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MIND

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OF

PSYCHOLOGY AND PHILOSOPHY.

I.—ARE WE AUTOMATA?

EVERYONE is now acquainted with the Conscious-Automaton-theory to which Prof. Huxley[1] gave such publicity in his Belfast address; which the late Mr. D. A. Spalding punctiliously made the pivot of all his book-notices in *Nature;* which Prof. Clifford fulminated as a dogma essential to salvation in a lecture on "Body and Mind"[2]; but which found its earliest and ablest exposition in Mr. Hodgson's magnificent work, *The Theory of Practice.*[3] The theory maintains that in everything outward we are pure material machines. Feeling is a mere collateral product of our nervous processes, unable to react upon them any more than a shadow reacts on the steps of the traveller whom it accompanies. Inert, uninfluential, a simple passenger in the voyage of life, it is allowed to remain on board, but not to touch the helm or handle the rigging.

The theory also maintains that we are in error to suppose that our thoughts awaken each other by inward congruity or rational necessity, that disappointed hopes *cause* sadness, premisses conclusions, &c. The feelings are merely juxtaposed in that order without mutual cohesion, because the nerve-processes to which they severally correspond awaken each other in that order.

[1] *Fortnightly Review*, Vol. XVI., p. 555.
[2] *Ibid.*, p. 714. [3] Vol. I., pp. 416 ff.

It may seem strange that this latter part of the theory should be held by writers, who like Prof. Huxley have openly expressed their belief in Hume's doctrine of causality. That doctrine asserts that the causality we seem to find between the terms of a physical chain of events, is an illegitimate outward projection of the inward necessity by which we feel each thought to sprout out of its customary antecedent. Strip the string of necessity from between ideas themselves, and it becomes hard indeed for a Humian to say how the notion of causality ever was born at all.

This, however, is an *argumentum ad hominem* which need not detain us. The theory itself is an inevitable consequence of the extension of the notion of reflex action to the higher nerve-centres. Prof. Huxley starts from a decapitated frog which performs rational-seeming acts although probably it has no consciousness, and passing up to the hemispheres of man concludes that the rationality of their performances can owe nothing to the feelings that co-exist with it. This is the inverse of Mr. Lewes's procedure. He starts from the hemispheres, and finding their performances apparently guided by feeling concludes, when he comes to the spinal cord, that feeling though latent must still be there to make it act so rationally. Clearly such arguments as these may mutually eat each other up to all eternity.

The reason why the writers we speak of venture to dogmatise as they do on this subject, seems due to a sort of philosophic faith, bred like most faiths from an æsthetic demand. Mental and physical events are, on all hands, admitted to present the strongest contrast in the entire field of being. The chasm which yawns between them is less easily bridged over by the mind than any interval we know. Why then not call it an absolute chasm? And say not only that the two worlds are different, but that they are independent? This gives us the comfort of all simple and absolute formulas, and it makes each chain homogeneous to our consideration. When talking of nervous tremors and bodily actions, we may feel secure against intrusion from an irrelevant mental world. When, on the other hand, we speak of feelings, we may with equal consistency use terms always of one denomination, and never be annoyed by what Aristotle calls "slipping into another kind". The desire on the part of men educated in laboratories not to have their physical reasonings mixed up with such incommensurable factors as feelings is certainly very strong. Nothing is commoner than to hear them speak of conscious events as something so essentially vague and shadowy as even doubtfully to exist at all. I have heard a most intelligent

biologist say: "It is high time for scientific men to protest against the recognition of any such thing as consciousness in a scientific investigation". In a word, feeling constitutes the "unscientific" half of existence, and any one who enjoys calling himself a "scientist" will be too happy to purchase an untrammeled homogeneity of terms in the studies of his predilection, at the slight cost of admitting a dualism which, in the same breath that it allows to mind an independent status of being, banishes it to a limbo of causal inertness, from whence no intrusion or interruption on its part need ever be feared.

But Common Sense also may have its æsthetic demands, and among them may be a craving for unity. The spectacle of an ultimate and inexplicable dualism in the nature of things may be as unsatisfying as the obligation to calculate with heterogeneous terms. Two "aspects," *nemine adspiciente*, seem uncalled for. One may well refuse, until absolutely overpowered by the evidence, to believe that the world contains items which in no wise influence their neighbours; whose existence or non-existence need, so far as the remainder go, be taken into no account. It is a smoother and more harmonious thought to imagine all the items of the world without exception as interlocked in bonds of action and reaction, and forming a single dynamic whole.

And now, who shall decide between such rival æsthetic needs? *A priori* to shrink from a "chasm" between the objects of one's contemplation is as respectable as to dislike heterogeneity in the factors of one's reasoning operations. The truth is, then, that neither æsthetic motives nor ostensible reasons entitle us to decide between the Conscious-Automaton-theory and the theory of Common Sense. Both alike are conceptions of the possible, and for any one dogmatically to affirm the truth of either is, in the present state of our knowledge, an extremely unscientific procedure.

The question for us then is: Can we get light from any facts hitherto ignored in the discussion? Since the direct evidence of our living feeling is ruled out of court as mendacious, can we find circumstantial evidence which will incline the balance either way, and save us from the dreary strife of prejudice and prepossession?

I think we can, and propose in the remainder of this article to show that this presumptive evidence wholly favours the efficacity of Consciousness. Consciousness, namely, has been slowly evolved in the animal series, and resembles in this all organs that have a use. Since the mere supernumerary depicted by the Conscious-Automaton-theory would be useless, it follows

that if we can discover the utility of consciousness we shall overthrow that theory.

Our problem consequently is: Of what use to a nervous system is a superadded consciousness? Can a brain which has it function better than a brain without it? And to answer this question, we must know, first, the natural defects of the brain, and secondly, the peculiar powers of its mental correlate.

Since consciousness is presumably at its minimum in creatures whose nervous system is simple, and at its maximum in the hypertrophied cerebrum of man, the natural inference is that, as an *organe de perfectionnement*, it is most needed where the nervous system is highly evolved; and the form our first question takes is: What are the defects characteristic of highly evolved nervous centres?

If we take the actions of lower animals and the actions of lower ganglia in higher animals, what strikes us most in them is the determinateness with which they respond to a given stimulus. The addition of the cerebral hemispheres immediately introduces a certain incalculableness into the result, and this incalculableness attains its maximum with the relatively enormous brain-convolutions of man. In the beheaded frog the legs twitch as fatally when we touch the skin with acid as do a jumping-jack's when we pull the string. The machinery is as narrow and perfect in the one case as in the other. Even if all the centres above the cord except the cerebral hemispheres are left in place, the machine-like regularity of the animal's response is hardly less striking. He breathes, he swallows, he crawls, he turns over from his back, he moves up or down on his support, he swims and stops at a given moment, he croaks, he leaps forward two or three times—each and all with almost unerring regularity at my word of command, provided I only be an experienced physiologist and know what ganglia to leave and what particular spur will elicit the action I desire. Thus if I merely remove his hemispheres and tilt my hand down, he will crawl up it but not jump off. If I pinch him under the arm-pits, he will croak once for each pinch; if I throw him into water, he will swim until I touch his hands with a stick, when he will immediately stop. Over a frog with an entire brain, the physiologist has no such power. The signal may be given, but ideas, emotions or caprices will be aroused instead of the fatal motor reply, and whether the animal will leap, croak, sink or swim or swell up without moving, is impossible to predict. In a man's brain the utterly remote and unforeseen courses of action to which a given impression on the senses may give rise, is too notorious to need illustration. Whether we notice it at all depends on our mental pre-occupations at the moment. If we do notice it, our

action again depends on the "considerations" which it awakens, and these again may depend as much on our transient mood or on our latest experience as on any constant tendencies organised in our nature.

We may thus lay it down as an established fact that the most perfected parts of the brain are those whose action are least determinate. It is this very vagueness which constitutes their advantage. They allow their possessor to adapt his conduct to the minutest alterations in the environing circumstances, any one of which may be for him a sign, suggesting distant motives more powerful than any present solicitations of sense. Now it seems as if certain mechanical conclusions should be drawn from this state of things. An organ swayed by slight impressions is an organ whose natural state is one of unstable equilibrium. We may imagine the various lines of discharge in the cerebrum to be almost on a par in point of permeability—what discharge a given small impression will produce may be called accidental, in the sense in which we say it is a matter of accident whether a rain-drop falling on a mountain ridge descend the eastern or the western slope. It is in this sense that we may call it a matter of accident whether a woman's first child be a boy or a girl. The ovum is so unstable a body that certain causes too minute for our apprehension may at a certain moment tip it one way or the other. The natural law of an organ constituted after this fashion can be nothing but a law of caprice. I do not see how one could reasonably expect from it any certain pursuance of useful lines of reaction such as the few and fatally determined performances of the lower centres constitute within their narrow sphere. The dilemma in regard to the nervous system seems to be of the following kind. We may construct one which will react infallibly and certainly, but it will then be capable of reacting to very few changes in the environment—it will fail to be adapted to all the rest. We may, on the other hand, construct a nervous system potentially adapted to respond to an infinite variety of minute features in the situation; but its fallibility will then be as great as its elaboration. We can never be sure that its equilibrium will be upset in the appropriate direction. In short, a high brain may do many things, and may do each of them at a very slight hint. But its hair-trigger organisation makes of it a happy-go-lucky, hit-or-miss affair. It is as likely to do the crazy as the sane thing at any given moment. A low brain does few things, and in doing them perfectly forfeits all other use. The performances of a high brain are like dice thrown for ever on a table. Unless they be loaded, what chance is there that the highest number will turn up oftener than the lowest?

All this is said of the brain as a physical machine pure and simple. Can consciousness increase its efficiency by loading its dice? Such is our next problem.

But before directly attacking it, we must pause a moment to make sure that we clearly apprehend the import of such expressions as *useful discharge*, *appropriate direction*, *right reaction*, and the like, which we have been using. They all presuppose some Good, End or Interest to be the animal's. Until this goal of his salvation be posited, we have no criterion by which to estimate the utility of any of his reactions. Now the important thing to notice is that the goal cannot be posited at all *so long as we consider the purely physical order of* existence. Matter has no ideals. It must be entirely indifferent to the molecules of C, H, N and O, whether they combine in a live body or a dead one. What the present conditions fatally necessitate, that they do with equal infallibility and cheerfulness; whether the result of their action be the perfume of a rose or the odour of carrion, the words of a Renouvier or the crackling of thorns under a pot, it is brought forth with as little reluctance in the one case as in the other. Good involves the notion of less good, necessitates comparison, and for a drop of water either to compare its present state with an absent state or to compare its total self with a drop of wine, would involve a process not commonly thought of as physical. Comparison requires a *tertium quid*, a *locus*—call it what you will—in which the two outward existences may meet on equal terms. This forum is what is known as a consciousness. Even sensations cannot be supposed, simply as such, to be aware of their relations to each other. A succession of feelings is not (as James Mill reiterates) one and the same thing with a feeling of succession, but a wholly different thing. The latter feeling requires a self-transcendency of each item, so that each not only *is* in relation, but knows its relation, to the other. This self-transcendency of data constitutes the conscious form. Where we suppose it to exist we have mind; where mind exists we have it.

You may, it is true, ascribe mind to a physical process. You may allow that the atom engaged in some present energy has a dreamlike consciousness of residual powers and a judgment which says, "Those are better than this". You may make the rain-drop flowing downhill posit an impossible ascent as its highest good. Or you may make the C, H, N and O atoms of my body knowingly to conspire in its construction as the best act of which they are capable. But if you do this, you have abandoned the sphere of purely physical relations.

Thus, then, the words Use, Advantage, Interest, Good, find no application in a world in which no consciousness exists.

Things there are neither good nor bad; they simply are or are not. Ideal truth to exist at all requires that a mind also exist which shall deal with it as a judge deals with the law, really creating that which it professes only to declare.

But, granting such a mind, we must furthermore note that the direction of the verdict as to whether A or B be best, is an ultimate, arbitrary expression of feeling, an absolute fiat or decree. What feels good *is* good; if not it is only because it negates some other good which the same power of feeling stamps as a Better.[1]

Thus much, then, is certain, that in venturing to discuss the perfection and uses of the brain at all, we assume at the outset the existence of *some one's* consciousness to make the discussion possible by defining some particular good or interest as the standard by which the brain's excellence shall be measured. Without such measure Bismarck's brain is no better than a suicidal maniac's, for the one works as perfectly as the other to its end. Considered as mere existence, a festering corpse is as real as a live chancellor, and, for aught physics can say, as desirable. Consciousness in declaring the superiority of either one, simply creates what previous to its fiat had no existence. The judge makes the law while announcing it: if the judge be a maggot, the suicide's brain will be best; if a king, the chancellor's.

The consciousness of Mr. Darwin lays it down as axiomatic that self-preservation or survival is the essential or universal good for all living things. The mechanical processes of "spontaneous variation" and "natural selection" bring about this good by their combined action; but being physical processes they can in no sense be said to intend it. It merely floats off here and there accidentally as one of a thousand other physical results. The followers of Darwin rightly scorn those teleologists who claim that the physical process, as such, of evolution follows an ideal of perfection. But now suppose that not only our Darwinian consciousness, but with even greater energy the

[1] I have treated this matter of teleology being an exclusively conscious function more at length in an article on "Spencer's Definition of Mind" (*Journal of Speculative Philosophy*, Jan., 1878), to which I take the liberty of referring the reader. The fact that each consciousness simply *stakes* its ends and challenges the world thereby, is most conspicuous in the case of what is called Self-love. There the end staked by each mind is peculiar to itself, whilst in respect of other ends many minds may unite in a common position. But in their psychological essence these impersonal ends in no wise differ from self-interest. Abolish the minds to whom they seem good and they have no status; any more than the categorical imperative that perish who may John Smith must wax fat and prosper, has a *ratio existendi* after Smith's peculiar lusts have been annihilated.

consciousness of the creature itself, postulates survival as its *summum bonum*, and by its cognitive faculty recognises as well as Mr. Darwin which of its actions and functions subserves this good; would not the addition of causal efficacy to this consciousness enable it to furnish forth the means as well as fix the end—make it teleologically a fighter as well as a standard-bearer? Might not, in other words, such a consciousness promote or increase by its function of efficacity the amount of that "usefulness" on the part of the brain which it defines and estimates by its other functions? To answer such a question, we must analyse somewhat closely the peculiarities of the individual consciousness as it phenomenally presents itself to our notice.

If we use the old word category to denote every irreducibly peculiar form of synthesis in which phenomena may be combined and related, we shall certainly have to erect a category of consciousness, or what with Renouvier we may, if we prefer, call a category of personality. This category might be defined as the mode in which data are brought together for *comparison with a view to choice*.[1] Both these points, comparison and choice, will be found alike omnipresent in the different stages of its activity. The former has always been recognised; the latter less than it deserves.

Many have been the definitions given by psychologists of the essence of consciousness. One of the most acute and emphatic of all is that of Ulrici, who in his *Leib und Seele* and elsewhere exactly reverses the formula of the reigning British school, by calling consciousness a discriminating activity—an *Unterscheidungsvermögen*. But even Ulrici does not pretend that consciousness creates the differences it becomes aware of in its objects. They pre-exist and consciousness only discerns them; so that after all Ulrici's definition amounts to little more than saying that consciousness is a faculty of cognition—a rather barren result. I think we may go farther and add that the powers of cognition, discrimination and comparison which it possesses, exist only for the sake of something beyond themselves, namely, Selection. Whoever studies consciousness, from any point of view whatever, is ultimately brought up against the mystery of *interest* and *selective attention*. There

[1] Neither 'association' nor 'dissociation' is synthesis of a peculiar kind; they are mere generic modes, and are wholly unfit to serve as *differentiae* of psychical phenomena in any general philosophical classification. Comparison and choice, on the contrary, are each *sui generis*. Let it not be said that a magnet compares the different filings in a machine-shop to choose the iron filings from the heap. There is no proof that the brass filings appeal to it at all. In comparison, both terms equally appeal to consciousness.

are a great many things which consciousness *is* in a passive and receptive way by its cognitive and registrative powers. But there is one thing which it *does*, *sua sponte*, and which seems an original peculiarity of its own; and that is, always to choose out of the manifold experiences present to it at a given time some one for particular accentuation, and to ignore the the rest. And I shall now show how, from its simplest to its most complicated forms, it exerts this function with unremitting industry.

To begin at the bottom, even in the infra-conscious region which Mr. Spencer says is the lowest stage of mentality. What are our senses themselves but organs of selection? Out of the infinite chaos of movements, of which physics teaches us that the outer world consists, each sense-organ picks out those which fall within certain limits of velocity. To these it responds, but ignores the rest as completely as if they did not exist. It thus accentuates particular movements in a manner for which objectively there seems no valid ground; for, as Lange says, there is no reason whatever to think that the gap in nature between the highest sound-waves and the lowest heat-waves is an abrupt break like that of our sensations, or that the difference between violet and ultra-violet rays has anything like the objective importance subjectively represented by that between light and darkness. Out of what is in itself an undistinguishable, swarming *continuum*, devoid of distinction or emphasis, our senses make for us, by attending to this motion and ignoring that, a world full of contrasts, of sharp accents, of abrupt changes, in a word, of picturesque light and shade.

If the sensations we receive from a given organ have their causes thus picked out for us by the conformation of the organ's termination, the attention, on the other hand, out of all the sensations yielded, picks out certain ones as worthy of its notice and suppresses all the rest. Helmholtz's immortal work on *Physiological Optics* is little more than a study of those visual sensations of which common men never become aware—blind spots, *muscae volitantes*, after-images, irradiation, chromatic fringes, marginal changes of colour, double images, astigmatism, movements of accommodation and convergence, retinal rivalry, and more besides. We do not even know, as Professor William B. Rogers pointed out, on which of our eyes an image falls, until trained to notice the local sensation. So habitually overlooked is this by most men that one may be blind for years of a single eye and not know it.[1]

[1] If one cared to indulge in *à priori* constructions *à la* Spencer, one might easily show how the differentiation of sense-organs arose in the primitive polyp through this reinforcement by a selective attention (sup-

Helmholtz says we only use our sensations as *signs*. The sensations from which we avert our attention are those which are valueless as tokens of the presence of objective things. These *things* are called the Objects of perception. But what are *they?* Nothing, as it seems to me, but groups of coherent sensations. This is no place to criticise Helmholtz's treatment of perception, but I may say, in passing, that I think his rather indefinite and oracular statements about the part played by the intellect therein have momentarily contributed to retard psychological inquiry. We find the Kantian philosophers everywhere hailing him as the great experimental corroborator of their master's views. They say he has proved the present sensation to have nothing to do with the construction of the Object—that is an original act of the intellect which the sensation merely instigates but does not furnish forth: it contains ultra-sensational elements. All that Helmholtz really *does* prove is, that the so-called Object is constituted of *absent* sensations. What he has not explicitly noticed is, that among these the mind picks out certain particular ones to be more essential and characteristic than the rest. When, for example, on getting a peculiar retinal sensation with two acute and two obtuse angles, I *perceive* a square table-top, which thus contradicts my present image; what is the *squareness* but one out of an infinite number of possible retinal sensations which the same object may yield? From all these the mind, for æsthetic reasons of its own, has singled out this one and chosen to call it the object's essential attribute? Were room here given, I think it might be shown that perception involves nothing beyond association and selection. The antithesis is not, as Helmholtz's admirers would have it, between sensations on the one hand as signs and original intellectual products, materially different from

posed efficacious) of particular portions of the feeling yielded by an organ already nascent. The integument of the animal might, for instance, at first be affected both by light-vibrations and by those far below them. But if the former were picked out by the consciousness as most interesting, the nervous movements would soon grow more and more harmonious with them, and more and more out of tune with the rest. An optic nerve and retina would thus result. One might corroborate this reasoning by pointing to what happens in cases of squint. The squinting eye gives double images which are so inconvenient that the mind is forced to abstract its attention from them. This resolute refusal to attend to the sensations of one eye soon makes it totally blind. It would seem, indeed, that the attention positively suppressed the function of the retina, for the presence of cataract which keeps the image from it altogether, results in no such paralysis. I do not insist on this point, partly because such speculation is rather cheap—"all may raise the flowers now, for all have got the seed"—and partly because there seems some reason to doubt whether the usually received explanation of strabismic blindness be correct.

sensations on the other, as Objects. It is between present sensations as signs and certain absent sensations as Objects, these latter being moreover arbitrarily selected out of a large number as being more objective and real than the rest. The real form of the circle is deemed to be the sensation it gives when the line of vision is perpendicular to its centre—all its other sensations are signs of this sensation. The real sound of the cannon is the sensation it makes when the ear is close by. The real colour of the brick is the sensation it gives when the eye looks squarely at it from a near point, out of the sunshine and yet not in the gloom; under other circumstances it gives us other colour-sensations which are not signs of this—we then see it looks pinker or blacker than it really is. The reader knows no object which he does not represent to himself by preference as in some typical attitude, of some normal size, at some characteristic distance, of some standard tint, &c., &c. But all these essential characteristics, which together form the genuine objectivity of the thing and are contrasted with the subjective sensations we may happen to get from it at a given moment, are themselves sensations pure and simple, susceptible of being fully given at *some* other moment. The spontaneity of the mind does not consist in conjuring up any new non-sensational quality of objectivity. It consists solely in deciding what the particular sensation shall be whose native objectivity shall be held more valid than that of all the rest.[1]

Thus perception involves a twofold choice. Out of all present sensations, we notice mainly such as are significant of absent ones: and out of all the absent associates which these suggest, we again pick out a very few to be the bearers *par excellence* of objective reality. We could have no more exquisite example of the mind's selective industry.

That industry goes on to deal with the objects thus given in perception. A man's Empirical Thought depends on the objects

[1] When I say Objects are wholly formed of associated and selected sensations, I hope the reader will not understand me to profess adhesion to the old atomic doctrine of association, so thoroughly riddled of late by Professor Green. The association of sensations of which I speak, presupposes comparison and memory which are functions not given in any one sensation. All I mean is, that these mental functions are already at work in the first beginnings of sensation and that the simplest changes of sensation moreover involve consciousness of all the categories—time, space, number, objectivity, causality. There is not first a passive act of sensation proper, followed by an active production or projection ("inference") of the attributes of objectivity by the mind. These all come to us together with the sensible qualities, and their progress from vagueness to distinctness is the only process psychologists have to explain. What I mean to say in the text is, that this process involves nothing but association and selection, all new production of either material or formal elements being denied.

and events he has experienced, but what these shall be is to a large extent determined by his habits of attention. An object may be present to him a thousand times, but if he persistently fails to notice it, it cannot be said to enter into his experience. We are all seeing flies, moths, and beetles by the thousand, but to whom, save an entomologist, do they say anything distinct? On the other hand, an object met only once in a life-time may leave an indelible experience in the memory. Let four men make a tour in Europe. One will bring home only picturesque impressions—costumes and colours, parks and views and works of architecture, pictures and statues. To another all this will be non-existent; and distances and prices, populations and drainage-arrangements, door- and window-fastenings, and other useful statistics will take their place. A third will give a rich account of the theatres, restaurants, and public balls, and naught beside; whilst the fourth will perhaps have been so wrapped in his own subjective broodings as to tell little more than a few names of places through which he passed. Each has selected, out of the same mass of presented objects, those which suited his private interest and has made his experience thereby.

If, now, leaving the empirical combination of objects, we ask how the mind proceeds *rationally* to connect them we find selection again to be omnipotent. In an article on "Brute and Human Intellect" in the *Journal of Speculative Philosophy*, July 1878, p. 236, I have tried to show that all Reasoning depends on the ability of the mind to break up the totality of the phenomenon reasoned about into partial factors or elements, and to pick out from among these the particular one which, in our given theoretical or practical emergency, may lead to the proper conclusion. Another predicament will need another conclusion, and require another element to be picked out. The man of genius is he who will always stick-in his bill, as it were, at the right point, and bring it out with the right element—"reason" if the emergency be theoretical, "means" if it be practical—transfixed upon it? Association by similarity I have shown to be an important help to this breaking-up of represented things into their elements. But this association is only the minimum of that same selection of which picking out the right reason is a maximum. I here confine myself to this brief statement, but it may suffice to show that Reasoning is but another form of that selective activity which appears to be the true sphere of mental spontaneity.

If now we pass to the Æsthetic activity of the mind, the application of our law is still more obvious. The artist notoriously selects his items, rejecting all tones, colours, shapes, which do not harmonise with each other and with the main purpose of

his work. That unity, harmony, "convergence of characters," as M. Taine calls it, which gives to works of art their superiority over works of nature, is wholly due to *elimination*. Any natural subject will do, if the artist has wit enough to pounce upon some one feature of it as characteristic, and suppress all merely accidental items which do not harmonise with this.

Ascending still higher we reach the plane of Ethics, where choice reigns notoriously supreme. An act has no ethical quality whatever unless it be chosen out of several all equally possible. To sustain the arguments for the good course and keep them ever before us, to stifle longing for more flowery ways, to keep the foot unflinchingly on the arduous path, these are characteristic ethical energies. But more than these; for these but deal with the means of compassing interests already felt by the man to be supreme. The ethical energy *par excellence* has to go farther and choose which interest out of several equally coercive shall become supreme. The issue here is of the utmost pregnancy, for it decides a man's entire career. When he debates, Shall I commit this crime? choose that profession? accept that office, or marry this fortune?—his choice really lies between one of several equally possible future *Selves*. What his entire empirical *Ego* shall become, is fixed by the conduct of this moment. Schopenhauer, who enforces his determinism by the argument that with a given fixed character only one reaction is possible under given circumstances, forgets that, in these critical ethical moments, what consciously *seems* to be in question is the very complexion of the character. The problem with the man is less what act he shall now choose to do, than what kind of a being he shall now resolve to become.

Looking back then over this review we see that the mind is at every stage a theatre of simultaneous possibilities. Consciousness consists in the comparison of these with each other, the selection of some, and the suppression of the rest by the reinforcing and inhibiting agency of Attention. The highest and most elaborated mental products are filtered from the data chosen by the faculty next beneath out of the mass offered by the faculty below that, which mass in turn was sifted from a still larger amount of yet simpler material, and so on. The highest distillate thus *represents* in the last analysis nothing but sensational elements. But this is far from meaning that it implies nothing but passive faculty of sensation. As well might one say that the sculptor is passive, because the statue stood from eternity within the stone. So it did, but with a million different ones beside it. The world as a Goethe feels and knows it all lay embedded in the primordial chaos of sensa-

tions, and into these elements we may analyse back every thought of the poet. We may even, by our reasonings, unwind things back to that black and jointless continuity of space and moving clouds of swarming atoms which science calls the only real world. But all the while the world we feel and live in, will be that which our ancestors and we, by slowly cumulative strokes of choice, have extricated out of this, as the sculptor extracts his statue by simply rejecting the other portions of the stone. Other sculptors, other statues from the same stone! Other minds, other worlds from the same chaos! Goethe's world is but one in a million alike embedded, alike real to those who may abstract them. Some such other worlds may exist in the consciousness of ant, crab and cuttle-fish.

After this perhaps too long analysis let us now look back. We have found that the unaided action of the cerebral hemispheres would probably be random and capricious; that the nerve-process likely to lead to the animal's interests would not necessarily predominate at a given moment. On the other hand, we have found that an impartial consciousness is a non-entity, and that of the many items that ever occupy our mental stage Feeling always selects one as most congruous with the interests it has taken its stand upon. Collating these two results, an inference is unavoidable. The "items" on the mental stage are the subjective aspects of as many nerve-processes, and in emphasising the representations congruous with conscious interest and discouraging all others, may not Attention actually reinforce and inhibit the nerve-processes to which the representations severally correspond?

This of course is but a hypothetical statement of the verdict of direct personal feeling—a verdict declared mendacious by Professor Clifford. But the intricate analysis by which it has been reached gives it great plausibility. I shall strengthen the probability by further facts in a moment. But I beg the reader to notice here the limitations of the power of Feeling, if power there be. All the possibilities of representation, all the images are furnished by the brain. Consciousness produces nothing, it only alters the proportions. Even the miraculous action of free will can only consist in the quantitative reinforcement of representations already given qualitatively. A sonorous plate has no proper note of its own. It is almost impossible by scraping it to reproduce twice an identical tone. The number of Chladni's sand-figures it will furnish is as inexhaustible as the whimsies which may turn up in a brain. But as the physicist's finger pressing the plate here or there determines nodal points that throw the sand into shapes of relative fixity,

so may the accentuating finger of consciousness deal with the fluctuating eddies in the cerebral cortex.

That these eddies are stirred by causes that have no connection with either dominant interests or present impressions seems manifest from the phenomena of dreaming. The chaotic imagery there appears due to the unequal stimulus of nutrition in different localities. But if an accidental variation in nutrition is sufficient to determine the brain's action, what safeguard have we at any time against its random influence? It may of course be reasonably objected that the exceptional state of sleep can afford no proper clue to the brain's operations when awake. But Maury in his classic work, *Le Sommeil*, has conclusively proved the passage of dreams through "hypnagogic hallucinations" into that meteoric shower of images and suggestions, irrelevant to the main line of thought, the continual presence of which every one who has once had his *interest awakened* in the subject, will without difficulty recognise in himself. Ordinarily these perish in being born, but if one by chance saunters into the mind, which *is* related to the dominant pursuit of the moment, presto! it is pounced upon and becomes part of the empirical *Ego*. The greatest inventions, the most brilliant thoughts often turn up thus accidentally, but may mould for all that the future of the man. Would they have gained this prominence above their peers without the watchful eye of consciousness to recognise their value and emphasise them into permanence?

> Nur allein der *Mensch*
> Vermag das Unmögliche.
> Er unterscheidet, wählet und richtet,
> Er kann dem Augenblick
> Dauer verleihen.

The hypothesis we are advocating might, if confirmed, considerably mitigate one of the strongest objections to the credibility of the Darwinian theory. A consciousness which should not only determine its brain to prosperous courses, but also by virtue of that hereditary influence of habit (nowadays so generally believed in by naturalists) should organise from generation to generation a nervous system more and more mechanically incapable of wandering from the lines of interest chosen for it at first, would immensely shorten the time and labour of natural selection. Mr. Darwin regards animated nature as a sort of table on which dice are continually being thrown. No intention presides over the throwing, but lucky numbers from time to time fortuitously turn up and are preserved. If the ideas we have advanced concerning the instability of a complicated cerebrum be true, we should have a sort of extension of this reign of accident into the functional life of

every individual animal whose brain had become sufficiently evolved. As his body morphologically was the result of lucky chance, so each of his so-called acts of intelligence would be another; and ages might elapse before out of this enormous lottery-game a brain should emerge both complex and secure. But give to consciousness the power of exerting a constant pressure in the direction of survival, and give to the organism the power of growing to the modes in which consciousness has trained it, and the number of stray shots is immensely reduced, and the time proportionally shortened for Evolution. It is, in fact, hard to see how without an effective superintending ideal the evolution of so unstable an organ as the mammalian cerebrum can have proceeded at all.

That consciousness should only be intense when nerve-processes are retarded or hesitant, and at its minimum when nerve-action is rapid or certain, adds colour to the view that it is efficacious. Rapid, automatic action is action through thoroughly excavated nerve-tracks which have not the defect of uncertain performance. All instincts and confirmed habits are of this sort. But when action is hesitant there always seem several alternative possibilities of nervous discharge. The feeling awakened by the nascent excitement of each nerve-track seems by its attractive or repulsive quality to determine whether the excitement shall abort or shall become complete. Where indecision is great, as before a dangerous leap, consciousness is agonisingly intense. Feeling, from this point of view, may be likened to a cross-section of the chain of nervous discharge, ascertaining the links already laid down, and groping among the fresh ends presented to it for the one which seems best to fit the case.

The remarkable phenomena of "vicarious function" in the nervous centres form another link in our chain of circumstantial evidence. A machine in working order functions fatally in one way. Our consciousness calls this the right way. Take out a valve, throw a wheel out of gear or bend a pivot, and it becomes a different machine, functioning just as fatally in another way which we call the wrong way. But the machine itself knows nothing of wrong or right: matter has no ideals to pursue. A locomotive will carry its train through an open drawbridge as cheerfully as to any other destination.

A brain with part of it scooped out is virtually a new machine, and during the first days after the operation functions in a thoroughly abnormal manner. Why, if its performances blindly result from its structure, undirected by any feeling of purpose, should it not blindly continue now to throw off inappropriate acts just as before its mutilation it produced appropriate ones? As a matter of fact, however, its performances become from day

to day more normal, until at last a practised eye may be needed to suspect anything wrong. If we suppose the presence of a mind, not only taking cognisance of each functional error, but able to exert an efficient pressure to inhibit it if it be a sin of commission, to lend a strengthening hand if the nerve-defect be a weakness or sin of omission,—nothing seems more natural than that the remaining parts of the brain, assisted in this way, should by virtue of the principle of habit grow back to the old teleological modes of exercise for which they were at first incapacitated. Nothing, on the contrary, seems at first sight more unnatural than that they should vicariously take up the duties of a part now lost without those *duties as such* exerting any persuasive or coercive force.[1]

There is yet another set of facts which seem explicable by the supposition that consciousness has causal efficacity. It has long been noticed that pleasures are generally associated with beneficial, pains with detrimental, experiences. All the fundamental vital processes illustrate this law. Starvation, suffocation, privation of food, drink and sleep, work when exhausted, burns, wounds, inflammation, the effects of poison, are as disagreeable as filling the hungry stomach, enjoying rest and sleep after fatigue, exercise after rest, and a sound skin and unbroken bones at all times, are pleasant. Mr. Spencer, in the chapter of his *Psychology* entitled "Pleasures and Pains," has suggested that these coincidences are due, not to any pre-established harmony, but to the mere action of natural selection which would certainly kill off in the long run any breed of creatures to whom the fundamentally noxious experience seemed enjoyable. An animal that should take pleasure in a feeling of suffocation would, if that pleasure were efficacious enough to make him immerse his head in water, enjoy a longevity of four or five minutes. But if pleasures and pains have no efficacity, one does not see (without some such *à priori* rational harmony as would be scouted by the "scientific" champions of the Automaton-theory) why the most noxious acts, such as burning, might not give a thrill of delight, and the most necessary ones, such as breathing, cause agony.[2] The exceptions to this law

[1] This argument, though so striking at first sight, is perhaps one which it would be dangerous to urge too dogmatically. It may be that restitution of cerebral function is susceptible of explanation on drainage-principles, or, to use Stricker's phrase, by "collateral innervation". As I am preparing a separate essay on this subject, I will say no more about the matter here.

[2] I do not overlook an obvious objection suggested by such an operation as breathing. It, like other motor processes, results from a tendency to nervous discharge. When this takes place immediately, hardly any feeling but the

are, it is true, numerous, but relate to experiences that are either not vital or not universal. Drunkenness, for instance, which though noxious is to many persons delightful, is a very exceptional experience. But, as the excellent physiologist Fick remarks, if all rivers and springs ran alcohol instead of water, either all men would hate it or our nerves would have been selected so as to drink it with impunity. The only very considerable attempt, in fact, that has ever been made to explain the *distribution* of our feelings is that of Mr. Grant Allen in his suggestive little work *Physiological Æsthetics;* and his reasoning is based exclusively on that causal efficacity of pleasures and pains which the "double-aspect" partisans so strenuously deny.

Thus, then, from every point of view the circumstantial evidence against that theory is very strong. *A priori* analysis of both brain and conscious action shows us that if the latter were efficacious it would, by its selective emphasis, make amends for the indeterminateness of the former; whilst the study *à posteriori* of the *distribution* of consciousness shows it to be exactly such as we might expect in an organ added for the sake of steering a nervous system grown too complex to regulate itself. The conclusion that it is useful is, after all this, more than justifiable. But, if it is useful, it must be so through its efficaciousness, and the Conscious-Automaton-theory must succumb to the theory of Common Sense.

Our discussion might fairly stop here save for the possible difficulty some readers may have in appreciating the full utility of having certain nervous possibilities emphasised above the rest. The measure of all utility is, as we have seen, some standard posited by Desire. The standard of survival or self-preservation is most potent. But there exist a host of other standards, æsthetic and moral, imperative so long as they do not conflict with this one and sometimes imperative over this one. In the preliminary selection by the senses of certain objective orders of movement, it is difficult to see what standard

rather negative one of ease results. When, however, a nervous discharge is checked it is a universal law that consciousness of a disagreeable kind is awakened, reaching in the case of suffocation the extremity of agony. An Automatist may then say that feeling here, so far from playing a dynamic part, is a mere passive index or symptom of certain mechanical happenings; and if here, then elsewhere. It may be replied that even were this true of completely habitual acts like breathing, where the nervous paths have been thoroughly organised for generations, it need not be true of hesitant acts not yet habitual; it need not be true of pains and pleasures, such as hunger and sleep, *not* connected with motor discharge; and even in the instance chosen it leaves out the possibility that the nervous mechanism, now automatically perfect, may have become so by slowly organised habit acquired under the guidance of conscious feeling.

is subserved. The utility of not having a sense for magnetism when we have one for heat, is not obvious. We may at most suspect a possible æsthetic brightness and clearness to result from the wide intervals. But passing by this obscure region we see without the least difficulty why we ignore those ingredients of sensation which are not signs of things. What the peculiarity is in itself which makes Smith's voice so different from Brown's, we need never inquire so long as whenever we hear it we say, "There is Smith". For our practical interest in recognising whom we have to deal with outweighs our interest in the shades of sound *per se*. The selection again of certain attitudes, expressions, &c., in Smith, to stand as characteristic of him so that when others are present we say, "He does not look like himself," and if he is sitting to us for his portrait we spend an hour perhaps in placing him and lighting him so as to bring out with the utmost clearness these selected traits—this selection, I say, is equally explicable by various æsthetic standards, permanency, simplicity, harmony, clearness, and the like. Passing now from traits to *things*, the utility of selection is obviously created and measured by the interests the man has made his own. If Edward never walks out without finding a four-leafed clover, while Oliver dies of old age without having seen one, this is merely due to the fact that Edward has somehow been led to stake his happiness on that particular branch of discovery, and out of a visual field identical with that of Oliver has picked the details that minister to this somewhat arbitrary interest. Granted the interest, we cannot deny the use of the picking-out power. That Edward, having this interest in common with many others, should finally succeed in emphasising certain of those others and suppressing this, would be an example of the utility of selection in the ethical field, supposing always that the new interest chosen were of a higher order and not, like making puns, for example, as trivial an end as the one forsaken.

In the ethical field the importance of choosing one's paramount interest is universally recognised. But it is not so commonly known how, when the interest is once fixed upon, the selective activity must ceaselessly work to detect its presence or absence in each emergency that turns up. Take, for example, an inebriate struggling with temptation. The glass is before him, and the act of drinking has an infinity of aspects and may be defined in as many ways. If he selected the aspect of its helping him to write an article, of its being only lager-beer, of its being the fourth of July, of his needing it as medicine, of his never having formally signed the pledge, of this particular drink "not counting," or else of its giving him the strength to make a much more powerful resolution for the future than any of his

previous ones, or whatever other sophistries his appetite may instigate, he does but accentuate some character really contained in the act, but needing this emphasising pressure of his attention to be erected into its essence. But if, out of all the teeming suggestions with which the liquor before him inspires his brain, respectively saying, "It is a case of this good, of that interest, of yonder end," his mind pounces on one which repeats, "*It is essentially a case of drunkenness!*" and never lets that go, his stroke of classification becomes his deed of virtue. The power of choosing the right name for the case is the true moral energy involved, and all who posit moral ends must agree in the supreme utility of, at least, this kind of selective attention.

But this is only one instance of that substitution for the entire phenomenon of one of its partial aspects which is the essence of all reasoned thought as distinguished from mere habitual association. The utility of reasoned thought is too enormous to need demonstration. A reasoning animal can reach its ends by paths on which the light of previous experience has never shone. One who, on the contrary, cannot break up the total phenomenon and select its essential character must wait till luck has already brought it into conjunction with his End before he can guess that any connexion obtains between the two. All this is elaborated in the article "On Brute and Human Intellect" to which I have ventured to refer the reader. In that article (p. 274) I stated that I had found it impossible to symbolise by any mechanical or chemical peculiarity that tendency of the human brain to focalise its activity on small points which seems to constitute the essence of its reasoning power. But if such focalisation be really due not so much to structural peculiarity as to the emphasising power of an efficacious consciousness superadded, the case need no longer perplex us.

Of course the materialist may still say that the emphasised attention obeys the strongest vibration and does not cause it, that we will what we do, not do what we will,—that, in short, interest is passive and at best a *sign* of strength of nerve-disturbance. But he is immediately confronted by the notorious fact that the strongest tendencies to automatic activity in the nerves often run most counter to the selective pressure of consciousness. Every day of our lives we struggle to escape some tedious tune or odious thought which the momentary disposition of the brain keeps forcing upon us. And, to take more extreme cases, there are murderous tendencies to nervous discharge which, so far from involving by their intensity the assent of the will, cause their subjects voluntarily to repair to asylums to escape their dreaded tyranny. In all these cases of *voluntas paradoxa* or *invita*, the individual selects out of the two possible selves

yielded by his cerebral powers one as the true *Ego;* the other he regards as an enemy until at last the brain-storm becomes too strong for the helmsman's power. But even in the depths of mania or of drunkenness the conscious man can steady himself and be rational for an instant if a sufficient motive be brought to bear. He is not dead, but sleepeth.

I should be the last to assert that the Common-Sense-theory leaves no difficulties for solution. I feel even more strongly than Professors Huxley and Clifford that the only *rational nexus* is that of identity, and that feeling and nerve-tremor are disparate. I feel too that those who smile at the idea of calling consciousness an "organ," on a par with other organs, may be moved by a fundamentally right instinct. And I moreover feel that that unstable equilibrium of the cerebrum which forms the pivot of the argument just finished may, with better knowledge, be found perfectly compatible with an average appropriateness of its actions taken in the long run. But with all these concessions made, I still believe the Common-Sense-theory to merit our present credence. Fragmentary probabilities supported by the study of details are more worthy of trust than any mere universal conceptions, however tempting their simplicity. Science has won all her credit by the former kind of reasoning, Metaphysics has lost hers by the latter. The impossibility of motion, of knowledge, either subjective or objective, are proved by arguments as good as that which denies causality to feeling, because of its disparity with its effects. It is really monstrous to see the *prestige* of "Science" invoked for a materialistic conclusion, reached by methods which, were they only used for spiritualistic ends, would be hooted at as antiscientific in the extreme. Our argument, poor as it is, has kept at any rate upon the plane of concrete facts. Its circumstantial evidence can hardly be upset until the Automaton-theorists shall have condescended to make or invoke some new discoveries of detail which shall oblige us to reinterpret the facts we already know. But in that case I feel intimately persuaded that the reinterpretation will be so wide as to transform the Automaton-theory as thoroughly as the popular one. The Automaton-theory in its present state contents itself with a purely negative deliverance. There is a chasm, it says, between feeling and act. Consciousness is impotent. It exists, to be sure, but all those *manners* of existence which make it seem relevant to our outward life are mere meaningless coincidences, inexplicable parts of the general and intimate irrationality of this disjointed world. What little continuity and reason there seems to be, it says, lies wholly in the field of molecular physics.

Thither Science may retreat and hump her strong back against the mockeries and phantasms that people the waste of Being around.

Now the essence of the Common-Sense-theory, I take it, is to negate these negations. It obstinately refuses to believe Consciousness irrelevant or unimportant to the rest. It is there for a purpose, it has a meaning. But as all meaning, relevancy and purpose are symbolised to our present intelligence in terms of action and reaction and causal efficacy, Common Sense expresses its belief in the worth of Feeling by refusing to conceive of it out of these relations. When a philosophy comes which, by new facts or conceptions, shall show how particular feelings may be destitute of causal efficacy without the genus Feeling as a whole becoming the sort of *ignis fatuus* and outcast which it seems to be to-day to so many "scientists" (loathly word!), we may hail Professors Huxley and Clifford as true prophets. Until then, I hold that we are incurring the slighter error by still regarding our conscious selves as actively combating each for his interests in the arena and not as impotently paralytic spectators of the game.

WM. JAMES.

II.—ON DISCORD.

MR. GRANT ALLEN, in his recent book on *Physiological Æsthetics*, adopted the words "maximum of stimulation with minimum of fatigue" as the general formula for the conditions of peripheral stimulation most favourable to pleasure in the case of the higher sense-organs. I wish to point out some considerations which seem to detract from the value and generality of this formula. One obvious objection may be seen at once to be the use of the subjective word "fatigue" for the expression of objective phenomena in physiology: and it is ultimately owing, as I believe, to this dangerous and misleading use that the other weak points in the formula, if such indeed they prove to be, easily escape detection.

To illustrate my first objection, we may take a case or two where the sort of ratio expressed in the formula seems familiar to us. We say, for instance, that a skilful violinist extracts from his strings the maximum of transverse with the minimum of longitudinal vibration; or that mountain-air enables us to walk a maximum number of miles with a minimum of fatigue. In either case the two terms of the ratio are clearly distinct things, which may be conceived as increasing together or decreasing together, or one of which may increase as the other decreases.