

THE PRESBYTERIAN AND REFORMED REVIEW

No. 51—July, 1902.

I.

THE EPISTEMOLOGICAL ARGUMENT FOR THEISM.

IT is not difficult to understand the influence exerted by the Kantian philosophy during the last few decades. To an individual or a generation, engrossed in the study of science and indisposed to metaphysical speculation, averse to materialism and skepticism and moving in the direction of faith, the standpoint of Kant offers much attraction. It combines two signal advantages. It authenticates the concepts employed in science; it provides an independent basis for religion. In both these respects its superiority as a working philosophic theory to positivism is obvious. The late Professor Huxley enthusiastically extolled Hume as of all philosophers the most satisfactory to a scientific mind. But Hume deprives science of its metaphysical foundations; he denies philosophical validity to the idea of causation, and resolves the universe into unrelated atoms. It seems infelicitous that a speculation which invalidates the notions indispensable to scientific reasoning should be regarded with approval by men devoted to the interpretation of nature. The Kantian doctrine is preferable in that it expressly vindicates the concepts which underlie our mathematical and our inductive science.

The other advantage mentioned is of even greater consequence. "Our most holy religion," says Hume, in the *Essay on Miracles*, "is founded on faith, not on reason." Kant uses similar language: "I must abolish knowledge, to make room for belief." His meaning, however, is entirely different. To Hume, religion is a superstition, a product of custom and imagination; to Kant,

IV.

FREE-WILL AND PHYSIOLOGICAL PSYCHOLOGY.

THERE are two famous labyrinths, says Leibnitz, in which the human reason has wandered: one relating to necessity and freedom, and the other to the constitution of matter. Into both of these our subject invites us to venture.

At the time of the Fall, according to Milton, the spirits of the lower world relieved the tedium of their existence by reasoning together of "fixed fate, free-will, foreknowledge absolute," and judging from recent literature interest in the discussion has continued down to the present day. We are frequently told, indeed, that the problem is insoluble, or of no practical importance, or purely scholastic, or due to the whimsical notions of a few metaphysicians, or that it has been settled or dropped by modern philosophy. But it continues to be discussed.

The chief reason, doubtless, for present interest in the question is its supposed ethical bearing—the fear among advocates of free-will that a general acceptance of the determinist creed would be disastrous to morality. The philosopher, happily, knows better than to allow his philosophical belief unduly to influence his conduct; but if the doctrine of the extreme determinist be generally accepted, the results no doubt would be unfavorable to morality. If it should come to be commonly believed that the will is an impotent factor in the game of life, that all of a man's actions are determined not *by* him but *for* him, either by heredity or physical environment, the logical, and no doubt to a great extent the actual, result would be a weakening of moral restraints and a paralysis of moral effort. Mr. A. J. Balfour has reason for his fear that if the creed of "naturalistic determinism be adopted certain emotions hitherto found serviceable in the promotion of virtue, such as repentance, moral indignation, and moral admiration evoked by the heroic or the saintly, will at a stroke be reduced, if they are to survive at all, to the position of amiable but unintelligent weaknesses."* Dr. Martineau, again, enters a protest against the view of Prof. Sidgwick that the

* *Foundations of Belief*, p. 25.

free-will problem is not of any vital importance for ethics. The fascination of the problem, he confesses, arises to him from "its profound connection with the very roots of our moral and spiritual convictions.* And having established the authority of conscience and the reasonableness of theistic belief, he feels constrained to vindicate free-will lest the whole structure of morals and religion which he has reared should topple in ruins. The literary critic no less than the ethical philosopher has a quarrel with the determinist. If man, as a recent critic of Zola has expressed it, "is fatally the product of a certain hereditary temperament, which unfolds itself in a certain physical, intellectual and moral environment," he is not as interesting a subject for literary treatment as he is if considered as a free being who forms his own character. Says Mr. Paul Elmer More : †

"The ordinary fault of naturalism is the lack of interest, so that we see the genuine naturalist constantly seeking to attract readers by all sorts of illegitimate allurements of the animal senses. Juan Valero curtly asks: 'How can such novels interest when they present a temperament and not a character—a mere machine which moves in accordance to physiological laws?'"

The sombre pessimism which pervades much of our modern literature is but the dark shadow cast by a fatalistic philosophy. The trinity of spiritual beliefs, God, Freedom and Immortality, generally stand or fall together; and where these are lost, hope and aspiration will die, life will be looked upon as controlled by blind fate, and the only solace for the miseries of existence will be that life "ends soon and nevermore shall be."

The determinist creed has found a powerful ally in the science which investigates the connection between mind and brain. That this connection is an intimate one cannot now be denied by the strictest spiritualists in philosophy. Idealists, who hold that body is in some sense a mental construction, do not doubt that the fortunes of mind and of the body as so constructed are closely bound up together. That the part of the body most closely connected with the thinking or reasoning functions is the cranial cavity in the upper part of the head seems to us so self-evident as to require no scientific proof; but the fact was not always recognized. Aris'otle, strangely enough, believed that the abdomen was the seat of the intellect. The researches of modern physiology and psychology have proved beyond a doubt that the mental life is in some way associated with the tissues of the brain especially with the gray matter which composes its rind or cortex. The tendency of modern investigation of the connection, between

* *Study of Religion*, Vol. II, p. 185.

† "The Novels of George Meredith," *Atlantic Monthly*, October, 1899, p. 492.

mind and brain is doubtless toward a materialistic and mechanical explanation of the facts of mind. Genetic psychology, proceeding upon the theory that all higher and more complex phenomena of mind are the products of lower and simpler forms of mental life, seeks to establish an unbroken connection between the developed mind of the man and the rudimentary mind of the animal. The evolutionist goes a step further and finds the germ of consciousness in the vegetable cell or even in the properties of the inorganic atom. Physiological psychology again—a science still in its infancy, but a very lusty infant—favors the construction of mental facts under mechanical categories. The intimate connection between mind and brain has been a truism of science since the time of Descartes, but has received new emphasis in recent years through the researches of Maudsley, Carpenter, Weber, Fechner, Wundt and others. It has been shown that many of the simpler mental processes are connected with definite portions of the brain cortex; that diseased brain tissue causes an impairment of the mental powers; and Fechner, the father of “psychophysics,” or metric physiological psychology, has attempted to bridge the gap between mind and matter by showing that the relation between the physical stimulus and the resulting sensation can be expressed in a mathematical formula.

The currents of modern psychology have thus been setting strongly in the direction of materialism. In its origin mind is the product of material particles organized in the form of brain cells, while its processes are the result of molecular movement in the brain. In its origin and history, and it would seem in its destiny, the conscious life is inextricably bound up with matter and its laws. If soul is a phase or product of a complicated arrangement of highly evolved matter, the belief in its substantiality, its freedom, or its continued existence would seem to be absurd, if not impossible. The eclipse of spiritual beliefs with which philosophy is thus threatened was well described over thirty years ago by one who has been popularly regarded as a champion of materialism. Said Prof. Huxley:

“The consciousness of this great truth (that the physiology of the future would extend the realm of matter and law over the mental sphere) weighs like a nightmare, I believe, upon many of the best minds of these days. They watch what they conceive to be the progress of materialism, in such fear and powerless anger as a savage feels when during an eclipse, the great shadow creeps over the face of the sun. The advancing tide of matter threatens to drown their souls; the tightening grasp of law impedes their freedom; they are alarmed lest man’s moral nature be debased by the increase of his wisdom.”*

The doctrine of materialism which has thus been reinforced by

* “The Physical Basis of Life,” *Fortnightly Review*, Feb., 1869.

modern science is a theory of the universe which has had its representatives in all periods of philosophic thought. In its thoroughgoing form it is a ruthless application of "Occam's razor" in the interests of philosophic unity, cutting away the excrescences of supposed spiritual existence. Matter, motion, force are everything. Mind is but a phase, phenomenon or manifestation of highly organized matter. Following the lead of physical science we seem to gain the whole world of knowledge but to lose the soul; for the notion of a soul or spirit as anything distinct from or independent of a special arrangement of matter is a superstition, the relic of an outworn creed—"The world is made of ether and atoms and there is no room for ghosts." It is an interesting fact that the earlier materialists, Democritus and Epicurus, left room in their theory for certain kind of freedom. The primitive atoms, which by hypothesis moved only in straight and parallel lines, were endowed with a species of freedom to account for their declination or swerving when combining to form individual things. Again, if pleasure is man's highest good, as Epicurus held, man must be free to choose that course of action which promises the greatest pleasure. Modern materialism, whether in its crude or more refined form, is distinctly inimical to free-will. If man is a machine, as La Matrie, pushing Descartes' automaton theory of animals to an unexpected conclusion, declared, or if "the brain secretes thought (including volition) as the liver secretes bile," according to the famous dictum of Cabanis, freedom in any form is of course a chimera.

A theory of the universe which would reduce mind to a form of matter or a mode of motion has of course its philosophical as well as its ethical or sentimental objections. The more complete becomes the mechanical explanation of the world in terms of matter and motion, the more insistent becomes the teleological demand, How explain the mechanism? The questions, Whence? For what purpose? will continue to be asked and materialism can offer no reply. Again, the materialist in the very assertion of his creed seems to become involved in a logical paradox. When he declares, "I know that matter alone exists," he is in the familiar dilemma of the man of the logical text-books who says, "I am now uttering a falsehood," or "I am keeping silence." His statement must be false in order to be true. The affirmation of the existence of anything—say, matter or molecules—is an activity of mind. The more positive, therefore, the materialist is in the assertion of his creed, the more deeply is he involved in contradiction. He would seem to be doubly inconsistent when he not only confesses his faith, but seeks to affect the brains of other people

so that their brain-processes shall turn out the creed of materialism. Those who remain obdurate will reply that since knowledge under the view in question must be simply the product of the fortuitous concourse of thoughtless atoms, an arrangement of brain molecules corresponding to the spiritualistic creed is as "valid" as an arrangement corresponding to the materialistic creed, if, indeed, any question of validity can be raised between them.

The logical difficulties in holding the materialistic or "man-machine" doctrine have been illustrated by a recent writer, to whom Dr. Van Dyke has called attention in his admirable chapter on "Liberty."* Says Mr. Henry Beauchamp :

"I am an automaton—a puppet dangling on my distinctive wire, which Fate holds with an unrelaxing grip. I am not different, nor do I feel differently, from my fellow-men, but my eyes refuse to blink away the truth, which is, that I am an automatic machine, a piece of clockwork wound up to go for an allotted time, smoothly or otherwise, as the efficiency of the machine may determine. Free-will is a myth invented by man to satisfy his emotions, not his reason. I feel as if I were free, as if I were responsible for my thoughts and actions, just as a person under the influence of hypnotism believes he is free to do as he pleases. But he is not ; nor am I. If it were once possible for a rational being to question this fact, the discoveries of Darwin must have set his doubts at rest.

"And yet it is impossible to avoid the conclusion that we are nothing else than irresponsible automata, whose actions and thought are pre-determined to the minutest detail.

"What is crime? A crime is an action threatened by the law with punishment, says Kant ; and freedom of action or free-will is a legally necessary condition of crime. But the law of heredity conclusively demonstrates that free-will and freedom of action stand in the category of lively imaginings. Therefore crime, as the law understands it, is non-existent, since no imputability can be recognized when a man is not responsible for his actions. Therefore the law is not justified in inflicting punishment."†

Plainly our "automaton" is right in saying that the theory is destruction of freedom and moral responsibility. But why does he declare with some show of indignation that punishment is unjustifiable? If all actions are strictly mechanical, the acts of the collective automaton can as little be criticised as unjustifiable as those of the individual. Moral categories, such as right and wrong, justifiable and unjustifiable, must be everywhere abolished. Why, again, does the distinctive wire by which our automaton is controlled compel him to act in so strangely unautomatic a manner? Instead of being content to "dangle," as we should expect him to do, he looks abroad upon his fellow-puppets with pity not unmixed with indignation and cries aloud in the pages of the *Fortnightly Review* : "Ho, ye brother-automata ! Don't you know

* *Gospel for an Age of Doubt*, pp. 210-212.

† "Thoughts of a Human Automaton," *Fortnightly Review*, March, 1892.

that you are making fools of yourselves? Reform your automatic thoughts and dangle the way I do." Readers of Mr. Beauchamp's essay may find a grim comfort in reflecting, with Mr. Balfour, that a belief in freedom, from the evolutionistic standpoint, has been one of the conditions of success in the struggle for existence, and that consistent determinists will in the long run be eliminated by a process of selective slaughter, and leave the field to the better-equipped advocates of freedom.

Latter-day philosophers with a materialistic bias generally hide the grosser features of materialism under the modest vail of agnosticism. Prof. Huxley, for example, seeks to escape from the consequences of a materialism which, as he says, "may paralyze the energies and destroy the beauty of a life," by taking refuge in the skeptical philosophy of Hume. He slays doubt with doubt. If we know matter as it really is, and further can perceive in cause and effect not simply a sequence but a necessary sequence, he sees no escape from utter materialism and necessitarianism. But, he asks, "after all, what do we know of this terrible 'matter,' except as a name for the unknown and hypothetical cause of states of our own consciousness?*" We know nothing really of the true nature either of matter or spirit, nor of any necessary connection of one thing with another. So it follows that "the materialistic position that there is nothing in the world but matter, force and necessity, is as utterly devoid of justification as the most baseless of theological dogmas." Between the bald materialism, which says that mind is sublimated matter, and the refined materialism, which says that from all we know of mind and matter the former is the product of the latter, but adds in an aside, we know nothing of either, there seems very little to choose. In the one case, mind is the result of the play of material atoms; in the other, it is merely a combination of atoms of sensation, a string of beads without the string. In neither case can we assert the existence of the freedom or reality of spirit, and in both cases the laws of what we call the mental life must be the laws of mechanical causation.

But is there no escape from the materialistic frying-pan except into the agnostic fire? The new psychology itself supplies at least a partial answer. The modern psychologist, studying psychology as a "natural science," starts out, we may roughly say, with two fundamental postulates. The first is taken from physiology, and is "Thought is a function of the brain." Every mental process has as its cause or accompaniment some corresponding change in the central nervous system. In a word, "the

* "The Physical Basis of Life," *Fortnightly Review*, February, 1869, p. 143.

materials of the consciousness are the products of cerebral activity" (Huxley). The second postulate is taken from physics, and is the doctrine of the conservation of energy, or rather an inference from it. There is no loss of energy out of the material world, and no influx of energy from without. The sum of energy in the physical world is always constant.

The first postulate may be criticised on its own account. The function of an organ in the physiological sense is its activity, what it does, and results in some physical movement or some chemical change. It is the function of the hand to grasp, of the liver to secrete bile, of the heart to maintain the circulation of the blood. In the strict physiological sense, then, the function of the cells and fibres of the brain is not to think but to receive, transform and transmit incoming nerve currents. But waiving this verbal objection, let us examine the relation between mind-process and brain-movement implied in the formula, "Thought is a function of the brain." The plain meaning is that brain-process always precedes and produces thought-process; in short, that "the materials of consciousness are the products of cerebral activity." Those who hold that mind is in any sense a product or property of matter must hold this view, and it has the advantage of agreeing in part with the view of the ordinary consciousness. The ordinary man believes that the igniting of a match is the cause of his sensation of light, or if he has a smattering of physiology and psychology he traces the process through vibration in the ether, chemical change in the rods and cones of the retina, irritation of the optic nerve and excitement of the cortical centre—all of which is followed by the sensation of light. But the ordinary man believes also in a reciprocal action of mind upon body—that the wish, for instance, to raise his hand is not only father to the thought, but is the real cause of those movements in the brain centre, nerves and muscles which result in the action. If, however, mind is subordinate to matter, this reciprocal influence plainly must be denied. The purpose of the statesman, the benevolence of the philanthropist, the hatred of the murderer, the idea of the artist cannot have the slightest influence upon the expression of these mental phenomena in the material world; otherwise there would be an influx of energy from without into the material, and the servant would become master.

We are brought thus to what we have called the second postulate of physiological psychology,—the conservation of physical energy; and we find that it is the rock upon which the first postulate, the brain-function theory, is wrecked. Let us listen to Prof. Höfding:

"The supposition that a causal relation may exist between the mental and the material is contrary to the doctrine of the 'persistence of energy'; for at the point where the material nerve-processes should be converted into mental activity, a sum of physical energy would disappear without the loss being made good by a corresponding sum of physical energy.

"Of course there is always one way of escape: to deny the doctrine of energy. This doctrine is not experimentally proved, and, as we have seen, cannot, strictly speaking, ever be proved. But according to the general rules of methodology, we may not, in framing our hypotheses and in judging of them when framed, enter into conflict with leading scientific principles. And in modern natural science, the doctrine of energy is such a leading principle. If, therefore, an hypothesis is in conflict with this doctrine, the fact tells at once against it."*

After examining the theories of dualism, materialistic and monistic spiritualism, Höffding states, though only as a "provisional hypothesis," his own view:

"Only the fourth possibility, then, seems to be left. If it is contrary to the doctrine of the persistence of physical energy to suppose a transition from the one province to the other, and if, nevertheless, the two provinces exist in our experience as distinct, then the two sets of phenomena must be unfolded simultaneously, each according to its laws; so that for every phenomenon in the world of consciousness there is a corresponding phenomenon in the world of matter, and conversely (so far as there is reason to suppose that conscious life is correlated with material phenomena).

"Both the *parallelism* and the *proportionality* between the activity of consciousness and cerebral activity point to an *identity* at bottom. . . . We have no right to take mind and body for two beings or substances in reciprocal relation. We are, on the contrary, impelled to conceive *the material interaction* between the elements composing the brain and nervous system *as an outer form of the inner ideal unity of consciousness*. . . . It is as though the same thing were said in two languages."†

This "new Spinozism," as it has been called, is held in different forms, sometimes as the metaphysical "double-aspect" theory of one substance with two parallel but unconnected attributes, but more often as the more modest empirical theory of "psycho-physical parallelism," and may be said to be the dominant theory among psychologists to-day. At first sight it seems rather favorable to free-will. If the mental series goes along by itself, not influenced or controlled by the physical series, but governed by its own laws, mind may conceivably be endowed with the power of initiating action. When we examine more closely, however, we see that the freedom possible under the theory is a vanishing quantity. In the first place, mind can have no influence over bodily action; all the deeds done in the body are determined by physical antecedents, governed strictly by physical law. And secondly, even in the closed circle of the thought-life there seems to be no room for freedom. Every psychical process

* *Outlines of Psychology*, pp. 55 and 58.

† *Op. cit.*, p. 65.

has some physical process as its concomitant, and the cause or antecedent of this physical process is to be found in the physical world. The inference seems inevitable that mind must look always to the material world for the clue to its own activities, and that the conscious life, while theoretically independent of matter, is nothing but a passive spectator of its own processes, borne along upon the stream of physical causation and unable to influence its own course.

The double-aspect theory may meet the demands of the doctrine of the persistence of energy, but there are other claimants to be satisfied before it can be accepted as the last word upon the psycho-physical problem.

1. There is the seeming paradox that concomitant phenomena which are wholly shut off from each other's influence, are yet but the two aspects of a fundamental unity. First there is a great gulf fixed between the mental and the material, and then, as if to atone for this arbitrary divorce of what in nature seems joined together, it is hinted that after all states of consciousness and the modification of brain-cells are two sides of the same thing. Leaving out of account the doctrine of the persistence of energy, with which, it would seem, the physiological psychologist as such has nothing to do, the facts of his science apparently confirm the common belief in (1) the interaction, and (2) the real distinction, between mind-processes and brain-processes. Both of these the theory in question denies.

2. The relation between the two sets of facts, the mental and the molecular, which go along in a parallel series, is not like the relation between the movements of the central-observatory clock and of another clock synchronized with it by electrical connection, but like that between two clocks so constructed in the beginning as always to keep time together. It is Leibnitz's "preëstablished harmony" over again. Only in the present theory nothing is said about any preëstablishment.

3. There is no evidence that the physical series and the psychological series are always concomitant or parallel. This objection to the double-aspect theory is strongly urged by Prof. Ziehen.* To Wundt's theory that there is a conscious concomitant to all movements of organized matter, Ziehen objects that there is no evidence for this except in the case of the brain, and that even in the narrow sphere of molecular brain movement "numberless material processes of the cortex take place *without* the concomitance of psychical processes."† On the other hand, to the ques-

* *Introduction to Physiological Psychology*. See the last chapter.

† Page 275.

tion whether "material processes in the central nervous system accompany *all* psychical phenomena," his answer is "decidedly negative."* He finds psychical factors for which there is "no material basis," and instances "the projection of our sensations into space and time, a psychical fact for which we were unable to obtain any psycho-physical explanation."† The view which Ziehen himself adopts is called "critical monism," and is really the Kantian doctrine. The psychical series is shown to be the primary series, and the psycho-physical dualism to be only a semblance.

4. If there is no interaction between consciousness and the physical world, gaps are left both in the physical and in the mental series which are wholly unaccounted for. Take first the mental series. I am writing, let us suppose, at my desk, with my thoughts engrossed with the subject of this paper. Suddenly the firebell rings, and my thoughts are at once far away from my subject and occupied with curiosity or anxiety as to the locality of the fire, and a desire to join the crowd running to the scene of the excitement. What is the link in the transition from abstract speculation to eager curiosity or anxiety? Surely none can be found unless we go for it into the physical sphere—the fire, the bell, the vibrations in the atmosphere, the excitement of the appropriate cortical centre. But all these, according to our theory, have absolutely no effect upon consciousness. The psychical series finds in itself the laws of its own changes. Plainly there is here a gap or break in the conscious life which nothing but the effect of a physical event will account for, and the whole life of thought, emotion, sensation and volition will be filled with similar instances of wholly unexplained and inexplicable discontinuity.

The facts of bodily movement are equally inexplicable without the intervention of a psychical agent. Let us borrow an illustration from Dr. Martineau :

"A lady who is a social favorite is in lively conversation at a dinner-party five or six miles from her London home. A servant hands to her a telegram: 'The child has fallen downstairs; he is seriously hurt.' A convulsion of horror passes over a face just bright with laughter, agitates her pulse, takes away her breath: but, with the self-control of benevolent tact, she contrives to withdraw with just adequate explanation; orders her carriage and flies to her boy; but on the way goes round to her physician's door to take him with her; and even remembers that there may be need of a surgeon too, and bears the delay till she can return provided with both forms of skill. Reaching home at last and going straight to the child's room, she covers the flutter of fear and pity with a bright look and comforting words, till the way is prepared for the friendly doctors; and when it proves to be a broken arm, she insists on heing their attendant whilst it is set, that

* *Introduction to Physiological Psychology*, page 2.

† Page 277.

she may strengthen his heart and quiet his cries, though herself feeling as if she were being torn limb from limb.”*

If we believe that there is no interaction between mind and brain, we must believe that, provided only the nerve and brain mechanisms had been the same, the mother would have gone through all the bodily movements necessary to bring help to her child had there been no conscious meaning assigned to the words of the telegram, no affection, no solicitude, no eager desire, no clear calculation of the means to be employed. The conscious factor must be wholly eliminated, in accounting for the result, if the brain has “an automatic action, uninfluenced by states of consciousness.” All the complicated actions which followed the receipt of the telegram might have been performed without the aid of consciousness, just as the frog whose spinal chord has been severed will draw up its foot when it is touched with acid. Consciousness is simply the fly upon the wheel imagining that it is driving the coach. But does not this account ignore the really significant thing in the whole history—the *meaning* ascribed to the telegram? The words, if read without being understood, might be a signal for action of some kind. But what action? This would not be decided until a meaning had been attached to the words—until the signal had been interpreted. Doubtless any action, however complicated, if performed habitually upon the reception of a given stimulus, will approximate to the type of reflex action; but that the course of conduct in question, wholly new and requiring at each step both careful calculation and quick decision, can be accounted for without the conscious factor, is as hard to believe as is “the production of molecular motion by consciousness.”

Both members of the psycho-physical parallelism seem to fall into hopeless discontinuity when the links of interaction which bind them together are broken. The gaps in both series must be filled in by metaphysical assumption not warranted by psychological experience. Our ordinary modes of thinking and speaking must also largely be modified, as we are warned by Prof. Wundt. When we speak, for instance, of the influence of mind over body, we must “always mean, if we do not say, that the word ‘influence’ is not to be taken *sensu stricto* :”† for no causal nexus must be asserted between incomparable phenomena. On the other hand, it is improper, strictly speaking, to say that the sun or the electric spark causes the sensation of light, for, on the theory of Wundt, “we must even suppose . . . that it is not the physical stimulus which occasions the sensation, but that this latter arises

* *Study of Religion*, Vol. ii, p. 238.

† *Lectures on Animal and Human Psychology*, page 449.

from *some elementary psychical processes lying below the limen of consciousness.*"* When we read a little later that "soul" has been banished from psychology "as a metaphysical surplusage for which psychology has no use,"† and remember the "elementary psychical processes lying below the limen of consciousness," which were assumed to account for our sensations, we see how hard it is even for a psychologist to avoid assumptions, and how hard it is to be consistently unmetaphysical.

The theory of a psycho-physical parallelism, in view of its difficulties, will hardly be accepted as the last word upon the problem of mind and brain. If we are to believe, however, in a real interaction between the mental and the physical spheres—between states of consciousness and molecular motion—what becomes of the doctrine of the conservation of energy? We must remember that while this is one of the most certain of the empirical generalizations of modern science, it is applicable strictly only to the transformation of one kind of physical energy into another. Energy expended in one form will reappear in another form or other forms in an equivalent amount, and under proper conditions might be changed back again into the original form without increase or loss. But states of consciousness cannot be expressed in numerical terms of more or less, and are wholly incomparable with any form of physical force. As to the mode in which physical processes and mental processes influence each other, we are, and it would seem must remain, wholly ignorant; but this should not lead us to deny the fact of their mutual influence. All physical causation is a mystery, but it is none the less certain that the impact of one billiard ball is the cause of the motion of another. We do not know how the volition to move the hand starts the discharge down the motor nerve, or how the agitation of nerve fibre and brain cell produces the sensation. But that in both cases the causal relation exists is, apart from metaphysics, as little to be denied as is the causal relation between any two phenomena in the physical world.

The physiological psychologist may rightly plead for the liberty to pursue his investigations and form his conclusions unhampered alike by metaphysical assumptions and by the generalizations of other sciences. His inferences must be based upon the phenomena of his own science, not upon the conclusions of another science. It is then, of course, the business of the philosopher to review the results of the separate sciences and to reconcile them, if he can. In the meantime he will protest against allowing a prin-

* *Lectures on Animal and Human Psychology*, page 450. The italics are ours.

† Page 454.

ciple of physics, applicable properly only to the correlation of physical forces, to prejudge the whole question of the relation between matter and mind.

It may be that we are no nearer than ever to the true answer to this question. "*Ignoramus*," we must modestly admit, even if we are not prepared to add, "*Ignorabimus*." Perhaps we shall be compelled to believe, as Prof. Tyndall has suggested, that the "mystery of Mind, which has hitherto defied its own penetrative power, . . . may ultimately resolve itself into a demonstrable impossibility of self-penetration." Meanwhile, it is safe to assert that the investigations of modern science which lie on the borderland between physiology and psychology have not made any less tenable our faith in the reality of spirit or of its attribute of freedom. We may still believe the testimony of consciousness, that we have power on our own selves and on the world, and may confidently trust in the great realities of

"That true world within the world we see,
Whereof our world is but the bounding shore."

OSSINING, N. Y.

WM. HALLOCK JOHNSON.