The thoroughgoing concomitance of Mind and Body is here taken for granted as being all but universally allowed. The question, however, still remains how far the study of bodily organs and processes is of avail in psychological inquiries. Nobody maintains that these organs and processes can be entirely left out of account; they never have been and never can be so treated. Expressions are sometimes used incautiously that would seem to contend for the total neglect and dismissal of the physical side. Dr. Ward remarks that psychology knows nothing of muscle and nerve; yet the dying Emperor Hadrian, in the farewell address to his soul, cannot refrain from regarding it as hospes comesque corporis. Mr. Stout (Proc. Aristotelian Society, i. 1) argues the pros and cons with much minuteness, and decides as follows:—

"As regards present achievement, I am disposed to assert that the help which psychology has received from the physiology of the brain is even less than the little which the physiology of the brain has received from psychology". Mr. Bradley, in discussing the important question of the psychical origin of our sense of activity (Mind xi. 321),
refuses to accept any considerations derived from physiology. In such a question, one extreme may be as bad as another. Those that refuse all possible aid from physiology to psychology, have overlooked the lengths whereof we are already committed in the physical rendering of psychical facts. What they dwell upon most particularly is the very little that we know of brain-workings. Now, undoubtedly, it is true that we know little of those workings, but it is not true that we do not know anything. Moreover, as will be seen afterwards, the workings of nerve and brain are incontinently referred to in the common modes of speaking of mind. But the objectors to a physiological rendering of mental facts would find themselves involved in much deeper contradictions with usage, if, instead of speaking of nerves, they would refer to organs of sense and movement. The help rendered to the classing of our Sensations in their proper psychical character, has never been refused to psychology since Aristotle; while to reject all consideration of Movement would require the treatment both of Emotion and of Will to begin de novo, and the attempt would infallibly break down.

It would seem, then, that an inquiry into the exact limits of the reference to the bodily functions, in speaking of the mind, has still to be made. The facts involved cover a wide area, and the illustration must be proportionally wide.

One very important clearance of the ground consists in a review of the psychical vocabulary, its character, and sources. The mixture of the psychical with the physical is such as to prove that mental processes, however distinct from bodily processes, have never owned even a vocabulary of their own.

Survey of the Vocabulary of Mind. A glance at the existing terminology of mind will easily show how it has been made up, and how indispensable material accompaniments have been in the process. The vocabulary, in its greater part, is due to the Greeks and Romans, although every people possessed of a language has supplied some of the names. We see that these names were, in the first instance, purely material; while, by exclusive appropriation to mental facts, many have more or less completely parted with their material signification, and suggest only the subjective meanings. Take as a few examples, spirit, recollection, conception, intuition, emotion, irritation, impression, expression, sentiment, excitement, conscience, comfort, sympathy, delight, memory, discrimination, relativity, images, ideas. This class of words may be regarded as faded or worn-out figures of speech—metaphors or metonymies of material origin: while,
to all intents and purposes, they are now mental or subjective; so that when they are used we are not led to any material meaning, least of all to any definite physical accompaniment of the mental state. Another class of names, also applicable to mind, still preserve their material meaning; that meaning being in some instances the strict material accompaniment. Such are the terms—move, elation, life, trembling, grief, hatred, soothing, restlessness, blush, sore, wound, sleepy, scald, fever, agitation, commotion, staring, smiling, frowning, shock, throb, tension.

A little examination will divide those physical accompaniments, that have been adopted also as names for mental states proper, into emotional adjuncts and voluntary adjuncts; that is to say, some are the expression of the emotional wave, as smile, frown, tremble, blush, shock; others give the voluntary act consequent on feeling, as stretch, strain, pursue, avoid. There is nothing illegitimate in either class of words; the material application does not detract from the propriety of the mental. What is more, it is an actual help and support. In order to conceive mental states with anything like clearness or force, we need all the suggestiveness that their well-known adjuncts can provide. This is a point now to consider.

Cases where the Material Adjuncts are helpful. Perhaps the most remarkable of these cases is the sensations of the five senses. In classifying, describing, and studying these sensations, we are very much aided by the study of the physical organs. Unnoticed shades of sensation can be suggested by these, while subjective characters can be confirmed by the known objective distinctions. It has never been proposed to go fully into the special sensations without reference to what physiology tells us of the organs; while, on the other hand, the subjective distinctions, when unusually well marked, furnish a clue to the physical or objective embodiments. Instances of this will occur as we proceed. So it is with the expository delineation of the different sensations within each kind of sense; a little knowledge of the physiology prepares us for imbibing and comprehending the psychological classes.

It is needless to make a parallel illustration from the Emotions, where the double language of mind is so useful and acknowledged.

Hypothetical Views aid Expression. Our knowledge of the nerve-processes, although not to be despised, is un-
doubtedly imperfect and leaves a great deal to be desired. Consequently we may not make use of it as a basis of subjective laws, or as carrying us much farther into the arcana of mind than we can go by help of subjective indications. Our analysis of memory, reason, and imagination, cannot be said to be suggested or confirmed by the physiology of the brain. But there is also another side to the case. If a subjective language were in existence adequate to cope with all the nice intellectual situations, we should not be justified in bringing in nerve-processes of a purely speculative kind. There are, however, a number of situations where expression is imperfect, inadequate, and unsteady; and for such situations a merely hypothetical supposition may be helpful, while it need not be abused.

Admitting the necessity of mixing material phraseology in the expression of the mind, we must, of course, observe the precaution of not giving the one as a substitute for the other; but ordinary care is usually sufficient to avoid this error. In the exposition of the mind, not only should this substitution be avoided, but a reasonable proportion should be observed in using the two vocabularies. The best mode of guarding against either subjective or objective excess in the terminology would seem to be to set forth every mental fact, first, under its known physical accompaniments, including convenient hypothetical adjuncts, and, next, in its purely subjective delineation. This done, we can survey the observed proportions and adjust them as we judge best; while it will be open to the critic to take exceptions to any undue fulness or irrelevance on either side.

The objectors to the use of physiological theory in dealing with mental processes dwell chiefly upon the intellectual functions; whereas if they were to attend more particularly to the senses, the emotions, and the will, they would have to change their language entirely. No man will ever discuss these departments without making a very large use of the terminology of the material accompaniments. It is simply a question of greater or less reference; it is not a question of subjective purity of treatment. Aristotle made the first commencement in the way of physical reference; his delineations of the physical side were crude in statement, but he did not err in principle. It is in the detailed exposition of these several departments of the mind that the question may be advantageously raised as to the suitable amount of physiological description in each particular case. The theory of Pleasure and Pain which governs
both the emotions and the will has long adopted a physiological embodiment, and the advocates for subjective purity should say precisely whether this is wholly illegitimate, whether it is excessive, how far it should go, and where it should stop. This may be propounded as a fair test of the sincerity of the subjective purist. In point of fact, it would help to solve what is a genuine problem not as yet solved by anyone, namely, to draw the line between the use and the abuse of physiology in the psychological region.

What I conceive to be inadequate reference to physical accompaniments may be illustrated from Mr. Stout's paper "On the Scope and Method of Psychology" (Proc. Arist. Soc., i. 33). I give a few of his expressions as follows:—

"We must assume that every mental event is connected with a neural event;" "we are compelled to consider these neural occurrences which are immediately connected with mental occurrences, not as antecedent to those, but as concomitant with them." "What then is the value and import for psychological science of those neural accompaniments of mental events? I answer that from a purely theoretic point of view psychology is not bound to take any account of them whatever." "We have, in conclusion, to consider whether it is practically convenient to discard data which may be supplied by the physiology of the brain." "For example, the endeavours which have been made to find a material correlate to the association of ideas do not really advance the science of mind a single step."

My first observation upon these statements is that, under them, the only connexion of mind and body that is proposed to be taken into account is the connexion of mind and brain or the nerves. We should never know from Mr. Stout's observations that mind was accompanied with organs of sense, with organic processes, and with the muscular organs. My next observation is that the use of referring to bodily organs and processes is too much narrowed by his mode of putting the case. I propose to confute this narrowness from his own mouth, but I shall first avail myself of the following sentences from Dr. E. Montgomery (MIND x. 386):—

"Now, as the veritable powers which have established the definite bonds between sensorial affections are themselves extra-mental, it is not likely that we should be able exhaustively to study the laws of perceptual combination by mere mental operations, unaided by experimental reference to the permanent source of stimulation and union which they represent. Who, indeed, finds himself ever thinking of feelings of touch without also calling into mind the organ of touch together with some touched object, or sets about invoking normal muscular feelings as perceptual building-material without presupposing actual muscles?"
This is precisely my contention, and my surprise is that there should be any occasion to make such a very patent remark. I will now quote another passage from Mr. Stout on a purely psychological question, viz., the ultimate distinction of the Primary Mental Functions (*Proc. Arist. Soc.,* i. 142).

"The unity of the individual consciousness seems to depend on the successive salience and dominance of special presentations which constitute in turn the focus of the total mental activity from moment to moment. This is expressed in ordinary language by saying that we can only think of one thing at a time. Now the successive dominance of a single presentation, which gives systematic unity to mental process, depends on motor activity. Out of the multitude of impressions which are continually soliciting our senses, this or that special one is singled out by muscular adaptation of the organs of sense, by vaso-motor action, causing increased blood supply to special parts of the sensitive surface, and perhaps by outgoing currents passing along the sensory nerves from centre to periphery. The concentration of attention on ideas seems to be effected by a similar mechanism. Thus the unity of consciousness, and therefore the very existence of consciousness, depends on the focussing of presentations, and the focussing of presentations depends on motor activity. Hence motor activity is a necessary condition of the existence of consciousness."

It will be observed that the writer of the above, after devoting three sentences to subjective expression, leads off on the concluding phrase "motor activity" into the profuse employment of physiological language which I have here signalised by italics. It seems to me that he is quite right in doing so; that the language he employs is a relevant citation of the physical side of his subjective thesis, and that he has been urged, notwithstanding his theoretical aversion to the physiological reference, to make use of it as somehow assisting his conception of the subjective fact. Evidently, his refusal of physiological assistance was stated too exclusively in terms of nerve and brain, as if these were the only important bodily organs connected with the mind. Thus, to take his testing example—the material correlate to the Association of Ideas—it is perfectly true that the nervous processes accompanying association are very imperfectly known, even if they can be said to be known at all. But this is not a fair statement of the question as to the physical accompaniments of our intellectual processes. Instead of association of ideas, let us put the case of Memory or Retentiveness, one of the fundamental facts of our intelligence, and ask whether our knowledge, such as it is, of the physical accompaniments be wholly irrelevant. Do we in describing the operations coming under this head, such as acquisition
of knowledge, formation of habits, entirely and at all points exclude bodily accompaniments? It is no doubt the case that we largely make use of a subjective terminology, and that we can state the chief conditions of retentiveness by this means; for example, the two great essentials of repetition and mental concentration can be given without making use of physical language. But we very soon come to know, and it always has been known, with more or less precision, that bodily freshness and bodily fatigue play a vital part in the success of our endeavours. Now, while I doubt whether this condition could be expressed subjectively, it is quite certain that it never is so expressed. There are other conditions equally beyond purity of subjective statement. Thus, in order to impress the memory of a pupil with a given exercise, it is very desirable that the teacher's statement should be, in point of articulation, sharp, deliberate, and distinct, while the pupil should have his ears in such a condition of alertness as to receive the statement with effect. These conditions, I contend, are eminently physiological, although not what would be called profound physiology. I repeat, therefore, that the outworks of sense and movement, and the general tone, are to be taken into account on the physical side as much as the more inscrutable recesses of the cerebral convolutions.

I will now turn to Mr. Bradley (MIND xi. 321), who is even more emphatic than Mr. Stout in his assertion of subjective purism in psychology. He is attacking a position almost the same as Mr. Stout in the passage last quoted, viz., the psychical origin and character of Attention or our sense of Activity, and, after discussing the point subjectively, he adverts, in concluding, to the supposed physiological argument that might be adduced by way of confuting his view. This leads him to say what he thinks on any or all attempts to bring physiology to bear upon mind.

"But such a question as the existence of a psychical activity is a matter which falls outside physiology. We might get from that science instruction valuable and, in some particulars, even necessary; but suppose that we knew (as I presume we do not yet know) the physical side of the psychical process, is it certain that about the main question we should not be precisely where we are now? For in the first place the existence of this or that feeling could hardly be deduced from physiological premisses if actual observation were unable to find it. And in the second place between a process in the brain and a consciousness of energy there is really a gulf which is not to be filled up. You may know from experience that they are found together, but, given the first, you could never have got to the second, and they remain in the end quite heterogeneous."
For my own part, I take leave to doubt the irrelevance and the uselessness of all physiological reference in this very question. I venture to think that Mr. Stout followed a sounder instinct, against his own theory, in making free use of physiological terms for substantially the same problem. When we talk of our activity—talk of ourselves as active beings—the first thing that we have to look to is the active apparatus of the body, as known by the name of the muscular system. Every act of bodily attention involves, in the first instance, some specific muscular acts; and when from the sphere of actuality, as in the employment of the senses, we pass to the sphere of ideality, the point is forced upon us whether or not this is still muscular activity in a transformed character. Evidence is adducible for, or against, the hypothesis. So much is to be said in its favour, that the opposite appearances are merely certain remaining difficulties that may possibly or probably be removed. Now when we have carried into the mental sphere our muscular agency under a new guise, we have found a genuine physiological activity, the interpretation of which has a decided relevance upon the psychological discussion. It may not be conclusive, but it is highly suggestive, and is at least an aid to us in stating the problem; and, as is often said, a problem well stated has already gone some way towards being solved. Moreover, if mental attention is not bodily attention idealised by being thrown more exclusively inward upon its nervous tracks, there is still to be sought within the compass of the system a factor of activity at present entirely unstateable. We cannot too soon set going an inquiry to find out what this is.

To meet the challenge, so often made, to produce any laws of connexion between the physical and the mental such as to throw light upon the workings of mind, I will refer more particularly to the Feelings and the Will, where the most conclusive illustrations can be adduced.

We cannot do better than advert to the great thesis of Pleasure and Pain, as such, with their results in determining volition. On this subject Mr. Bradley has an exceedingly elaborate and exhaustive paper (Mind xiii. 1), to which I will at present refer no farther than to take note of his mode of handling the undoubted and well-known physical accompaniments of our hedonic states. I venture to suggest that, if he adhered strictly to the view formerly quoted, he would never mention the physical side at all; or at least he would justify the use he makes of it, and admit that psychology,
on certain occasions at least, does well to bring in the aid of physiology. The example may be taken as a testing case of the employment of physiology, and as an opportunity of judging whether it is profitably or unprofitably cited.

Pleasure and pain are without doubt psychical states, and may be studied or contemplated purely as such. But when we wish to theorise upon them, so as to give a full account of all their important bearings, we find ourselves obliged very soon to advert to their physical causes or conditions. Thus, Mr. Bradley, while opening with a purely psychical inquiry, viz., as to the connexion of pleasure or pain with Sensation, and with the Ego, proceeds to ask for their physical conditions. He discusses, and considers the discussion legitimate, how far pleasure corresponds with physical benefit and pain with physical injury. Then he inquires what are the strictly psychical conditions of pleasure and pain, i.e., their connexion with psychical activity. His conclusion is, that there are conditions that are not psychical, as well as those that are. His most comprehensive conditions, which he develops at length, are harmony and expansion, which conditions he traces throughout in their double aspect of the physical and the psychical. In all this, I regard him as on the right tack; and I accord to him the further compliment of keeping the two sides distinct and apart in the course of his whole discussion, thereby complying with what I consider the chief propriety to be enjoined in the handling. So far he has done all that I have ever contended for, in regard to the inclusion of a reference to the physical side. Yet, even on psychical grounds, I believe he ought to have greatly widened his basis of examples of pleasure and pain. On the one hand, he should have dwelt more fully on the primary feelings connected with sensation, as well as the more elementary emotions; and on the other, he should have expounded more fully the higher aesthetic and other aggregates of emotion. His choice of examples is not even fairly representative of the difficult cases. It is not my purpose to enumerate those deficiencies at length, but the present argument makes it proper to cite one notorious department of our pleasurable and painful sensibility, I mean the region of stimulating drugs—alcohol and the rest. No one can enter upon the mode of action of these drugs without being thrown at once upon physical considerations. That they are physicochemical agents affecting the constitution of the substance of nerves, and in that capacity bringing about mental exhilaration, is sufficiently plain, although the minute atomic changes are not precisely formulated. These drugs teach us
by a startling example, which many other facts contribute to support, that the physical constitution of the nerve-substance is a paramount condition of our sensibility, pleasurable or painful. The nourishment, exercise, exhaustion, depletion, chronic deterioration, of the brain, as a physical and chemical compound, form a body of received doctrine, both theoretical and practical, which no amount of squeamishness as to neural accompaniments to psychical processes will ever displace from the hold it has gained. Moreover, the dependence thus established by the leading example of stimulants and their consequences will suggest the application of the chemical view to such cases as the sweet and bitter in taste, as at least of equal value with any of the other hypotheses.

I propose now to widen the issue, so as to make the illustration of the use of the physical side more comprehensive, thereby vindicating its importance for the purposes already stated. The lowest step in the gradation of its employment is perhaps simple parallelism of psychical and physical processes without obvious advantage to either. Where a psychical region can be fairly and fully analysed by psychical introspection, we might rest contented, and say nothing of physical accompaniments. Still, there is a certain satisfaction in being able to assign, at the same time, a concurrent series of physiological organs and processes, and it is a matter of choice whether or not we care to have these added. Perhaps the Reflex Operations of the mind might be quoted as a case in point; it being possible to classify and describe those processes, not certainly without physical references, for they all consist more or less of conspicuous bodily movements, but without special reference to the nerve-centres that are their known seats in the cerebral system. I will not argue this point further, but will go on to less equivocal examples.

The sensations of the Special Senses have been already referred to. They are of course very numerous, very distinct, and all-important both for Feeling and for Intelligence. They constitute a vast psychical mass, which we might study on the purely psychical or introspective side. We might, in the interests of purism, refuse to take any notice of the bodily organs that are associated with them. Can any one point out what would be the positive gain of this affectation of purism? It is much more easy to assign the loss. By taking the physical organs in separation, we can, in the most compendious manner, exhaust the modes of
sensibility under each, and can thus arrive at a wide and orderly view of this great multitude. Nay more: when we look minutely into the anatomy of the several organs, we obtain further help to the subdivision and distinction of the individual sensations. By tracing tactile nerves in the tongue and in the nostrils, we discriminate the feeling of tactile pungency from the characteristic sensibilities of taste and smell.

The special senses further exemplify the utility of the physical side as a handle to the mental. We have already seen the difficulties in obtaining an adequate subjective vocabulary for the immense detail of our psychical experience. For this vocabulary, the physical accompaniments are largely invoked and are found to answer the end. In connecting the special senses with their several organs, we are under no temptation to confound mental and physical facts, while the physical fact helps us to realise, to retain, and to reproduce, the mental. We distinguish the two great elements of visual sensibility by the muscular and the retinal portions of the eye; and no conceivable harm arises from thus intruding the purely material adjuncts of our vision. It is needless to pursue the illustration. Usage has lent its all-powerful confirmation to the combination of the mental and the physical in this part of the mind.

We will next cite the Organic Sensations, touched on already, as being still more forcible in argumentative value for our general thesis. Here we have an enormous mass of sensibility, affecting profoundly our entire well-being. Psychically, there is not here the same easy discrimination of the different kinds as in the five senses. Yet, the distinguishing and classifying of these sensibilities make an important part of mental science, and yield the greatest practical consequences. Now, without the clue that a knowledge of the several organs furnishes, such an analysis must needs be very imperfect. In point of fact, all the attempts to make the discrimination have been more or less guided by the connexion with distinguishable organs. The stomach and the lungs perhaps take the lead in giving distinctness to the departments of sensibility associated with each. The muscular system, viewed as an organ liable to changes in nourishment, fatigue, exhaustion, physical injury and derangement, has also a distinguishable class of sensibilities.

The reference to the Muscles opens up the much discussed question of the physical side of our subjective sensibility to pressure, strain, and active exertion in every form. This
case is illustrative, in a way of its own, of the value to be attached to the study of physical concomitance in mind. It so happens that, in this region, the subjective analysis is self-sufficing, that is, independent of hints or confirmation from the physical side. It will probably be admitted by all the disputants on such a well-threshed question, that subjectively we can establish as distinguishable modes of consciousness the following series of states of feeling:—Sense of energy expended, pleasure of muscular exercise, pain of fatigue, pleasure of repose, pains of morbid states, as cramp, not to speak of minuter variations of those leading modes of sensibility. Now, working upon the usual analogies of the senses, where we can generally assign to each important variety of sensation a local seat, there would be a propriety in assigning some distinct mode of stimulating muscle to each of the several classes now enumerated. One hypothesis connects the sense of energy with the out-going motor current; while the pleasures and pains of exercise and repose, which can be best viewed as passive sensation, would accompany the in-going sensory current through the sensory fibres of muscle; to these might be added any known adjuncts of sensation from the peripheral parts involved in muscular action. There would be a certain congruity with the subjective facts in this mode of assigning the concomitance; yet its verification would not add to the evidence of our subjective analysis, and its overthrow would not impair the validity of that analysis. We cannot quote this instance as even particularly illustrating the use of a physical hypothesis in supplying subjective expression. We derive all the benefit of the physiological reference by using such objective terms as muscle, motion, action, rest, without committing ourselves to the concomitance of our feeling of energy with the out-going current.

The powerful influence of changes of Temperature would have to be adduced in an exhaustive rendering of our organic sensibilities. While the feelings connected therewith are of the most commanding kind, the physical concomitance is too palpable to be ever overlooked; and whatever contribution physiological researches may make towards explaining its mode of action throughout the body, will be adopted by the psychologist in his rendering of the subjective states.

Under this same head we need to adduce the nervous substance at large, which, in its own nature, goes through all the phases of nutrition and exhaustion, exercise and repose, health and disease, integrity and injury. No doubt the organs of nutrition and purification generally are concerned in maintaining the good condition of the brain and nerves,
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with all that depends upon these. Still it is possible to assign mental states in more direct connexion with the nervous substance as such, while it would be impracticable to conduct the analysis without assistance from what we know of the physics of nerve. In spite of the mingling of all the organic functions in the general physical tone of comfort or discomfort, elation or depression, there is no mistaking the characteristic sensibilities of the stomach, the lungs, or the muscles, and to a certain extent, the brain and nerves also. We do not need at this stage to penetrate the deeper arrangements of the cerebral centres, their nerve-plexuses, and complicated distribution of nerve-fibres; all this remains over as a distinct inquiry, to be judged apart.

Connected with the physics of the brain is the important state designated under the name excitement, with its opposites quiescence, languor, repose, drowsiness, sleep, and insensibility. With all this mental gradation, there is an accompanying physical gradation, which can be expressed in physical terminology, and cannot be adequately stated without that help. The physical symptoms are prominent and conspicuous to the eye of the observer, and are part and parcel of the received modes of stating and conceiving the mental facts. We know the organs and processes that participate with the brain-action in the various degrees of conscious intensity. In ignoring these, we should lose much and gain nothing. In fact, if we were prohibited from noting the physical aspects of this department of sensibility, we should surrender the study of it altogether, at least as a branch of psychology.

Inseparable from sensation is the general discussion of Pleasure and Pain (to which I have already adverted in another connexion), although the thesis must be considerably widened in order to attain its full compass in the mind. At what point, or in what connexion, it should receive comprehensive discussion is a matter for consideration, and may be decided in different ways. What we are here concerned with is the well understood connexion between known physical processes and a very large number of both pleasures and pains. I have already had occasion to allude to this involvement, and have noticed how unavoidable is the introduction of the physical side in anything approaching to a thorough investigation of the most general laws of our sensibility in this respect. I will now carry the illustration a step farther by citing the theory of the Will, in which Pleasure and Pain operate as the motives, and our muscular organs
as the instruments. It is true that a very large portion of
our voluntary activity can be stated in an almost purely sub-
jective terminology. This, however, does not apply to the
overt forms of voluntary action, which are the essential fore-
runners of the deeper modes where subjectivity is most
fully exemplified. We may, at this stage, leave out the
physical side of the pleasure or pain that is the motive, but
the resulting activity is physical or nothing. Now the
theory of the Will may be a subjective theory to this extent,
that we may simply state as generalised facts that Pleasure
moves us in one direction (viz., for its own conservation or
increase) and Pain in another direction (viz., for its removal
or abatement). This is to confine ourselves to strictly subjec-
tive affirmations. We may, by full examination of facts,
improve upon these generalities as so stated; we may add
to their precision in every way by needful qualifications and
limitations, so as to meet the various complications of the
problem. All this is proper to be done, and ought, on no
account, to be dispensed with. There is, however, a physi-
cal aspect that may also be entered upon, but should not
be jumbled up with the other aspect. It should be given
quite apart, and have its value put to the test, according to
the requisites imposed upon physical theories.

The kind of speculation now supposed would consist in
seizing hold of pleasure and pain by their known physical
aspects, and inquiring whether, physiologically, there is any
natural sequence between those and the activities that follow
on pleasure and pain as disclosed by subjective introspec-
tion. For example, if pleasure is associated with the fur-
therance of vital energy and pain with its depression, there
would be a physical link between pleasure and increased
activity, and between pain and the failure or diminution of
activity. This is a hypothesis and nothing more. It may
be shown to have a certain range of application, while it
has apparent and obvious shortcomings. The question may
fairly arise in connexion with such a hypothesis—does it
amount to an abusive application of the physical side? I
think not, if due precautions are observed. I admit that the
theory of the Will must rely, in the first instance, upon
subjective sequences. In the settlement of these we should
scour at large over the wide region of subjective experience.
We should be able to present an unbroken array of purely
mental instances, as it is possible to do without further
allusion to the physical than is required by the character
of the active instrumentation. When all this is done, it
is open to us to see whether a concurring line of physical
causation may be assigned for any portion of the facts. It is perfectly clear that, for this region at least, the psychical is the fact most immediately within our comprehension. The physical on the other hand is hazardous and hypothetical, but perhaps not entirely without relevance. Even if only a link here and there is fairly assignable, yet if that link has anything to be said in its favour it may chance to aid in settling some of the doubtful transitions in the psychical series. We cannot know this till we try: the attempt is worth making; and, if it fails, we simply remain where we were. One advantage at least may be claimed for this and for every other like attempt, viz., that it keeps us fully alive to what is involved in a physical hypothesis, shows us the propriety of reserving its consideration, and consequently of carefully excluding every item of the physical from the psychical study. This in itself is no small advantage. Not only so but it is the sole conceivable method of avoiding the muddle that the purists complain of.

The problem of Evolution has now found a locus standi in science generally, and in physiology and psychology particularly. Although but a hypothesis, it is a hypothesis that has thrown its fascination over scientific inquirers. It crops up everywhere in connexion with the mind, and with the region of Will in a prominent fashion. The physical consequences of pleasure and pain are a two-fold activity—Expression and Volition. It is debated whether, in evolution, expression be prior, and volition posterior. For the more practical uses of psychology the speculation is unimportant; it ranks in value with the analyses of Space, Time, Cause, Unity, &c., into their psychological elements and beginnings. Now, for verification of any hypothesis as to priority between the two forms of the physical outcome of feeling, introspection is powerless. The sequence must be taken on the physical side alone, and so, in point of fact, is it argued, by Darwin for example, in favour of Volition. And if the evolutionist, after assuming this priority, were to go a step backward, as he is bound to do, in order to fill up a gap in the grand sequence of cosmical cause and effect, he must proceed upon physical connexion exclusively. The hypothesis now adduced is one among others in this direction.

Next, as regards the Emotions, taken in themselves, the tracing of physical concomitance is unavoidable, and is seldom evaded. Indeed, when bringing forward the more
fundamental and elementary emotions—Fear, Love, Anger—the physical signs are too manifest to be overlooked; it is only when emotion is highly idealised and compounded that we discard such references, and treat the case by subjective methods alone. This, however, is too absolutely stated, if we take account of the handling of emotion in Art. And even in the strictest scientific analysis, the physical expression, so manifest in the primary modes, although refined and attenuated, is still discernible and suggestive in their combinations. The laws that regulate the rise, concurrence, conflict, and subsidence of emotion can be traced subjectively; while their physical embodiment, being also known, passes through phases of physiological cause and effect, which serve to confirm and correct the introspective inductions. Whether avowed or not, inquirers do not scruple to go through the double sequence, so as to make the two sides mutually illustrative.

The recent researches in Psychophysics call for some remark, though they may be said to speak almost for themselves. The experiments are made upon the physical side, but not to the exclusion of subjective reference; in fact, they are experiments of concurrence or concomitance in order to ascertain general laws of concomitance, and to derive whatever benefit may be obtainable from the attainment of such laws. We cannot refuse to these researches the merit of satisfying an enlightened curiosity, if nothing further; which, indeed, is the sole justification of a very large amount of our most highly patronised researches. But if such researches were to attain anything like precision in their object of determining laws of concomitance, they could hardly fail to assist us in clearing up subjective sequences; at any rate, they would help to steady and confirm, and most decisively to express, the sequences indicated by pure introspection. As now conducted, these researches are more and more pressed into the service of every one of these ends, and admit of being criticised accordingly. No psychologist would discuss the Senses without taking notice of Weber’s experiments on Touch—a line of investigation since exemplified in every one of the senses.

It is a well known fact that any form of muscular activity that we happen to be engaged in is arrested by a sudden mental diversion. We cannot easily carry on mental work and bodily work at the same instant. This is formulated on its physical side by Dr. Ferrier in these terms:—“The internal diffusion of nerve-energy involved in thought, and
the external diffusion of it in muscular action, vary in an inverse ratio”. The grounds of the principle are physiological; the results have to be stated psychologically, seeing that they regulate the course of our inmost thoughts.

The “rhythm of Attention,” or the intermittent character of mental exertion, is a very great fact of the system, and its precise elaboration and definition can be best approached from the physical side, as in the psychophysical laboratory. The position is emphasised by Herbert Spencer that “nerve is not capable of continuous stimulation or continuous discharge”. Otherwise put, “the so-called nerve-current consists of successive pulses”. The alternate remission and recuperation of our active energies, as embodied in muscle and nerve, is a physical law with psychical consequences in every region of our mental being. Whoever would see a full development of this law, as well as a fruitful rendering of the thoroughgoing concomitance of Feeling and Nerve-change should peruse Mr. Spencer’s Psychology, more especially pt. i. Indeed the whole work is a sustained testimony to the propriety, if not the absolute necessity, of carrying physical concomitance into every portion of our mental nature.

There is one great law connecting Sense with Intellect, which has everything in its favour, and, so far as I know, nothing against it. If we reckon it still as but a hypothesis, it is one of very great probability. It relates to the seat of ideas obtained in the first instance through the senses, and declares the nervous tracts to be the same in both. There may be slight qualifications to the principle, but nothing to affect its substantial correctness. If there were no other law of nervous concomitance with intellectual function, this alone would redeem the search for neural accompaniments from superfluity or futility. The psychical bearings of the principle are most important, it being as yet the only key to facts of hypnotism. I need only refer to the adoption of it in that view by Edmund Gurney. Of course, neither this nor any other such law should be overstrained, or regarded as absolute. For one thing, a difficulty may be started to the effect that we may be thinking of one image and looking at another, thus causing a conflict of internal nerve-currents. The difficulty will no doubt have to be met, and, in meeting it, the principle will be either confirmed or modified; indeed, some progress has already been made in this direction.

Another great physiological truth affecting our mental operations universally, and likely to supply the explanation
just desiderated, is the need of a motor response to sensation in order to full consciousness of the state. This condition seems to grow out of the very structure of the nervous system, and has all the universality that we should expect in consequence. In a recent article in Mind (xii. 490), Dr. Maudsley illustrates this position with a fulness and a pointedness that dispenses with repetition in this place. To ignore the physiological truth is wilfully to blind ourselves to psychical helps. I have already had to advert to this condition in a previous page. It is dwelt upon with special emphasis by Dr. H. Münsterberg, as a guiding principle of his researches; my only doubt is whether he is not overstressing it. It is, however, enough here to quote it as a telling example of a really luminous physiological concurrence not to be neglected by any psychologist.

To come back again to the transition from Sense to Intellect: it has been always impossible to avoid describing ideas as modified repetitions of sensation, and employing for that purpose the materialism of the sense-organs. The language of thought—image, picture, idea, trace—is a proof of this origin. Whether accurate or inaccurate, expression demands such references. What is more: in order to state to ourselves the existence of sensible impressions and other results of thought when out of consciousness, we need a bold resort to material processes. When occupied with some present sensation, we are aware—and nobody has ever denied or thought it proper to ignore the concurring nervous processes, so far as inferrible—that nervous currents are proceeding from the sense-organ inwards to the nerve-centres, and ultimately reaching the brain-cortex, with responses in the shape of muscular stimuli. Let now the attention be transferred, let an entirely new and distinct sensation occupy the consciousness, and what becomes of the nervous agitation of the previous moment? It might be like the waves of a pool disturbed by a stone, persisting for a time and then ceasing for good. This, however, cannot be the case. For a sensation that has once occupied us for a time, while by a change of attention it is made to vanish, is found capable of recurring as an idea once and again in the same hour, or the same day, or even fifty years afterwards. Now, it is forced upon us, as a query if nothing more, Where are those sensations when out of consciousness? We want at least a language-aiding hypothesis to enable us to conceive what gives no sign of existence. The usual resort has been a very gross and imperfect metaphor—the 'store-house' or 'receptacle' of memory—material enough in all conscience, but very
defective as a psychological statement. Well, without pretending that we can verify any one view of the arrangements and processes of the nervous system that are the physical support of memory, we cannot help craving for some hypothesis, as far as the lights of physiology will carry us. We do not find that such hypothesis leads to any perversion of the psychical facts; while it need not be rated beyond what it is really worth, viz., a help to expression. Its value does not necessarily stop there; we may be led by it to canvass facts of mind on the one hand and of body on the other, so as to confirm or confute it, and ultimately replace it by something better.

The physical conditions of Consciousness in general have been much studied of late, and the results have been on the whole decisive and valuable. They have been recapitulated with additional illustrations in Dr. Maudsley’s article just alluded to. There would be no assignable gain to psychology by blotting out all these speculative inquiries, based as they are upon accessible and well-ascertained facts. Importance is justly attached to the limitation of the conscious area, and the reasons of that limitation can be stated physiologically with even more precision than psychologically. In the latter view, all we can say is, that we attend only to one thing at a time, which is not true except under qualifications; and, in stating these, physiology is our greatest help. The more general conditions of conscious wakefulness, as opposed to the unconscious modes of languor, sleep, swoon, as already remarked, are pre-eminently related to the science of mind proper. The decline and cessation of consciousness in certain operations that are properly mental, as in the consummation of habit or routine, is an important item in psychological theory.

If we advert more particularly to the abuse of the physical side, we can easily see what it must consist in, now that we have surveyed the various examples of the use. It is, of course, abused when it is unnecessary, and, still more, when it is mischievous. But the point is, what are the circumstances that render it mischievous as well as unnecessary? While eminently applicable to all the phenomena of mind at their elementary stage—Sensation, Intellect, Emotion, Will—it ceases to have the like bearing in the higher complications; that is to say, it cannot be assigned with precision, or even with suggestive hypothesis. Taking, for example, the Emotion of Fear in its most elementary form, the physical accompaniments are both assignable and sug-
gestive. The same might be said of the Tender Emotion, and of Resentment or Malevolence, but in a compound of these with one another and with a mass of intellectual association, it would be a mistake to trace physical workings beyond the inevitable consequences in outward expression and in voluntary action. The analysis of the Sublime, for example, is rightly conducted on exclusively subjective lines. In the discussion of Consciousness at large, no one would appeal to purely physical accompaniments. All this leaves to the introspective inquirer by far the largest portion of our mental constitution. Thus the question as to physiological conditions is still a comparatively small part of a well-developed system of psychology.

As regards Intellect proper, we have seen the importance of indentifying the nervous tracts of ideas with the tracts of the corresponding sensations. But, now, if we recur to the test-example of physiological aid in clearing up mental processes, viz., the Association of Ideas, our final decision upon it must be to the following effect. In all that part of Association that states the order of recurrence of our ideas in Memory, subjective investigation is paramount and exclusive. Moreover, it is eminently efficient for the purpose in view. The important circumstance in our intellectual trains is the fact that they repeat the objective world, where our mental grasp is at its utmost, and disclose the laws of their order with facility and precision. The first really acute thinker that rose to a statement of the question—Are there laws of sequence in our ideas?—could scarcely fail to discern these laws nearly as we now have them. Introspection is alone equal to this task; physiology has no part in it now, and in all probability never will. The highest conceivable advances in our knowledge of nervous processes and arrangements could only give a very imperfect rendering of either Contiguous Association or the Attraction of Similars. So much for one aspect of the problem.

There is, however, that other aspect whereon I have already dwelt. While the laws of order of recurrence of thought are fundamentally unalterable, they are qualified by a condition, or set of conditions, which are stateable not merely as psychical facts but as physically conditioned; and if so, physical conditions play a concurring part not to be ignored. The state described by a variety of names—Conscious Intensity, Excitement, Mental Concentration, Attention, Interest—is expressible both subjectively and physiologically. Even with our present knowledge the physiology of the state is important and suggestive, and future researches may add
to its precision and its helpfulness as a guide in practice; while our subjective study has probably even now reached its culminating point. This, then, is the answer to the challenge as embodied in the instance of Association.

It is manifestly an abuse to give a physical link as the substitute for a psychical or mental. The mistake is not often made in reality. When an orator in the House of Commons objects to the union of two principal State-offices, as too much for one brain, he is not necessarily a materialist; he merely uses the acknowledged dependence of mind on brain as a figure of metonymy to make the statement more impressive. Once grant that every one of our mental processes has its physical concomitant, and there is no need, and no temptation, to make the physical take the place of the mental except in the figurative way.

Whether a professed psychologist—teacher or writer—gives up too much of his exposition and investigation to purely physical incidents, is a matter solely of the proprieties of his position. Every expositor is apt to give an undue preference to one part of his subject; while some teachers pay too much attention to the physical, others pay too little. The most ambiguous position of any is the statement of those instances where there is a manifest assignable concurrence of physical and mental without any obvious mutual lights or reciprocal gain. It may be said that a physiologist should not trouble himself with psychical accompaniments that suggest nothing physiologically and vice versa. Such cases, and no doubt there are such, may be said to fall between two stools, and deserve to be neglected or discarded. What remains to be said for them is simply the gratification of intellectual curiosity, together with a contribution to the establishment of the universal law or bond that unites the mental and the physical. One instance in point—the Reflex Operations—has already been adverted to. We may, however, adduce the far more striking example furnished by the researches of Ferrier and others on Cerebral Localisation. A considerable amount of scientific interest has been aroused by these laborious inquiries; but they have added nothing to the explanation of our intellectual workings, while in Physiology the interest is purely theoretical. Possibly, they may be the beginning of great results on both sides; but if we were to insist on the ideal of the subjective purists we should make no mention of them in Psychology proper.
One extremely important aspect of the union of Mind and Body is presented by the circumstance that has received prominence only in later times, that we are constantly applying spiritual remedies to bodily ailments, being often unaware of what we are doing. This ignorance is not so frequent now as it was in former times; we are becoming gradually more disposed to employ physical treatment for purely physical maladies. It is the fact that depression due to physical causes may be more or less removed by applications of an intellectual or moral kind; as when a sufferer from illness is cheered by the sympathy of friends. On the other hand, a blow of a purely mental nature can be sometimes effectually met by a physical tonic. The interaction of the two sides of our being in those instances has very great significance. There should, however, be no mistake about it. We should understand that the first and most direct and efficient remedy for physical derangement is physical treatment; and so with the mental: "Rachel, weeping for her children, and would not be comforted, because they are not". When we fail to remedy each mode by its own kind, we may properly make trial of the other kind, and may have a partial success. What we need is to appreciate exactly the case that we have to deal with, and to ply the most suitable weapons at our disposal. Past history records a long series of mistaken renderings of human misery with a corresponding misjudgment in the choice of remedies.