallel to their identity of physiological function which, as we have seen, is to be impressed by certain modes of motion, and they are fund or caused in proportion to the delicacy or the strength of the impulse by which they are to be affected. Reserving Criticism at Present I now
turn to the all. important question

What is knowledge?

All knowledge comprises a relation between subject and object. There must be a subject to which the act of knowledge is directed, and an object upon which the act of knowledge is directed. Such an act arises not from a mental passivity, but from a mental activity. Accordingly, the mental subject possesses a distinct constitution, and exercises itself as a distinct factor in existence. This demand is no more unreasonable than what is asked for by the Chemist when he maintains that his atoms possess a distinct constitution and remain the same throughout all their combinations.

The mental subject becomes aware of this activity in the act of perception. In this act he becomes aware of himself as active in antithesis to an activity, which is other than his own i.e. the activity of an object. This constitutes a dynamical antithesis between self and other than self, and from which is derived the idea of cause. It also comprises a geometrical antithesis between myself...
as here and the object as there, and thus originates the idea of space, from the continuous flow of sensations which alternately displace one another, and which belong to the same sentient subject, there arises the idea of time. These ideas - personality, causation, space, time - are the data of intellect, arising from an a priori facilitative activity, which rationalizes the raw materials of knowledge.

As these ideas constitute the very cardinal points of philosophy, it is necessary to consider more fully their nature and kind.

Philosophy, according to the sensations hypothesis, the mind is constituted of the sum of sensations; there is no distinct personal agent. Sensations come and go either in clusters or in file. Similar sensations, or those which have been experienced in contiguity, tend to stick together. Now the difficulty which this hypothesis encounters is, how is it possible out of these primitive passivity to extract an activity. In dreams and hallucinations the mind is subjected to the same passivity, but to separate the true from the false
the mind exercises a rational activity, and subjects these sensations to scrutiny and to criticism in order to separate the true from the false.

On the materialistic hypothesis, the same difficulty is encountered. Here sensations are the products of molecular changes in the brain, as such they are effects, and according to the theory of the Conservation of Energy, they must play a part in the transformation of energy. In such a theory it is utterly impossible to separate the true from the false. In such a theory there is no reason why the material forces should not disappear into the mental world, or on the other hand, the mental energies might disappear into the material.

The mind, however, exercises an activity of its own, and as such stands for itself as a distinct factor in being. Such an activity is required to account for some of the most patent facts regarding mind. It constitutes the mind a cause, that is, an agent capable of determining an act of choice or of rational determination.

The denial of this truth reduced a personal agent to a merely natural object in nature. Man is as much the outcome
or product. All laws in the plant and
breezes that flourish in his garden or his field.
Truth and falsehood, right and wrong,
are more like as much the products of
natural laws as dreams and spectra.
In such a theory there is no possible but
the actual; and man's highest ideals
of truth and righteousness are as hollow
as the interior of a dream.
Again, a mental activity is required to
account for the unity of consciousness.
Physiologically the sensory and motor
centres in each the cerebral matter of each
brain, when one hemisphere of the
brain is removed sensation and motion
are abolished unilaterally on the opposite
side of the body. But consciousness is
one. This proves that the physiologically
activities of the brain are not co-extensive
with its psychological activities.
Again, amidst all the flow of sensations,
thoughts, imagination and belief, consciousness
is one. Except as united to the unity of
a consciousness, they fall asunder as
separate and isolated facts.
Memory, moreover, would be impossible,
but as the act of a conscious agent.
The recollection of sensation does not
constitute memory.
Connect the present with the past—the mind must locate for itself that past in the past, without an abiding subject, such an act would be impossible. Physiology teaches that the body continually changing, atoms and molecules come and go; but amidst all this flow and change, there must exist a conscious subject which shall be able to unite the present with the past.

I now pass to the consideration of space.

I do not consider at present the genesis of this idea but its nature. Is it an ontological existence independent of mind or matter, or is it a form? Intuitively, the former view is still held by common sense. Space is regarded as an existence sui generis, independent of things, and capable of conditioning things.

To this view, however, there are very serious objections. If existing as a thing capable of conditioning things, then it must desert itself a distinct factor in being. If another space would be required to contain and that, were the act led to a dispensation at infinitum.
On the other hand, if it does not condition being or reality, how is it possible to know if it exists? A thing that does not act, that does not assert itself as a distinct factor in being is equivalent to nonentity. Such a thing it is impossible to know.

If space, moreover, is an existence or thing it must exist in its integral parts. These parts therefore must be capable of conditioning each other, that is, dynamically determining each other. Accordingly, and extended thing cannot be a unit. Only that is a unit which asserts itself as a whole in each of its states. Such a mental subject, when the soul thinks or wills or feels it is the whole soul that does so and asserts itself in each of its states. Spatial properties such as matter, whole, high or low, do not belong to such activities.

The same argument applies to the Divine Being, if space is regarded as a reality. If the Divine Being fills space, these spatial properties must be predicated of the Divine Being.

Many philosophers do not perceive it as a self-independent principle, which they regard as an existence. 

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and incapable of determining things dynamically. There are space, time, and as independent, however, they are incapable of interacting among each other, and therefore of determining each other. As the universe is a system where every thing is in interaction, these principles, independent, are useless for explanation. Accordingly, space can only be viewed as a form of intuition; it is a reflective form, not an ontological being existing objectively.

Here it will be objected by a disciple of the philosophy of natural science that the denial of an objective space conflicts with a primitive intuition that all things are seen occupying space in an act of immediate perception. Such an objective might pass in former times, but the advent of modern physics and physiology utterly disconcerts any such ideas. In a quotation from Prokofiev's theory, we see that between the external world and mind there exists the nervous system. Things acting on the sensory organs originate there a nerve impulse which passes along to the brain, where they are interpreted into their mental equivalents. Such an act of interpretation would be impossible apart from a mental
subject. Now if space did not upon the sense organs of the sensory nerves, and thence originate a nerve motion to the brain, there would still be required a mental principle in order to interpret these space movements back into their spatial equivalents. But it is admitted by all that space does not act. Only things act. Accordingly, space must be the form of consciousness by means of which the mind represents to itself the activities of things acting on the sensory organs.

It is now generally admitted that sense qualities - colour, sound, sound, &c. - have only a subjective existence in mind. Objectively they are represented by certain modes of motion.

So, with moral and intellectual principles. They exist only in mind.

If there is one reason for selecting space as a mental principle.

Time. - Time is regarded by many as an existence prior even to independent reality or being. As such, however, it could not come into interaction with being, nor even condition those activities of thing
If time, present, past and future be regarded as existing, and things existing in time are suddenly alight upon the Eleatic concept of being, according to which being is regarded as changeless. On this theory, change would be subjective to the observer and due to the limitation of his knowledge. Accordingly, time must be regarded not as independent but as dependent on being or reality. It is but the subjective aspect of change.

Causation.

Aristotle recognized four kinds of causes - material, formal, efficient and final; but, for our present purpose, it is only necessary to treat of two, that is, scientific and philosophical causation.

From the time of Aristotle the discussion of causation has proved a quasicontroversial and around which there have arisen innumerable controversies regarding its nature. Peripatetic philosophy was but the logical outcome of the sensational philosophy of his day. Upon the principle of sensationalism, all knowledge was limited to the senses, and therefore to phenomena. Its consequence
was phenomenalism. On this basis some
irrefragably proved that Causal efficiency
was no object of the science; and by
excluding every avenue of knowledge and
the sciences, Causal efficiency was
relegated to the limbo of obscurity.
As a student of science, however, deals
only with phenomena, such a limitation
of the field of knowledge is simply
invaluable. In past ages science
the progress of science has been so much
hindered by the futile effort to obtain
a knowledge of imaginary causes that
it is no wonder that the successful
and sagacious investigator of nature
should angrily and contemptuously
fling aside whatever interfered with
his vocation.

But man's reason cannot rest
satisfied with the knowledge of phenomena,
and the laws which regulate phenomena.
These are methods or modes of working,
not causes. But reason from its
very nature demands a cause to account
for these modes or causes of phenomena.
Such a demand is imperative; it
belongs to the nature of reason itself.
Accordingly, the methods of science are
incompatible of satisfying
Knowledge demands reason. This demand arises from man's consciousness of power.

Man is conscious of power. His consciousness is colvalent with consciousness of existence. "I am" is inseparably associated with "I can," with the fact, however, science has nothing to do. Does science first control with phenomena alone?

On the contrary, science postulates "force" as the cause of phenomena, and the various rhythmic movements of the universe. Force, however, is not an object of the senses, and therefore not of science.

In Newton's time there seemed to be an insuperable barrier between imponderable mechanical force and molecular forces. The discovery of the great law of the conservation of energy bridged across the gulf, and established a common measure of value between the various forces. Joule of Manchester discovered the mechanical equivalent of heat, and now the various forces are found the capable of transformation. Mechanical energy into heat, heat into electricity, and electricity into light. Force in the nexus by means of which the scientist binds into a unit the
harmonious and rhythmic activities of the universe.

Matter moreover in its ultimate nature is in inseparable to science as force. The various qualities of matter as known to science in due to certain 'modes of motion' heat, light, sound or all 'modes of motion' of the atoms which are regarded as the Causes of sensations in us. Divested of these modes of motion what is left? It must needs be a bold speculator who would maintain that the facts resulting of analysis, would prove a sufficient causes of the Universe.

In its primal analysis, science falls back upon matter and force as explainers of the Universe. But, as it is utterly impossible for science to explain their ultimate nature, it is necessary to turn to another source unknown to science for an explanation. That source is Consciousness, which alone reveals the real nature of force in power or causal efficiency. Hence it is that science is inevitably led to refer the phenomena of the universe to a personal force or originating source.

The insufficiency of the scientific idea of causation is well shown by W. Mill's dissatisfaction with the definition of Cause.
"the antecedent which it (i.e., effect) invariably follows. Not only must a cause be the invariable antecedent, but it must be the unconditional invariable antecedent. Upon this improved definition, Professor Laurie has made the following trenchant criticism: "If by the word conditioning Mr. Mill means merely to signify the true antecedent as opposed to many possible antecedents or the crude antecedent of the Nelsun, he manifestly gains nothing or refutes Causality. If on the other hand he means by the word Conditioning that there is something more than true time sequence, he is endeavoring illegitimately to.post in Causality in the sense of effectuating power and necessary effect, and then he gives up the sensationalist position altogether, or confesses his failure to explain Causality."
that the whole universe is made up of empty space and eternal atoms, differing only in form (as A and N) order (as AN and NA) and posture (as Z and N). The atoms are endowed with a primitive motion in virtue of their weight, and clashing together produce vortices, from which the world is formed. The gradual process of the whirl of atoms brings diverse elements together, as in the setting of grains, and as the atoms are sifted into groups.

"The great weakness of this theory lay in the very false idea, then held, of the nature of motion by weight, which was supposed to be necessarily in parallel lines, and with a velocity greater for heavy than for light bodies. The difficulty which arose from this notion led Epicurus to give the atom a perfectly arbitrary and capricious movement, as well as the rectilinear motion due to their weight, and then, in his belief, the theory really became a metaphysical one, reducing the order of the universe to pure chance."

But Professor Tait, as we have seen, refers to metaphysics to prove that the atom is a substance. Whether such a
presupposes the order of the universe to pure chance" remains for Professor Tait to determine.

Modern science discards the word and in its place there are substituted the various forces. The atom is retained as a "solid, massy, hard, impenetrable, moveable particle." Since Newton's day, science has proceeded as familiarly with Cleavis affinity and the various molecular forces which are capable of transforming one into the other.

This raises a very puzzling question. In what relation does the hard, massy, impenetrable atom stand to the various forces? On the other hand, how is it possible to locate the various forces, each of which is convertible into the other, in the hard massy atom?

Raubericht attempted to solution by dispensing with the hard massy atom, and regarding it as a "centre of force." The vortex theory of Sir William Thoms (now Lord Kelvin) regards the atoms as vortex rings generated out of a perfect fluid filling all space. As the fluid itself must be composed of atoms, this theory may hardly be regarded as satisfactory since
it simply postposes the question regarding the existence of the ultimate atoms of the perfect fluid.

Modern chemistry, in ultimate analyses, resolves matter into more than 60 elements—carbon, hydrogen, oxygen, etc. Each of which may be regarded as a distinct species. But speculative chemists have ventured further, and have proposed that the 60 elements are composed of an ultimate atomic unit viz., hydrogen. None of these theories, however, is capable of affording a solution of the problem. It has been distinctly noted that each scientific specialist regards the atomic thing only in so far as it explains the facts connected with his own department of science. Thus, the chemist endows the atom with the forces of chemical affinity and repulsion, but is not required to consider the theory in relation to the other sciences. The physicist endows the atom with the forces considered in relation to the biological sciences. The astronomer regards the atom as powered by the universal force of gravitation. None of these theories can be regarded as any other light than a "representative fiction."

as Professor Bain says of the atomic theory. It is intended simply to represent the facts, and render them more apprehensible by the imagination. When, however, the atomic theory is put forward as explaining the Cosmos, it is absolutely necessary to combine these heterogeneous ideas into a consistent unity.

The Representative Character of the atomic theory is clearly stated by Professor Crooke. "I wish to declare my belief that the atomic theory beautiful and consistent as it appears, is only a temporary expedient for representing to the mind of Chemistry to the mind. Although in the present state of science it furnishes absolutely essential aid to investigation and study, I have the conviction that it is a temporary scaffolding around the imperfect building, which will be removed as soon as its usefulness is passed."

According to the Atomic theory, the atoms are not in contact; the atomic molecules are atomic depictions in miniature. Wurtz says, "we have sound reason for comparing the little world in which the atoms are rotating to the great world in which the stars revolve."
again Cauchy says, "Amperé has shown that the molecule of different bodies may
be regarded as composed each of small
particles whose dimensions are
small relatively to their separative
distances. If these were could see the
different bodies brought under our
observer they would present to our view
sorts of crystalline; and in passing from
the infinitely great to the infinitely small
we should find in the ultimate particles
of matter as in the immensity of the
Heaven's central points of action
distributed in presence of each other."
here accordingly a puzzling
question arise. If these atoms are
separated from each other in empty
space, how are they able to act at a
distance? To explain vision an
ethereal medium filling all space is
assumed, whose vibrations, acting on
the retina give rise to vision. This
is done on the supposition that vibrations
Could not take place in vacuo. But
if the undulatory theory is required
to account for action at a distance

"light", says Professor Jeans, "in spite
of its extreme velocity, shows much
respect to matter, for it is almost stopped by opaque substances, and to a considerable extent absorbed and deflected by transparent ones. But to frank, all media are as if they were absolutely transparent, may own existent; and two particles at opposite points of the earth attract each other exactly as if the globe were not between. The action is so far as we can observe instantaneous. So that every particle of the universe is at every moment in a separate capacitance as it were of the relative position of every other particle throughout the universe at that moment of time. Compared with such incomprehensible conditions, the theory of particles deals with commonplace realities. Newton's celebrated a priori hypothesis vanishes, bears the appearance of irony, and it was not without apparent ground that Leibnitz and the continental philosophers charged Newton with reintroducing occult powers and qualities.

Le Cae of Geneva attempted an explanation of gravitation. Professor Tait says, 'He assumes the existence of ultra-violent corpuscles; in infinite numbers seen compared with those of
the particles of matter, of dimensions excessively small, but flying about in all directions with velocities enormously great. Portions of four matter virtually screen one another to a certain extent from the pressure due to this perpetual rain of corpuscles; but only in the sides turned toward one another. Since a line body would be equally battered on all sides, but the introduction of a second mass interferes with this arrangement, and diminishes the pressure on the next side split. It is easy to show that the amount of this diminution for four small masses is inversely as the square of their relative distances. But when larger masses are taken account of, the diminution of pressure will not be (as gravity is) directly as the matter present unless the further assumption is made that matter is permeable to the corpuscles, so that practically the corpuscles rain upon each other without the interior particles of a mass a particle of air if it had been alone in space.

In remarking on this theory Professor Tait truly admits that ‘long after
Postulates of this theory are: land & granted, and there is additional difficulty as to the mode in which the supply of energy, of the corpuscles is to be kept up.

Le Sage's theory suppose, that the action in distant of gravitation is not so intelligible as action by impact. Accordingly, ultra-mundane corpuscles are assumed to account for gravitation by impact. But the only mundane corpuscles which the Chemist knows do not act by impact. As we have seen from the quotations of Wurtz and Cauchy they act at a distance: Chemical attraction and repulsion must take place at a distance. If so, Le Sage's theory is a fantastic hypothesis.

But Professor Tait is still more unfortunate with his own theory. To prove the substantiaity of the atom, he must needs fall back upon metaphysic while. In his own words, he opens completely "blasted the already promising career of a physical inquirer." To prove the substantiability of his "mundane" atom, he must needs fall back upon an "ultra-physical" belief. Well might the disparaged so-called metaphysical retort "If I have to..."
you earthly things and you believe not how shall you believe if I tell you heavenly things?"

The following remarks of Mr. Martinian on the atomic theory seem to me so appropriate, and clothed in language so much eloquence that I cannot resist quoting them.

"To suppose that by pulverizing the world into its least particles and contemplating its components where they are most in nothing, we shall hit upon something ultimate beyond which there is no problem in the strongest of illusions. There is no magic in the superlatively little to draw from the universe its last secret. Size is but relative, magnitude or swindled by a flaw. Variable with the orison of perception: to one being the speck which only the microscope can show us may be a universe; to another the other system may be but a molecule; and in passing from the latter to the former you reach no end of search or beginning of things. If in imagination you simply recede from the micro to the molecular form of body you carry with you by hypothesis.
all the properties of the whole into the parts
wherefrom properties, and merely
substitute a miniature for its life-size
without in the least hindering the
feats which may come. On the other hand
you drop attributes from the man in
your retreat to the elements; on your return
you can once again pick them up again;
leave your atom down to a cold, geometrical
perfect minimum, and you have parted
with the possibility of feeding it up to the
qualities and plenitude of actual mental
forms; for in mere pictures - which
in all that is left - you have no new
properties, only the power of excluding
attitudes, competes from its place.

All these difficulties arise
from ascribing independence to the atoms
and locating in these forces which act
independently on their own account. The
independent atoms do not explain the
independent forces, nor do the independent
forces account for the atoms. The only
difficult way out of the dilemma is to deny their
independence, and reduce them to a dependence
upon the basic unity who, as intelligent
and self-conscious, is capable of regulating
the discrete to activities of the many.
It is only such a being that is capable
of originating activity, and asserting itself as a distinct factor in existence. In such activity, the atoms can have no claim as destitute of subjectivity, and therefore of asserting themselves as distinct existences, all their activities are determined objectively. As interacting in a single universe, they are all dependent upon the basic power who is self-conscious and intelligent. To use the words of Professor Rowe, they are a series of related activities in the infinite such that they produce for us the appearance of a world spatially discrete.

Does this view deny the realities of the atoms? Yes, as ontological entities or things; but not as phenomenal of the activities of the infinite. Nor is such a view of regarding the atoms without analogy elsewhere. The astronomers cannot at times help using phrases as the sun rises, and acti-phrase expression of the geocentric theory of the earth. But when the question arises is it true? the answer can be only in heliocentric terms.

Laws of nature. Among the series of related activities on the part of the
Infinite there are certain uniform modes of procedure. These are termed laws of nature, and are abstractions indicating the way in which the real world, or, as the case may be, the Infinite Being acts. They are not ontological necessities determining the course of things, but simply modes of activity or re-arrangements.

As has happened, however, with space-time, and the atoms, the laws of nature have, by some, been regarded as ontological necessities which determine being, and to which all reality is subjected. According to them, it is said that laws of nature are absolutely necessary, and cannot be broken. This viewpoint is a complete subversion of the truth. It is not laws of nature that determine things, but it is the mode of activity of things that determine what are laws of nature.

This view is criticized by Professor Jevons as follows: "Pindar speaks of law as the rule of the [bleed cut]."
acted since the world began, and will act
for evermore. Even of the origin of all things
is attributed to an intelligent creative
mind. That belief is founded on a being
yielded up arbitrary power, and as much
subject like a human legislator to the
laws which he has himself enacted.

Our notions should describe as
superficial and erroneous, being derived
as I think from false views of the
nature of scientific inference, and the
degree of the certainty of the knowledge
which we acquire by inductive
investigation.

"A law of nature, as I regard the
meaning of the expression, is not
a uniformity which must be obeyed
by all objects, but merely a uniformity
which is as a matter of fact, obeyed
by those objects which come under
the scope of our observation. There is
nothing whatever incompatible
with logic in the diversity of objects
which should form exceptions to
any law of nature. Perhaps the
least established fact is that which
asserts an invariable correlation to
exist between gravity and inertia
so that all gravitational bodies are
found to possess inertia. and all bodies possessing inertia are found to gravitate.
But it would be no reproach to our
scientific method if something were
ultimately discovered to possess inertia
without inertia.

"It is just the absence of necessity"
says Dr. Martinica, "that compels us
to resort to empirical methods, and the
fundamental principle of induction is
that what in point of fact thought has
become settled and uniform is in point
of thought, alternative or contrary. Yet
strange to say it is chiefly by the first
Champions of the inductive method, while
insisting on it as the supreme oracle of
truth, that the proclamation of
universal necessity is most emphatically
made. They wait upon experience
to believe in the uniformity of phenomena
thus acknowledging that it is unguaranteed
in the nature of things; yet treat with
contemptuous impatience every idea of
an alternative possibility. They thus
confess by their method what they
deny in their conclusions."
Philosophy of Mr. Mill.

Before treating of Physiological Materialism, it will facilitate an understanding of the subject to take up first the Sensational philosophy; and, as Mr. Mill is the ablest representative of that system, to this exposition.

In our experience there are two orders of mental movement, one is rational; the other is experience. In the rational, the order is necessary: in the other, it is contingent. In reason the truths coexist as the truths of space coexist in the axioms and definitions of geometry, and are rendered explicit by deduction. The truths of experience are contingent, and to establish them reason must be employed in induction and experiment.

The great aim of reasoning and speculative philosophy is to reduce the truths of experience to those of reason, so as to render them capable of deduction. This was what Spinoza attempted. From the idea of ultimacy he attempted to deduce not only the truths of reason, but also of experience.
his great aim was to render dynamical efficiency coincident with the capacity of thought. This pretension attempts cannot be done. Substance is a generic term, and it is impossible by mere deduction, to apply it as specific attribute of things; to do so, resort must be had to the inductive method. The attribute added to the generic term while increasing its comprehensiveness decreases it entrenches.

Moreover, Substance is a relative term, as there can be no substance without some attribute. Pure space is single and absolute, and contains general predicates. It is infinite, and possesses three dimensions, out of which can be formed the various geometrical figures. Since it is that space is able to take its part in a deductive science.

The attempt to reduce dynamical efficiency to logical capacity also proves a failure. In dynamical efficiency there is causal efficiency for which there is required a cause. In logical capacity there is no idea of cause. Hence the totality causing in the very nature of reason. In the one case you have
Mr. Mill's philosophy stands at the opposite extreme to that of Spinoza. Out of contingent elements alone, he attempts to account, not merely for the truths of experience, but also those of reason such as Space, Causation, &c. This is done by "the Bruno and approved rational methods of physical science adapted only to the necessities of psychology.

Considering the intense dislike which Mr. Mill manifests towards a priori truths, and his terrible onslaught on Sir William Hamilton, the greatest representative of that school of thought, it is startling to find him maintain that the "psychological theory" is founded on certain postulates. The postulates are as follows.

1. "It postulates that the human mind is capable of expectation."

2. "The laws of association. (a) Similar phenomena tend to be thought of together. (b) Phenomena which have either been experienced or conceived in close antithesis to one another tend to be thought of together. The antithesis in kind- Simultaneity and immediate conclusion."

3. "Association produced by antithesis"
"become more certain and rapid by repetition."

(4) "when an association has acquired the Character of inseparability - when the bond has been thus firmly riveted not only does the idea called up by association become in our Consciousness inseparable from the idea which suggested it, but the fact or phenomena answering to these ideas, come at last to seem inseparable in existence."

These postulates he says are "all proved by experience." This is another postulate which he accepts, and which he frankly states is incapable of proof: it is a "practical inseparability," that is memory.

"since the fact which alone necessitates the belief in an ego, the one fact which the psychological theory cannot explain in the fact of memory (for expectation I hold to be both psychologically and logically a consequence of memory) see no reason to think that there is any expugnance of an ego until memory ceases."

The psychological theory which he approves of so highly as the scientific method is found after all to possess "intrinsic difficulties" which beyond
the power of metaphysical analysis to predicate.

But what are "memories and expectations?"

"In themselves they are present feelings, states of present consciousness, and in that respect distinguished from sensations. They all resemble present some similar sensations or feelings which we have previously had experience. But they are attended with the peculiarity that each of them involves a belief in more than its own present evidence.

"If, therefore, we speak of the mind as a series of feelings, we are obliged to complete the statement by calling it a series of feelings which in aware of itself as past and future; and we are reduced to the alternative of believing that the mind or ego is something different from any series of feelings or possibilities of them, or of accepting the paradox that something which is hypothesized is but a series of feelings can be aware of itself as a series.

The postulate that the human mind is capable of expectation is capable of "proof by experience." But "expectation," which is "psychologically and logically a consequence of memory," must therefore be founded upon a "spatial, inexplicable, sheer expectation," must therefore have a "spatial inexplicability."
This is truly a humiliating confession to make. The great psychological law, approved by the most advanced scientific thinkers, and which has formed as patent as instrument analysis in analyzing the idea of space, cause or has now come to an utter dead-lock in presence of memory, it helplessly and hopelessly paralyzed. Yet, still does not hesitate to say that "the best masters" of the psychological law have used it as the "principal instrument for unlocking the deeper mysteries of mental science." It has been "employed by thinkers of the highest order as the most potent of all instruments of psychological analysis." Yet "the best German and French philosophers are barely aware, if even aware, of its existence."

Nor does this comprise the full extent of Mill's incoherence. Dr. McColl charged him, when outlining one conception of Matter into Resistance, Extension and Figure together with miscellaneous powers of excite other sensations, this "there is a palpable omission here, for it omits those powers by which one body operates upon another; thus, the "shaking a power to make wax white and fire to make lead fluid." To this
Chance M. Mill replies. "Dr. T. H. Huxley had entered even a very little way into the mode of thought which he is combating, he must have seen that, after mentioning the attribute of exciting sensations, it could not be necessary to add that if something else exciting sensations, if body altogether is only conceived of as a power of exciting sensations, the action of one body on another is simply the modification of one such power after sensation excited by another; or to use a different expression, the joint action of two powers. If exciting sensations. In order to know that one body is capable of modifying the action of another body, it is necessary to differentiate the body from the ego.

"It is easy," says Mill, "for any one competent to such enquiries, who will make the attempt to understand how the power of modifying of sensation can be conceived as destroying or modifying another sound source." It must therefore be "easy for any one competent to such enquiries to differentiate the possibilities of sensation from the ego. M. Mill have seen Dray, since the facts which alone necessitate the steps..."
the one fact which the psychological theory cannot explain is the fact of memory.

I see no reason to think that there is any 

explanation of an ego until memory 

commences. Mr. Mill elsewhere refers 

possibility of sensation as "instances 

transcending sensation.

If amongst "instances transcending 

sensation," it is easy for any one 

competent to such enquiries, to explain 

how one possibility of sensation can 

modify another, it is surely easier 

to explain the "modifications" which 

take place amongst the phenomena 

that do not transcend sensation; that 

is, the phenomena of the ego. Yes. 

It must be easy for any one competent 
to such enquiries to explain memory, 

that is, a "final inexplicability.

It is all the more astonishing that 

Mr. Mill should consider memory 

a final inexplicability, because for certain 

the greatest difficulty with philosophers 

was to understand how mind and 

matter could interact. Yet Mr. Mill 

coolly informs his opponents that 

"no such difficulties (as those connected 

with memory) attend the theory in its 

application to matter. But for 

autistic
the fact difficulty was how to bridge across the apparently impossible gulf between mind and matter. Their reason for doing so was, they thought, that "like only can know like." It is in deference to this philosophical credo that they have expressed, "according to Hamilton, "the unitarian system of identity, materialism and idealism." Mr. Mill now simplifies, reverses the estimate of the philosophical difficulties which the remainders of the great thinkers of the past as final. To such difficulties added the psychological theory, but, curiously enough, that the ego knows the part contains a "final inexplicability."

There is another point connected with Mr. Mill's theory, and it is matter astonishing that "the best masters who have used the psychological law as the principal instrument for unlocking the deeper mysteries of mental science", should overlook it.

Mr. Mill admits that amongst the "existences transcendental sensation", one possibility of sensation can modify another. The idea of causation power is a derivative activity, "became connected not with sensations but with groups of possibilities of sensation."
But sensation belong to the perceiving of our nature, not the activity. So it does not.

Mill: Will obtain the idea of causation, power or activity at all? Sensation are "passive, variable, and alternately displaced one another" from each passive and variable phenomena it is impossible to obtain the idea of causation, power or activity.

Mr. Mill takes Mr. W. Hamilton severely to task for maintaining that the proof of the reality of CONSCIOUSNESS in the veracity of the Creator, and, on the other hand, of maintaining that the Creator's veracity rests on the trustworthiness of CONSCIOUSNESS. "We are bound by the laws of correct reasoning," says Mill, "to prove his premises without the aid of the conclusion which he means to draw from it." Mr. Mill declines the possibility of sensation that is "existence transcendental sensation," from sensations and their laws.

Hume: "Causation "power "activity" are those derived from the permanent possibilities of transcendental sensation. With such a flagrant instance of Petticoat Principle, Mr. Mill will find it a difficult to convince his readers that the he.
psychological law is "the principal instrument for unlocking the deeper mysteries of mental science."

Indeed, when pushed to an extreme, St. Hilaire's philosophical system leads to conclusions far grotesque a character as to appear crude. The following illustration will prove convenient. "The candle at which lace-looking produce in one certain sensations of light, colour, and shape. On the psychological theory that comprises two elements: sensation and possibility of sensation. The possibilities overcome are the cause of the sensation. "Now, it is possible," as Mr. Balfour says, "to imagine a being so endowed that he could perceive at no moment, every quality of the candle, which, would, in that case, it is evident, exist entirely of sensation, the possibilities of sensation being converted into actualities."..."Now it would be clearly erroneous to say, such a being that the immediate causes produce the sensation, which constitutes the perception of the candle were permanent possibilities of sensation. Since by hypothesis the possibilities were all converted into actualities,..."
it would clearly be absurd to say that these sensations were self-caused; and it would be altogether impossible to say that they were not caused at all.

As Mr. Mill maintains that sensations are "fugitive, variable, and alternately displace one another," such a candle in moment of clearest knowledge should disappear altogether; or, if it did exist, it would be an a priori illusion as incapable of objective proof as the hallucinations of the delirious.

It is clear, therefore, that Mr. Mill's great psychological work proves itself incompetent to unlock the deeper mysteries of mental action. It accounts merely for the secondary laws of association, and these are quite as effective in producing beliefs that are false. If so, the question arises how separate false beliefs from true beliefs? For a belief to be rational, must be based upon rational grounds; and it is philosophy that investigates the ground of knowledge and belief.

"The first problem of philosophy," says Hamilton, "is to seek out purity and establish by intellectual analysis and criticism, the elementary feelings.
or beliefs in which are given the elementary truths of which all are in possession.

These are the truths of space, causation, personal identity, etc. Mr. Mill has made a vigorous attempt to show how these can be analyzed into elements and their laws, and satisfies himself that he has succeeded in oversounding what he terms the introspective philosophy.

We have seen, however, that he not only admits, but has been compelled to admit a "final inexplicability" in the case of memory, what then constitutes a "final inexplicability"? Hamilton I presume, would not hesitate to call the "elementary feelings or belief" by the same term. Inasmuch as they are incapable of further analysis, and consequently, must be taken as postulates implied in every act of knowledge, Mr. Mill's system has therefore forfeited the claim to a philosophy, if it is simply a psychological system capable of accounting for false as well as true beliefs. The question how to separate true beliefs from false? he entirely ignores; while his unfortunate admission that there is a "final
inexplicability in Knowledge distinctly proves that the question he puts is one which cannot be dispensed with, and one which lies beyond the bounds of his psychological law.

Materialism.

In his "Elements of Physiological Power," the position between these, the question between Materialism and its Opposed Views, two opinions are entertained in regard to the action of the brain. Both agree in considering that the brain is the instrument of all the higher mental or intellectual functions. From the one point of view, however, it is stated maintained that the nerve cells are accumulated to form centre centres, the definition of which is indeed obscured by the complexity of the communications between themselves and between the centres situated in various places, as those of the brain cerebral ganglia and the ganglia of the medulla and spinal cord, but which act like other centres in a reflex manner to stimulate the effect from without or from within, from the other
point of view, it is considered that, although the brain is considered physically a part of the nervous system, it is the organ through which the mind of man exercises, as having altogether superior functions to any other part of the nervous system, operating as a whole, directing and controlling all the lower centres. It is regarded as the organ of will which acts in a mode that is incomprehensible indeed, but which is evident through the cerebral cells.

"The difference of opinion in regard to the mode of action of the brain between physiology and metaphysics is analogous to that which exists between materialism and spirituality.

"From this point of view (in the materialist's) there is no such thing as free will. The acts and thoughts of a man are the result partly of original and hereditary constitution, partly of the direction of his own occupation and pursuits; and were it possible for us to know the whole antecedents of the individual it would be possible to predict what his conduct would be in any given crisis."

According to the materialistic position, therefore, the whole psychical phenomena are included within the
bounds of physics, a celebrated representative
of materialism, Dr. Kekulé of Jena, distinctly
maintains this position. "A creator for
him is a conception for science, and he pours
unceasing contempt upon the thought that
we, or any few are more than material
organisms, alive for our little day and
dead for ever." "It is moving matter which
by self-operation through immeasurable
duration has issued in laws that exist
without reason, and devoid of an origin,
act, with the cleanness of the rock, and
the unconsciousness of the sea."

The materialist, of course, supposes that
the theory of the localization of the functions
of the brain supports his conclusions.

In discussing the merits of this
theory, it is to be distinctly noted that
I do not call in question the practical
importance of this theory, physician in
localizing the different brain functions,
but only in regard to the truth it contains
in accounting for psychical phenomena.

It is quite possible for a theory to be
invaluable practically, but of no importance
philosophically, when put forward
as explanatory of the Cosmos. This is the
case with the electric theory of the earth.
In mid-ocean the Captain of the

"take the sun in order to determine his position at sea. If asked why he does so, he will probably explain his action
in terms suppressing the geocentric theory
of the heavens. The sun rises to the
meridian at noon, and afterwards sets
at the horizon. If, however, out of mere
enthusiasm for his profession, such
a captain tried to explain the movements
the heavenly bodies by that theory, he
would certainly be laughed at: to do so,
one must fall back upon the heliocentric
theory of the heavens.

It is precisely the same with
the theory of the localisation of the sun.
For practical purposes
it is simply invaluable, when
however, it is put forward as
explanatory of physical phenomena
it meetsstantial the fact.

Before criticising the theory, there
is an important preliminary consideration
I ask for. That is, the conclusions drawn
from this theory must not conflict
with those established to in other
Principles of

Department of Science. "It might not be
the irreconcilable with the principle basis
of motion, of gravity, of the conservation
of energy, nor any part of physical
It's unclear what the text in the image is trying to convey. The handwriting is difficult to read and the content appears to be a mix of random sentences and words.
must be capable of transformation into immaterial, and immaterial into material. Nor is it possible to escape this conclusion pain by denying the possibility of their correlation. This is to extract the mental from the material forces, and claim for them an existence sui generis. They belong to a different world from the physical, and incapable of being subjected to its methods of proof. Accordingly such a conclusion would amount to a disproof of materialism.

So refractory, however, are these opposite phenomena that it is now agreed by most authorities that they cannot be deduced from the obematerial phenomena in a single cataca. Accordingly, they have taken the bold step of locating them in a single atom. "The one substance," says Mr. Bain, "with two sets of properties, two sides, the physical and the mental — a double-faced unit — would appear to comply with all the necessities of the case."

This is certainly a daring feat. Mind and matter as known are separated from each other by material and immaterial properties. According to his own admission, material properties are all about in
mind; and mental properties are all about in
matter; but this difficulty undoubtedly can be
resolved by going back to the ininitesimal
atom.

But this step raises serious
difficulties, as Professor Tait says “It is
not as much the premise as the conclusion
of this school to which we object, for
let us consider what is implied in the
astonishing inference that the atom
is the true abode of immortal life in
the universe, and that its life is of
an extremely simple kind.

It implies, in the first place, that
the atom is eternal, and to this we
object. It implies, in the next
place that the atom is extremely
simple in its Constitution, and to this
we object. It implies, thirdly, that
for the cetistacts of the motions of the
atom it is unnecessary to resort to
anything beyond the atom itself
and to this one object.

Again, life is known only in connection
with protoplasm. This compound is
Dallinger’s “cleat, colourless, and to our finest optical
resources, devoid of discernible structure
p. 247. There is not a living thing on earth
but possesses its life in protoplasm from a microscopic fungus to man. Dr. Henry Dale says, "in all living beings the matter upon which existence depends in the form of living matter and in all living structures the form of living matter possesses the same general characters although its powers and the results of its life are so very different. But a conditioned living thing proceeds only from a conditioned living thing. That dead matter cannot produce a living organism is the universal experience of the most eminent physiologists. In fact the law of biogenesis is justly regarded by Prof. Rayner and others as the great principle underlying all the phenomena of organised existence. Dr. Bain's theory conflicts therefore with the well established law of biogenesis.

But what proof have

Dr. Bain of the atom as a "double-faced unit"? According to modern physics the atom is in incessant vibration. A differential equation which, algebraically written out, would heal the earth, is integrated in a twinkle. But does Dr. Bain's "double-faced unit" take
part in these vibrations? how can he prove it? the vibrations of the modern atom are communicated to the ether, through which they pass or remain. vibrations, does dr. bain's double-faced unity do so?

if dr. bain's theory were true it must inevitably follow that his "double-faced unity" must exist in the fire of the sun. so inevitably does the inference follow that the late professor lyell declared that, by an intellectual necessity, he declared there were shakespeare's "potions in the fires of the sun." it is certainly a remarkable fact that when the advancing tide of knowledge replenished salamanders to the kindred of myths and fables, speculative scientists could detect them existing in the fires of the sun. nor is it a less remarkable fact that the eminent scottish philosopher from aberdeen should commit himself to the theory which necessitated the existence of salamanders.

"his 'canny' eye in a bright freugh rolling, date flames from heaven to earth, from earth to heaven; and, an imaginative body forth" "the forms of things unknown, his 'canny' pen" "turns them to shapes, and gives a local habitation..."
"To solar salamanders, potential in the sun."

But even granting the truth of materializing brain function, the theory of the localization is far from being proved, and therefore of being regarded as a deductive hypothesis.

The chief facts in favor of localizing different functions in different parts of the brain are:

1. The proof given by Fritsch and H. Physiology, 1870, that the cortex of the brain, p. 527, responds to experimental stimulation, and that the excitation of certain different spots provokes certain muscular movements.

2. "The consequent detailed study by Ferrier, Allois Retzius, Horsley, Euen, Retzius, Baro, Golgi, France, König, Lecain, Fanzulli, Appelli, and many others—of the relation between cortical areas destroyed or stimulated, and resulting muscular paralysis or spasm."

3. "The scientific clinical study of epilepsy by Humphry Jackson, completed by post-mortem research of the seat of lesion."

4. "The association found to exist between aphasia and lesion of the left frontal pole."

5. The "localization" of functions.
As the result of innumerable experiments, Waller sums up as follows:

1. It is proved that the Rolandic area is motor.
2. It is proved that the occipital area is visual.
3. It is probable that the temporal area is auditory.
4. It is probable that the entire cerebral cortex is sensory.

These results are rather meagre, especially when used to support a materialistic theory of knowledge.

In regard to the localization of the sensory regions, Waller says, "But a localization of sensory regions - assuming that sensory impressions, like motor impulses, are centrally differentiated - is a far more uncertain question than the localization of motor regions; the former, left to the interpretation by opinion, by fancy or under the influence of preconceived theory - is very vague, and consequently many different opinions have been and are held concerning sensory areas."

Let us turn to the 'motor areas,' and see what physiology says in regard to these.

Facts depicted to the term 'motor center' at both of us, misleading. Since it suggests that the brain surface in a given area is largely occupied in giving rise to the Coordinated
nervous impulses which Carry out the movement resulting from the stimulation of the area, just as the respiratory Centre, for instance is occupied in giving rise to the Co-ordinate respiratory impulses; but it is absurd to suppose that comparatively large areas of such valuable material as we must needs suppose the grey matter of the convolution to be, should be taken up in so to speak merely to work, such as that for instance of discharging the nervous impulses required for bending or for straightening the arm. Besides, we know that an animal can be made to execute in the total absence of the cerebral hemisphere, the various Co-ordinate movements which result from the stimulation of the cerebral areas.

Waller also says: “Having recognized motor reactions as the effects of localized excitation of the cortex, we naturally ask whether the converse effects will be produced by local destruction of the same part; we might find a limb completely paralyzed after its cortical Centre had been destroyed. But this is not the case; the limb can be moved at first sight its movements seem..."
perfect, it is certainly not completely paralyzed, whatever defects there may be, is not up to the permanent; the apparent awkwardness soon wears off, movements seem to be re-learned; the clinical history of a dog which having been suffered a removal of some portion of the motor area altogether negative a strict localization of function while forcibly suggests its local concentration.

These quotations which are sufficient to show the tentative character of this theory do not touch the core of the difficulty with which materialism has to deal. Granting that certain portions of brain surface have different functions, do these portions of brain surface originate mental phenomena? Are mental phenomena the product of molecular changes in the brain analogous to bile or the product of the liver cells? Herein lies the core of the difficulty; and this difficulty is frankly owned by physiologists themselves.

Waller says: "It is a truism that psychological phenomena are the subjective symptoms of material sensitizing changes, but it is also m
undoubted fact that respiratory data, while remaining objective, cannot give rise to sensations that are larger, smaller, positive or negative, according as they are accompanied by other sensations that are larger, relatively smaller, larger, negative or positive.

"The term psychology 'judgment' belongs to psychology rather than to physiology, but in any account of the functions of the brain, it is not possible to escape the case of terms bordering upon or actually belonging to the domain of psychology."

"Consciousness in the subjective experience of each individual, we cannot physically describe the nature of the phenomena that it indicates; we simply paraphrase the term by saying that consciousness is the subjective aspect of objective material changes in the outside world and in the cell or of the Consciousness agent."

Here it is distinctly stated that the phenomena of psychology are different from those of physiology and cannot be described in terms of physics. This is all the conclusion I ask for. They are separate phenomena and cannot be described in terms of physics and hence contrary to materialism.
Physiology was originally an empirical science, that is, a science consisting of detached facts. But, in proportion as it allied itself, during recent years, with the collateral sciences of Chemistry and Physics, so far has it become a deductive or rational study. Experience has clearly shown that the more technical physiological phenomena are explained by the well-established laws of Physics and Chemistry, the more does it rest upon a secure foundation. Accordingly to establish the truth of physiological materialism, it is necessary to fall back upon the Atomic Theory of Chemistry. To maintain that mental matter is capable of originating mental phenomena, it is necessary to prove that matter is capable of doing so. In ignorance of the potentialities of matter, it would be impossible for the materialist to prove his quiescism. Hence arises the question what is the nature of matter? We have seen that authorities in Science look upon the atomic theory as a purely speculative fiction. This conclusion has not prevented speculative thinkers from raising the question whether matter consists of an ultimate...
unit such as hydrogen, or whether there are as many different species, as stated by Chemistry. "It is from an examination of the spectroscopic character of the elements at different degrees of temperature, that Locke has been able to obtain sufficient data to justify the definite formulation of the hypothesis that all the elements we find are really compounds, or, to speak more precisely, are really different forms of association of one kind of matter. According to this hypothesis, the matter of which the universe is composed was, at one time, equally distributed through space, and uniform in kind. The atoms then Coalesced in various groups of two, three, or more, and these again grouping themselves, still further formed aggregates of more and more Complex Composition. These aggregates are, it is deepened, the elements with which we are acquainted."

"The hypothesis has this advantage that it explains certain phenomena which have hitherto been very perplexing."

The hypothesis has this disadvantage that in the solution of mental phenomena it is simply fantastic. Now granting that in looking at an object, our sense of vision were so perfect that we could..."
see the ultimate, or this supposition all qualitative differences would disappear, and all the spectator would see would be homogeneous units (say of 1 kg) arranged in different clusters. These clusters would possess various geometrical forms and objects; but that would be all. To account for the qualitative differences, one has to fall back upon the nature of the mental object. This would mean that objectively there would be nothing but quantitative; qualitative differences would belong to mind or the mental object. Through sheer excess, this theory outruns itself and is forced to fall back upon idealism.

It either this theory or the ordinary chemical theory of the specific elements is capable of explaining the unity of consciousness. Consciousness in one through all the changes of mental and material change. It is the state of a mental object, apart from which it cannot exist. Nor this unit cannot be explained by material according to that theory the atoms are things of entities, and mind is phenomenal, with the disassociation of material molecules of the brain.
Such an hypothesis would meet the immediate need for an explanation of the evolution of our brain and nervous system. The nervous system is a complex network of nerve cells and fibers, each playing a specific role in the transmission of information.

For example, the central nervous system includes the brain and spinal cord, which process and coordinate information from the body's various systems. The structure and function of the nervous system are essential for the maintenance of life and the ability to process and respond to stimuli.

In summary, the nervous system is a complex and highly integrated network of nerve cells and fibers, each playing a crucial role in the transmission of information and the regulation of bodily functions.
generate the idea of the past. Accordingly such a molecule, when similarly constituted, should be able to generate the same idea at any time. But in the materialistic hypothesis, memory loses all connection with the past. Moreover, as the body is in incessant change, and as in the course of a few years the molecules of the body must be entirely different, so must the mental phenomena change with the changing material molecules, and memory must separate its connection with the past.

The supposition that a cerebral molecule generates an idea which is handed down to its predecessor raises a puzzling difficulty. The molecule not only generates an idea but hands the ideas of former years also to their successors. But how is it possible to hand down to posterity all the ideas that have passed through the consciousness of a lifetime? If even a slow, old man who has lived a slow old life for more than forty years. One would suppose that cerebral molecules had quite enough to do to attend to the generation of molecules of their own ideas and to content themselves.
in the unmanageable task
of transmitting ideas generated a few score years ago.
In the quotation from Dr. Waller it is said that "psychological phenomena are the subjective phenomena of material sensibilityal changes; but it also an undoubted fact that sensibilityal data while remaining objectively constant can still rise to sensations that are larger or smaller positive or negative according as they are accompanied by other sensations that are relatively smaller, larger, negative or positive. This is the doctrine of H. Spencer in his Principles of Psychology, that consciousness states are but the subjective shadows of brain molecules.

But the raises the question how is it possible from "subjective symptoms" to obtain a knowledge of the objective world? Light from the sun communicated a nerve motion to the optic nerve which thence passed to the brain. Encased within the skull, the molecules are in absolute darkness; but the brain molecule interprets the nerve motion as caused by the sun, existing objectively in space, nineteen miles of miles away.

Dr. Waller maintained that the brain molecule interpreted the subjective symptoms
in these ot the atoms composing the molecule the difficulty might not appear so real. But how can the molecule interpret its own "subjective symptoms" as that of the sun existing in space?

Dr. Waller is apparently unconscious of the difficulty, but in order to interpret psychological phenomena as depending on "subjectivity" he is inclined to place the relation between the two on the rational basis. Dr. Waller elsewhere states, "The idea of things in the mind of the most exact observer are no faithful copies of things in themselves, and in the consciousness of a careless observer depart in most extravagant ways from actuality, as they appear to a majority of normal men, in an insane person, or in an hypnotized person, the idea and the thing diverge to such an extent that the former becomes characterized as a hallucination or a delusion."

To separate a hallucination or a delusion from a true idea requires an objective standard. But how is it possible for Dr. Waller to do so? "Psychological phenomena," according to him, are but the "subjective symptoms of material occurrence".
"change," and if no objective standard can be had, then philosophical phenomena must be "characterized as a hallucination or a delusion."

Materialism

Such a theory, moreover, would destroy the fundamental difference that exists between the cause and grounds of belief. A belief may be viewed in two aspects: it may be viewed in regard to the cause which gave rise to it, or it may be viewed in relation to the grounds which justify it. If the belief has no rational grounds, it is irrational; if it has up or immoral grounds, it is an immoral one. But materialism obliterates the distinction between the cause and grounds of a belief and reduces all our beliefs to cause.

Thus materialism is important. A distinction one has to fall back upon is the relation that exists between will and intelligence. If an intelligence were destitute of freedom, it would not be possible to separate truth from falsehood. But if a man possesses choice, then it becomes possible either to use or to abuse that power. Take away this power of choice, then there is nothing but necessity, dire unrelenting necessity regulating man's intelligence.
On such a theory, all his actions are products either of his constitution or of his surroundings. His beliefs are caused and that too, of necessity. Institute of choice his actions, his beliefs, whatever constitute self, are but the products of necessary laws which prevent the possibility of choice. Psychological phenomena, on this theory, would represent nothing objectively but the subjective aspect of molecular brain processes. whereas, if they did represent an objective reality, it could only be maintained on the theory of a pre-established harmony.

When materialism comes to explain mind, it allies itself with an associational psychology. Here it starts with sensations and associated sensations. Then the habits and experiences of the parents are transmitted to their offspring. This, however, is to introduce a new first element, and it flagrantly conflicts with the fundamental principle of materialism. On these principles, the chemical attractions and repulsions express the inner nature of the chemical atoms. Chemical affinities are not acquired; they are inherent and essential.
Properties of the elements. Equally extented it be with vital and mental properties. They should express the inherent nature of the atoms. Therefore materialism has no right to appeal to heredity; habits and experiences are not hereditary; they are simply the outcome of the atoms.

On the supposition of a mental subject an acquisition of habits and experiences is intelligible, the mind grows in knowledge and wisdom; but not so the chemical elements.

A mental subject is therefore an indispensable factor in knowledge, apart from which knowledge is impossible. To explain mental phenomena by means of chemical elements is a grotesque absurdity, and leads to insoluble contradictions.

"Now it appears to us," says Professor Smith, "that we cannot have an impression more deeply seated or more impossible to suppress than this: that we ourselves exist and are responsible; it is something which we continually carry about with us, even into the grotesque region of thought, where all individuality is denied. It is into these regions that the materialists invite us to accompany..."
them in order to perform, or rather to delude
ourselves with the idea that we have
performed this singularly unhappy duty.

But just as we cannot conceive a man
swallowing up himself, so neither can
we conceive of his getting rid of his own
individuality by any legitimate process
of thought.

"Among all the errors of the human
mind it has always seemed true the strangest
that it could have to doubt its own existence
of which alone it has direct experience, or
take it at second hand, as the product
of an external nature which we knew
only indirectly, only by means of the
knowledge of the very mind to which
we would join any existence.

Professor Kurenley's Aposticism.

Considering his attainments as
metaphysician and physiological, Professor
Kurenley's views demand attention.
His aposticism influences his speculative
views very profoundly, and in my
apprehension very seriously.

The following is his own statement:
"for, after all, what do we know of the
terred matter except as a name for the
unknown and hypothetical cause of states
of our own consciousness? And what do
we know of that 'spirit' over whose termed
extension by matter a great lamentation is arising, I like that which was heard at
the death of Pan, except that it is also
a name for an unknown and hypothetical
cause or condition of states of consciousness?
In other words, matter and spirit are leaf
names for the imaginary substrata of
processes of natural phenomena.

Self and not-self are not immediately
observed facts, but results of the application
of the Law of Causation to these facts. Strictly
speaking the existence of a self and
not-self are hypotheses while we
account for the facts of consciousness.
The apostate principle may be stated in
various ways, but they all amount to this:
that it is unfair for a man to say that
he is certain of the objective truth of any
proposition unless he can produce evidence
which logically justifies that certainty.

"That to which Apatetics deny and
refute, as immoral, is the
Contrary doctrine, that there are
propositions which men ought to believe
without logically satisfactory evidence.
and that reprobation ought to attach to the profession of disbelief in such inadequately supported propositions.

"I suppose that as long as the human mind exists, it will not escape its deep-seated instinct to personify its intellectual conceptions. The science of the present day is as full of this particular form of intellectual shadow-worship as is thereece of the Middle Ages. The difference is that the philosopher who is worthy of the name that he is personified hypotheses such as law, and force, and ether, and the like, are merely useful symbols, while the ignorant and the careless take them for adequate expressions of reality."

"Off all the dangerous, mental habits, that which schoolboys once "cooperativeness" is probably the most perilous; and the inestimable value of metaphysical discipline is that it furnish a effective counterpoise to this evil proclivity, who has mastered the elements of philosophy knows that the attribute of unquestionable certainty oppertunes only to the state of a state of that conscience, so long as it exist; all other beliefs are mere
probabilities of a higher or lower order. Sound metaphysic is an amulet which renders its possessor proof alike against the power of superstition and the Counter Poison of Nihilism; by showing that the affirmations of the former and the denial of the latter alike deal with matters about which for lack of evidence, nothing can be either affirmed or denied.

In the above quotations the agnostic position is clearly and fearlessly stated. Mind and matter in themselves are absolutely unknwable, they are but names for imaginary substrates. It is beyond the reach of human faculties to know them. For any man to pretend to know them (inasmuch as no evidence is or can be forthcoming) is immoral. Because surely on this subject would we most perilously sound metaphysic in an amulet to guard its possessor against these dangers.

If such language as this fails to express accurately the agnostic position, certain Professor Keaneley is not to blame. In words that admit of no equivocation, Professor Keaneley tells his readers that mind and matter
are inscrutable, and that any attempt to discover their nature is beyond the limits of human reason, that is, is irrational.

This conclusion on this point is therefore absolute, because founded upon an invariable demonstration.

After refuting the a priori position with such formidable arguments, it is truly startling to find Professor Kennyel's advocacy venture on the irrational territory.

which he so unequivocally and so unhesitatingly plunges into the bounds of the Unknowable. Mind and matter turn out to be not unknown or unnecessary substrata, but elements of force. Accordingly, "the distinction between spirit and matter vanishes, inasmuch as matter according to a tenable hypothesis may be nothing but a multitude of centres of force". Thus we are led to "the spirit in matter".

But if mind and matter are absolutely unknowable, how is it possible for Professor Kennyel to state anything regarding their nature? Much more to identify them as centres of force? According to his own unfortunate statement, the settlement or even the slightest knowledge of these questions is an
by some

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absolute impossibility: they lie beyond the

bound of the human intellect, and therefore

upon irrational territory. Neither philosophy

nor any one else has the means of knowing

here. Professor Tuckey candidly admits

that his faculties do not afford him the

"means of knowing," and

attributing their intellectual incapacity

of knowledge to others people, he also

exclude

from them that they have "the means of knowing.

How then does he know it? To do so

without evidence would be immoral.

And so in this the whole incoherent

by reducing mind and matter to centres of

force he regards force as the "cause" of

phenomena. Accordingly, in stepping

beyond the region of phenomena, he

postulates force as a cause capable of

producing phenomena. It must therefor

be a thing though according to his own

assertion, it distinctly lies beyond the

phenomenal, or in the sphere limited

to human reason. Professor Tuckey

objects elsewhere to the "law of the corder

i.e., as if it denoted a thing - as if a

law of nature as science understands it

were a being endowed with certain

powers in virtue of which the phenomena

impressed by that law are brought about."
But by postulating force as the cause of phenomena, Professor Bentley regards force as a cause of phenomena, although in doing so he distinctly violates fundamental principles of epistemology. He premises "force" as a cause, although the attempt is simply an irrational one.

On this point Professor Bentley is quite clear. Speaking of vital force he says: "This may be scientific Ripo Van Winkle, about whom still hold by vital force; but among those biologists who have not been belied for the last quarter of a century, vital force no longer figures in the vocabulary of science."

This is an absolutely true statement concerning which Professor Bentley may be absolutely "correcture." For among those scientific Ripo Van Winkle figures an authority no less renowned than Professor Bentley himself.

In lecturing on the "Value of Natural History Sciences" Professor Bentley says, "Systematic teaching in Biology cannot be attempted with success until the student has attained a certain knowledge of physics and chemistry, for though the phenomena of life are dependent neither on physical nor on"
Chemical but on Vital forces yet they result in all parts of physical and chemical changes which can only be judged by their own laws.

So again "all vital action" may be said to be the result of the molecular forces of the protoplasm which displaces it.

Here again force is personified as a cause, although in doing so he steps beyond the bounds limited to the human intellect.

Referring to the antithesis that exists between mind and matter Professor Huxley says "The case is worse if we adopt the modern vague notion that Consciuensness is seated in the grey matter of the cerebrum generally: for, as the grey matter has extension, that which is lodged in it must also have extension." Indeed! If so, it is equally necessary for thought to have extension in order to think of space, for a thought is unextended it cannot think of an extended space!

But if Consciuensness must be extended in order to locate itself in the grey matter of the cerebrum, how is it possible for Professor Huxley to repudiate "force" as even the hypothetical Cause of sensations? Nor is our knowledge of anything we know or feel more or less...
than a knowledge of state of consciousness.
But if our knowledge is limited to mental or immaterial states and does the laws of causation entitle them to transcend these states, and regard force as a cause of sensations, to set up metaphysical entities rival to the physical, and afterwards knock them on the head when they prove refractory, surely becomes a scientist or critic of delusion.

For does the view which Professor Bruce holds regarding the relation that exists between the mental and material series reflect much better on the idea, "I really know nothing," he says, "and therefore hope to find anything of the steps by which the passage from molecular movement to state of consciousness is effected, and design to agree with the laws of the passage which is quoted from Professor Sidgwick the impassable nature of the gulf between the physical and mental state, he repeatedly insists. Again and again he maintains that there is no bridge to span the gulf, and this too in words that admit of no equivocation.

Yet in startling contradiction to all this, he says "in itself it is of little
moment whether we express the phenomena of spirit in terms of matter, or the phenomena of matter in terms of spirit, may be regarded as a form of thought, thought may be regarded as a property of matter - each statement has a certain relative truth.

It is simply superfluous for Professor Hunley to say that each of these statements has a "certain relative truth." If the self between the material series is not simply inscrutable, but unthinkably each statement is absolute nonsense. In the absence of evidence, and even of the intellectual possibility of evidence, Professor Hunley might have said "It is of little moment whether we express truth in terms of nonsense or nonsense in terms of truth." On his own showing it is immoral to believe a proposition that, while gratuitous, clearly and repeatedly as immoral is the doctrine that there are propositions which men ought to believe without logically satisfactory evidence.

If so, it is surely not demanding too much that theory unsupported by any evidence whatsoever should be promulgated as advanced truths of science. Professor Hunley, for example repeatedly states that all we know are
Such a union is not only inconsistent with, but necessitated by, sound logic. But, according to Hunley, all we need are states of consciousness. "If I were forced to choose between materialism and Idealism, I should select for the latter." But, if Idealism be true, how can Professor Hunley be necessitated by sound logic to accept the materialistic terminology? It must surely be a false logic which would prevent him from accepting the truth of Idealism.

Professor Hunley accepts the materialistic terminology at the same time that he rejects materialism. But, if he has no evidence to establish the truth of materialism, why in the absence of evidence, accept its terminology? Professor Hunley knows perfectly well that a clear and accurate terminology is, for the scientist, absolutely necessary to record his discoveries, and to avoid them from being inexact. Accordingly along with the materialistic terminology he must accept the legal consequences of materialism. In what purpose does Professor Hunley choose Idealism when he cannot dispense with the materialistic terminology? It is truly
starting to find Professor Stanley lay down so dangerous a precedent. For on the very same principle, a quack might choose a scientific nomenclature to describe his medicines, at the same time when he rejected the truths involved in the scientific terminology. To set up a metaphysical adage simply for the purpose of knocking out its horns with theological materialism is not a very edifying spectacle, even though cleverly done by an authority in science.

Not only, however, does Professor Stanley accept the materialistic terminology but actually attempts to cross the impossible gulf that separates the material and mental series. "We have as much right to believe that the sensation is an effect of the molecular change, as we have to believe that motion is an effect of impact." The following statement is still stronger, "I believe that we shall sooner or later arrive at a mechanical equivalent of consciousness, just as supernormal we have arrived at a mechanical equivalent of heat." This seems to include mental phenomena in the law of the conservation of energy, and render them subject to scientific method.
treatment. In startiff contradiction, he says: "The consciousness of brutes would appear to be related to the mechanism of their body simply as a collateral product of its working, and the a complete
without any power of modifying that
working as the Steele-vehicle which
accompanied the work of a locomotive
engine is without influence upon its
machinery. Their volition, if they have any,
is an illusion of physical change, not
a cause of such change;"

"It is quite true that to the best of my
judgment the argumentation which applies
to brutes holds equally for men, and
therefore that all state of consciousness
in us as in them are immediately caused
by molecular changes of the brain substance."

"The feeling we call volition is not the
cause of a voluntary act, but the result
of that state of the brain which is the
immediate cause of that act.

But, according to the law that regulates
the various transformations of energy,
each cause is capable of becoming
cause in turn. Mechanical energy
into heat, light, electricity. But according
to Professor Stanley, consciousness is
an effect of the molecular changes of the
brain substance but incapable of becoming a cause of physical change. This conflicts with the law of the conservation of energy and exempt states of consciousness from participating in the various transformations of entity.

The statement that states of consciousness do not modify the physical organism is, as far-reaching a truth, and seems to me to conflict with many of the best established truths.

(By the way, it might be allowed to ask a question. Granted that consciousness is located in the grey matter of the cerebrum, and is merely a superfluous appendage, would Professor Wundt consider it an advantage if man's brain were deprived of that external portion of grey matter which constitutes such superfluous attendants? Would it be a step in advance or a retrograde step, that is a case of retrogression?)

11. It conflicts with the principles involved in education. In what is called intellectual, moral and religious ideas, it is taken for granted that these ideas possess a determining influence upon life. If states of consciousness did not act, modify...
the physical organism then false or
superstitious ideas give rise to no harm.
On such grounds, moral and religious ideas
would turn out to be harmless appendages.

Again, in mental disease the state
of consciousness known as hallucination
or delirium may rise to such a state
of intensity as to obscure all other
ideas, and culminate in insanity.
Yet no specialist in mental disease
would consider that the hallucination
had no influence upon the physical
mechanism.

Finally, no one considers that state
of consciousness known as madness, or
without power to influence the physical
mechanism. Here I may be allowed
to interpolate a personal remark:
There are many years since I read of
Shelley's lectures, and it is only two or three
years ago that I happened to read his
lecture on "Animal Automatism."
at the time I was engaged as medical
witness in a case of Depauperate at
the Liverpool Assizes. On first
reading the above extract, I could
hardly believe that so eminent
a physiologist and biologist would
Commit himself to such a proposition.
hypothesis. As case after case passed before judge and jury in the Criminal Court, I thought to myself: Is it possible that states of Conscience do not modify the organism? Is it possible that Volition cannot be the "cause" of a Criminal action? Further more I thought over these questions the greater the importance they assumed, I finally concluded that the best way to resolve these questions would be to put Professor Wundt himself into the witness-box and armed too with the books of materialism. How Professor Wundt would answer, I do not know, but if consistent with the above quotation then it would logically follow that the wantful and deliberate planning of a crime had no bearing upon the case, because, as states of Conscience, they could not act upon the organism. To exempt, however, states of Conscience, and hand over the whole tragedy to the physical organism, would be to deprive the Criminal of responsibility and fling him into the category of the insane. Such a principle, if logically carried out, would not help much in deciding judge and jury in coming to a decision; it would
land them in hopeless and inextinguishable difficulties.

These arguments, Prof. Bently argued, have been much better disposed of and disposed of by a powerful thinker and distinguished physicist still living. This author says "fragile reed, as he may be man, as Pascal says, is a thinking reed; there lies within him a fund of energy, operating intelligently and so far akin to that which pervades the universe that it is competent to influence and modify the Cosmic process. In virtue of this intelligence, the dwarf lends to Titan his will. "Ethical nature may count upon having to reckon with a thinking and powerful enemy as long as the world lasts. But, on the other hand, there is no limit to the extent to which intelligence and will, guided by sound principles of investigation and organized in common effort, may modify the conditions persistent for a period longer than that now covered by history."

But according to Professor Bentley the Cosmic process is subject to necessity. "I take it to be demonstrable that it is utterly impossible to prove that anything
whatevets may or not be the effect of a material and necessary cause, and that human logic is equally incompetent and prone that any act is really spontaneous.

Professor Jones also maintains that states of consciousness are incapable of modifying the physical organism. This is intelligible if the cosmic process is subject to accidental necessity, as the above quotation clearly indicates.

But, according to the distinguished author above quoted, "in virtue of his intelligence the dwarf needs the law to be will": that is, states of consciousness must merely modify the physical organism but actually modify the cosmic process. Between these statements there is a flagrant and fatal contradiction. Ocurring in two different writers and a contradiction would clearly and immediately point to the fact that the subject was far from being thoroughly investigated. These quotations, however, do not occur in the works of different writers. The distinguished authority above quoted is none other than Professor Jones himself, and these quotations are taken from one of his latest lectures.

The Romanes Lecture, in which he
treats of the evolution of Ethics. Nor, is it less startling to discover, that the subjects treated by him with the greatest carelessness are those very subjects on which he robustly contradicts himself. Instead of serving as an ‘amulet’ against the poison of superstition and nihilism, where the Christian Astra of philosophic peace will commence her blessed flight, his ‘Coesamen’ leads him to reach the bottom of his apostleism with the crushing cudgel of materialism.

Moral Faculty.

The evolution of Ethics raises the question regarding the nature of Man’s Moral Faculty to which I now turn. In the foregoing discussion I attempted to think that the mental subject, mind, or soul was not constituted by the sum of Coexistent and inaccessible sensations. In addition there was a self-conscious ego to whom belonged the various sensations as states, and in addition having a special Constitution giving rise to certain modes of activity. In this way the self-conscious ego exerted
for itself a distinct and independent existence. In a self-conscious act of perception there is an activity exercised, in which the object of perception is discriminated from the subject of sensation. In this act there is a dynamical antithesis, in which the ego recognizes itself as cause distinct from the object as cause. This also involves the geometrical antithesis of cause here, a distinct from cause there, involving the idea of space. The ideas of causation, space, etc. are ideas inherent in the very structure of intelligence. They do not owe their origin to the susceptibilities of cause; they arise from the activity of the ego.

According to a sensational philosophy, however, these mind is constituted of a sum of sensations. Our idea of personalism, cause, space, etc. are like many other general ideas from generalizations from experience; they are the farthest removed from reality, and in passing backwards to our less generalized ideas, and to our more specialized experiences of things, we get nearer to the point of truth.

This is, however, to reverse our usual conception of things. In the admission
that reason is the instrument whereby man attains truth. It is taken for granted that reason is a common element of humanity, and that, in the attainment of rational truth, there is a standard, the prerogative of all rational beings. Now in maintaining that man has a moral nature no more is demanded than what is admitted when he is said to possess a rational nature. These ideas as a moral being he recognises, a right and wrong in actions; and these ideas are indissoluble with moral nature. The faculty by which he recognises their distinction is termed Conscience.

But how is Conscience recognised? "Conscience," says Professor Flint, "exists as a Consciousness of moral duty; as an assertion of a rule of moral duty; as a sense of responsibility. When it pronounces an action right, it does so because it recognises it to be Conformed to Law; when it recognises an action wrong, it does so because it recognises it to fall short of or to transgress law. It acts as judge of all we do, and as such it accurs or excuses, condones or approves, punishes or rewards us with a voice of authority which we may or may not disregard, but the legitimacy of such
we Cannot dispute."

But whence in this authority derived?

"Surely if the sense of authority mean anything," says Dr. Martineau, "it means the sense of something higher than we, having a claim on our self, therefore no more part of it; it overrules us and transcends our personal thought also, mingling with our consciousness and manifested through its intimations. If I rightly interpret this sentiment, I cannot therefore stop within my own limits but am irresistibly carried on to the recognition of another than I. How can that other remain without further existence, the predicate 'higher than' I 'takes me a step beyond' for what am I? A person 'higher than' another is, being ostensibly no more phenomena than can be, but only another person greater and higher and of deeper insight. In the absence of society or human companionship, we are thus still held in the presence of One having moral affinit with us, yet remote rights over us; by retiring into ourselves, we find that we are transported out of ourselves, and placed beneath the light of a diviner countenance. If it be true that once a free and living person

nothing short of a free and living person
Can have higher authority, than is it certain
that a subjective conscience is impossible.
The faculty is more than part and parcel
of myself; it is the common mien of life and
living. The subjectivity and abiding
with an apprehensive capacity in myself,
there we encounter an objective authority
without quitting our own centre of conscience,
an authority which at once sweeps out the
widest faculty without quitting our own
centre of conscience, arises a question
of our fellows men, for an excellence and
sanctity which the recognizes and report
has its seat in eternal reality, and is not
Centrist on our accidental apprehension;
it holds its quality wherever found, and
the revelation yet authority to me mind
is valid for all.

In thus claiming for Conscience
the possession of a right and duty in human
actions, no more is demanded than in
claiming for Reason the recognition of
truth and error. The existence of an objective
Righteousness, as distinctly relative to
Conscience as is that of an objective
Space for body, without a here we
Cannot Conceive a there, any more
than a higher without a lower.
Tracing our moral Conceptions back t
their source in the Divine mind, it peculiar for them a permanent reality. In attaining to Justice and Righteousness one attains to the primordial truth of things.

In the absence of an objective authority, then, all our moral idea lose all that characterizes them as general. Instead of leading man to the primordial truth of things in the nature of things, they are but the highest generalizations of man's experience, the last blossoming of human phenomena. They are furthest from truth and the reality of things. All that is subjectively noblest in man is but the last blossoming of the human phenomena. In the absence of an objective Righteousness, moral good becomes a mere satellite of sentient food; it sinks into Militarism: Constituted of mere sentient susceptibilities man can but spin round whatever subjective axis claims for itself a dominance over the rest.

Through their excess of empiricism such a theory wrecks itself. For as the lower animals possess a sentient constitution, why should not the same standard apply to them? How educate man on principles different from
toward all his highest moral and intellectual ideals are, in this theory, capable of being traced back to sensations and associated reactions, and which man shares with the lower animals. From such an origin it is impossible to attain the ideas of duty and of obligation. Separated from a Divine Source they are bereft of all authority, and all that constitutes the Crown and excellence of human nature.

An such a theory the deepest and profoundest tragedies of human life become inexplicable. When, after years of studied and deliberate trial, an awakened people up to testify of unstrained Righteousness, as in the 18th century and Richard III., it surely points to one of the most solemn facts of existence. Yet, if Conscience is, in reality, constituted of the sum of sensations these solemn tragedies are but as baseless and unsubstantial as a dream. Accordingly, whatever opinion may be one's belief in an objective Righteousness is the same proportion renders insecure that in most distinctive in the nature of morals.

This however is what Agnosticism does: on such a basis it is impossible to maintain an objective Righteousness.
Neuraxis position has been already referred to. According to his mind and matter are absolutely unknown. On this point therefore his 'incomparableness' is absolute.

But while our knowledge is exclusively phenomenal, Nature is subject to necessary laws. States of consciousness, the products of molecular changes in the brain, are never still; incapable of modifying the physical organism. Still, according to a (de)arable hypothesis the distinction between the two vanishes, as matter may 'nothing but a multitude of centres of force.'

In his latest utterances in *The Romanes Lecture*, these contradictions culminate. As faring are they that the statement, hence may, to be placed side by side, so that he who runs may read. It seems to him that in men as in brutes there is no proof that any state of consciousness is the cause of change in the motion of the matter of the organism: "The fulfillment of the voluntary act is not the cause of a voluntary act, but the effect of that state of the brain which is the immediate cause of that act.

In his *Romanes Lecture* he said "In the midst of his intelligence (man) the dwarf bends to the titan to his will."
"On the other hand, I see no limit to the extent which intelligence and will, guided by sound principles of investigation and organized in common effort, may modify the conditions of existence, for a period larger than that covered by history."

How to evolve a theory of ethics out of such conflicting elements might well cause one despair. But Professor Tylor makes the bold attempt. In his Roman lecture he says "As I have already urged the practice of that which is ethically best -- what we call goodness or virtue -- involves a course of conduct which in all respects, i.e., opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion, it demands self-restraint in place of thrusting aside or trampling down all competitors, it requires that the individual shall not merely prey but shall help his fellow; its influence is directed, not as much to the survival of the fittest, as to the fullest as many as possible to survive. It repudiates the feudalistic theory of existence."

On next page Professor Tylor sums up "Let us understand once for all that the ethical progress of society
depends, not onimitating the cosmic process
still less in running away from it,
but in Complicating it. It may seem
an audacious proposal that to pit
the Microcosm against the Macrocosm,
and to set man to subdue nature to his
higher ends; but I venture to think that
the great intelectual difference between
ancient times, with which we have
been occupied and our day, lies in
the solid foundation we have acquired
for the hope that such an enterprise
may meet with a certain measure
of success.

Professor Huxley may well say
that it seems an audacious proposal
to pit the microcosm against the
macrocosm,” as he himself maintains
that “of all the dangerous mental beliefs
that which schoolboys call agnosticism
is probably the most perilous. To pit
the microcosm against the macrocosm
is to pit the subjective elements of
knowledge against the objective. But
agnosticism maintains that “it is
wrong for a man to say that he is
certain of the objective truth of any
proposition unless he can produce
evidence which equally justifies that
Certainly. This is what agnosticism amounts to; and in my opinion, it is all that is essential to agnosticism. That which agnostics deny and repudiate as invalid is the contrary doctrine that there are propositions which men ought to believe without logically satisfactory evidence, and that they ought to attach to the projection of disbelief in such inadequately supported propositions.

If this accords with Professor Flew's view, that "all that is essential to agnosticism is all that is essential to reject agnosticism," for as will and states of consciousness are incapable of being "modified or combating" the cosmic process. Having thus separated the microcosm from the macrocosm by an impenetrable gulf, how can we, in the absence of logical evidence, pit our against each other.

No does this comprise all the difficulty. All that is our peculiar morals is dependent upon an objective righteousness. In the absence of this objective element, morality disintegrate into hedonism. How they come out of
these purely subjective elements obtain a theory of duty. To objectify a theory of duty out of these purely subjective elements is sheer anthropomorphism. Yet to Professor Undless there is no other alternative. The moral sentiments he tells us have been instilled in us in the same way as other natural phenomena by a process of deduction. "As the immoral sentiments have no less been instilled, they are as much natural reaction for the other. The thief and murderer follow nature just as much as the philanthropist."

This brings us to the crux of the difficult. How separate the moral from the immoral? These sentiments are subjective to each individual and, regarding to anthropomorphism, it is unwise for a man to say that he is certain of the objective truth of any proposition unless he can produce evidence which logically justifies that certainty.

Does Professor Undless try these separations? If so, it can only be by a standard obtained from purely subjective elements, to objectify which would be a piece of sheer unreasoned anthropomorphism. If not, then he has no
right to "put the microcosm against the macrocosm" and "set man to estimate nature to his higher ends." It is these traits that have led to the conclusion that Darwin's "cynicism" against the "consequences of the sphere of things" leads him not merely to irrefutably demonstrated absurdities, but also to knock the bottom out of his "fetters with the Constantinian cudgel of epistemism."

From these Considerations it is seen that Physiology has a very intimate bearing upon the nature and limits of knowledge, as well as upon human responsibility. When allied with materialism it becomes simply destructive of all knowledge and responsibility. It does not account for the unity of the Conscience subject. It cannot rationally account for memory. That is, it cannot connect the present with the past, and loses all connection with time. It obliterate its distinction.
between the causes and grounds of belief:
and, in reducing all our beliefs to effects,
when truth and right into the same category
as error, dreams and hallucinations.
If such readers believe and experience
impossible, inasmuch as all that happen
is but the necessary outcome of the
necessary physical and chemical laws of
nature. These principles are simply
destructive of all knowledge and responsibility.

All these difficulties arise from
the attempt to construct the Kosmos out
of indepedent atoms with independent
forces. The only way out of the difficulties
is to deny their independence. As
participating in a system, the atoms
are dependent. and each atom is determined
by something objective. Hence, if
objections they cannot determine their
own state. The atom and forces, add
the pure phenomenal activity of the
bodily power of the Universe. Only
a causal intelligence is capable of
originating phenomena. "I am" is
inseparably associated with "I am",
by an intellectual necessity. the phenomena
of the Universe are related to the Causal
Intelligence capable of originating these
phenomena. we have also seen that
our moral nature postulates an objective righteousness. Our own nature therefore directly postulates a rational and moral Being capable of originating and sustaining the Universe. Theism therefore in the indispensable postulate of all knowledge and of all truth.

In Theism, moreover, is the found an answer to the question put to the materialist, the non-rationalist and the agnostic—how from subjective elements attains to a knowledge of the objective? All knowledge arises from an interaction between the self and not-self. Hearing, vision, and all subjective sensations of objective mode of motion. But if the mind function in the physical organism were maintained then the same sensations might take place even in the absence of an external world. In such a case all knowledge might be a subjective as dreams; and, if Descartes' hypothesis evil were let loose, who could tell that mankind is not all subjective or all delusion? To such a question the only answer is trust in a moral Being. Theism therefore is an indispensable postulate for our belief in an external world and in the belief of being similar
to ourselves.

In this view that regards the atom and force as phenomenal, it will be objected that it seems to refute itself by its own absurdity. What it will be asked, looks more absurd than to say that matter with its various forces—the storm at sea, the hurricane on land—are simply phenomenal?

To this question the following quotation from Hermann Lotze supplies an answer. "Partly the influence of daily life, partly the peculiar interest of science, the expressed object of future research, in accurate acquaintance with things have accustomed us to estimate the worth of our ideas and sensations by the accuracy with which they represent the nature of objects. We forget that the occurrence of these internal phenomena within us is quite as much a presupposed fact as the existence of the source whence they spring; and after we have become used to apply to these the cognition, and thereby tinct to put these into necessary relation to something external, we are apt to extend belief and knowing, as if the former comprised the whole reality of the universe and the latter had only to be a food or hand
Cognitive reflection of the Complete Universe.

But the fact that its influence of the existent and its changes causes within
natural beings a world of sensation becomes
into belief, is no insignificant addition to
the connection of things, as if the impact of
all existence and action would be complete
without it; on the contrary it is itself one
of the greatest, if not the greatest of all
events, whose depth and meaning make
all else sink into insignificance. That
could take place among the constituents
of the Universe. As we prize a blossom
for its brilliance of colour and its fragrance
without requiring yet to exhibit a
representation of the form of its roots, so
we must prize that inner world of
sensation for its own beauty and significance
without measuring its value by its fidelity
with which it reproduces its less
important foundation.

For why in fact should we not pursue
this whole relation to which a crude mode
of conception has accustomed us? Instead
of setting up the external as the goal
to which all the efforts of our deduction
are to be directed, why should we not
rather look upon the splendour of light
and sound as the end which all these
dispositions of the external world, whose
oblivion we deplore, are designed to realzie?
What pleases us in this drama that we
see developed before us on the stage is
the poetical idea and its inherent beauty.
No one would expect to enhance this enjoyment
or discern a profounder truth if he could
indulge in an examination of the machinery
that effects the change of delivery and
illumination; no one while tending in the
meaning of the spoken word by desire
a distinct knowledge of the physical
processes by which the organism of
the actor produces the resonance vibration
of their voices, or monitors the motion of their
expressive gestures. The course of the
universe is such a drama: its essential
truth is in the meaning we put forth as an
intelligible to the spirit, and the other
which we would often so faintly
and in which decided by prejudice we find
of all else the true being of things is
nothing else than the framework on
which rests the actual momentous
actuality of the fair appearance. Instead
of complaining that in sensation the
real properties of things outside us
are not represented, we should rejoice
that something so much great and
faine come in its place; we would not fear but lose if we had to sacrifice the radiant color, reflection and light, the power and softness of tone, the fragrance of odors, in order to be enriched with peculiar in exchange for the variegated world of true reality the most accurate acquaintance with vibrations moving with more or less velocity in this or that direction. Decide it is within our power to attain to this knowledge by scientific research, and actually to reach these colorless foundations of the visible world on which actual sensation spreads thin delusion, so as we would be more correct to say, transfiguring radiance let us therefore cease to lament as if the reality of things escaped our apprehension; on the contrary it consists in that asubit they appear to us, and all that they are before they are made manifest to us in the meditative preparation for their final realization within our being. The beauty, odor, and the warmth, and fragrance are what nature in itself strives to produce and express but what it Cannot do by itself; for this it needs as its last and noblest instrument the sentient mind that alone can put into word its mute стремлений and in the story of sentient intuition act forth in harmonie
actually what all the motions and features of the external world were really undergoing to express."

According to Sir W. Hamilton, in every act of perception there is an immediate knowledge of mind and matter. Accordingly, he termed it "a theory of natural dualism or natural Realism." The theory of Representative perception he subjected to the most searching criticism. "Saying aside, at present, the fact that it is impossible to reconcile his theory of Real presentationism with his views regarding the phenomenal nature of all knowledge, it also ignores the important discoveries, in recent times, made by physics and physiology. According to these sciences, it is distinctly proved that the secondary qualities of bodies are subjective. Objectively they are represented by modes of motion. Again, the atoms which form the various molecules are not in contact. They are kept apart by forces in miniature. The solidity of the mass is therefore due not to the sum of the solidities of the atoms but to a dynamism which binds the various elements together. Moreover, the atoms, as we have seen,
are not ontological entities but phenomena of the activities of the basic power of the universe. Accordingly, Professor Stanley was quite justified in maintaining that, "Even the Wits Hamilton learned horizons and acute critics as he was not only failed to apprehend the philosophical and physical hearing of long-established truths, but when he affirmed that there is no reason to deny that the mind feels at the finer points, and more to assert that the hand in the state of man of thought, he claimed that he had not apprehended the significance of the revolution commenced two hundred and fifty years before his time. De Cartes, and effectively followed up by Haller, Banti, and Bonnet in the middle of the last century."

Here, however, arises the question: Is the external world a purely subjective product, having no objective significance? Is Berkeleyanism true? To this question Professor Boscare offers the following masterly reply: "This difficulty arises from separating God as Ruler from God as Deity, the basic fact of the Universe in a self-conscious agent. As agent, he maintains a series,
of activity: and a Knower he is a three
activities; the form of the world. As agent
he is not independent of himself as knower, and as knower, he is not
independent of himself as agent. He
must be the indissoluble synthesis of
knowing and doing. As reason, he is real
only through the act; and as actor he is
real only through the reason. + + Here
again, we come upon the old antithesis
of matter and form. These are absolutely
inseparable. Will gives the matter
and thought gives the form. + + The
world then is no individual fiction
but is a proper universal. It exists
not in finite thought alone, but in
the infinite thought and infinite
relation. This constitutes its reality and
universality, and distinguishes objective
ideализм from the subjective idealism
of the empiricists."

But, if the physiological materialist
will still insist upon putting forth his
materialism as an ultimate theory of
the Universe, and claim for it the
Cauter of Science, then he must
Count the Cost. Hon. In the absence
of a Universal mind, man is the first
person that has existed, and the highest.
Apart from a Divine Being, his highest moral and spiritual ideals, have no objective validity or significance. They are but anthropomorphic ideals, whose significance derives in himself, and indicative of no truth or reality beyond. In such a theory all the highest and greatest ideals that have stirred men's hopes and aspirations in every country and in every age are but as unsubstantial as the baseless fabric of a dream. All the poetic ideals that have inspired a Chaucer, Spenser, Shakespeare, Milton, and many another genius from literature, as Cowper, Wordsworth, Tennyson, are but as fragile and frail as the rosy hue of early morning. Along with these must also go the noble army of martyrs who in every age and time have prepared for the Cause of truth and righteousness. Are all these resigning, thus remaining a crucial question for the Materialist who, out of the ranks of materialists, are capable of filling the vacant thrones?

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